

THE LAMBARÉNÉ-ORGAN-DYSFUNCTION SCORE (LODS) IS A SIMPLE CLINICAL PREDICTOR FOR FATAL MALARIA IN AFRICAN CHILDREN

Raimund Helbok¹, Eric Kendjo², Saadou Issifou², Peter Lackner³, Charles R. Newton⁴, Maryvonne Kombila⁵, Tsiri Agbenyega⁶, Klaus Dietz⁷, Kalifa Bojang⁸, Erich Schmutzhard³, Peter G. Kremsner²

¹Medical Research Unit, Albert Schweitzer Hospital, Lambaréné, Gabon; Innsbruck Medical University, Clinical Department of Neurology, Austria, ²Medical Research Unit, Albert Schweitzer Hospital, Lambaréné, Gabon; ³Department of Parasitology, Institute of Tropical Medicine, University of Tübingen, Tübingen, Germany, ⁴Innsbruck Medical University, Clinical Department of Neurology, Innsbruck, Austria, ⁵Centre for Geographical Medicine, Kenya Medical Research Institute Kilifi, Kilifi, Kenya; ⁶Neuroscience Unit, Institute of Child Health, University College London, London, United Kingdom, ⁷Department of Parasitology, Mycology and Tropical Medicine, Faculty of Medicine, University of Health Sciences Libreville, Libreville, Gabon, ⁸University of Science and Technology, School of Medical Science, Kumasi, Ghana, ⁹Department of Medical Biometry, University of Tübingen, Tübingen, Germany, ¹⁰Medical Research Council Laboratories, Banjul, Banjul, Gambia

Plasmodium falciparum malaria accounts for more than a million deaths annually, mostly among young children in sub-Saharan Africa. Identifying those who are likely to die is difficult. Prior studies suggested that quantitative scores (Multi-Organ-Dysfunction Score and simplified Multi-Organ-Dysfunction Score, MODS and sMODS) are useful markers predicting morbidity, but the cohorts were not large enough to detect an association with case fatality. We used stepwise backward logistic regression to select the best predictors out of nine variables evaluated on admission to predict death in 23,800 hospitalised children with *P. falciparum* malaria. The study was conducted from December 2000 to May 2005 in six hospital-based research units (Banjul in The Gambia, Blantyre in Malawi, Kilifi in Kenya, Kumasi in Ghana and Lambaréné and Libreville in Gabon) in a network established to study severe malaria in African children (SMAC). The Lambaréné-Organ-Dysfunction-Score (LODS) counts how many of the three variables coma, prostration and deep breathing are present. A LODS > 0 (OR = 9.6; 95%CI 8.0-11.4) has a sensitivity of 85% to predict death and a LODS < 3 is highly specific for survival (98%). The LODS is a simple clinical predictor for fatal malaria in African children. This score provides a sufficiently accurate and rapid identification of children needing either referral or increased attention.

SULFADOXINE-PYRIMETHAMINE VERSUS UNSUPERVISED ARTEMETHER-LUMEFANTRINE VERSUS UNSUPERVISED AMODIAQUINE-ARTESUNATE FIXED-DOSE FORMULATION FOR UNCOMPLICATED FALCIPARUM MALARIA IN BENINESE CHILDREN: A RANDOMIZED EFFECTIVENESS NON-INFERIORITY TRIAL

Jean-François Faucher¹, Agnes Aubouy¹, Adicat Adeothy¹, Justin Doritchamou¹, Hortense Kossou², Hyacinthe Amedome³, Achille Massougbodji⁴, Michel Cot⁵, Philippe Deloron⁵

¹IRD, Cotonou, Benin, ²PNL, Cotonou, Benin, ³Ministry of Public health, Cotonou, Benin, ⁴FSS, Cotonou, Benin, ⁵IRD, Paris, France

In order to measure the potential impact of the 2004 malaria treatment guidelines in Benin that recommend ACTs (artemisinin-based combination therapies: artemether-lumefantrine as first line therapy and amodiaquine-artesunate as second line therapy) in the management of uncomplicated malaria in young children, we conducted an open randomised non-inferiority trial to compare the effectiveness of sulfadoxine-pyrimethamine (SP) to unsupervised artemether-lumefantrine (AL) and to unsupervised amodiaquine-artesunate fixed-dose formulation (ASAQ). The trial took place in southern Benin in children aged 6 to 60 months with fever or a

history of fever, and a 6-weeks follow-up was performed after treatment. The primary objective was a comparison of day 28 PCR-corrected effectiveness rates. 240 children (48 SP, 96 AL and 96 ASAQ) with a mean age of 26 months were randomized from May to October 2007. Before PCR correction, the intention to treat (ITT) analysis (239 patients) showed day 28 effectiveness rates of 20.8%, 78.1% and 70.5% with SP, AL and ASAQ respectively. After PCR correction, day 28 ITT effectiveness rates were 27.1%, 83.3% and 87.4% respectively. The per protocol analysis (217 patients) showed day 28 effectiveness rates of 21.7%, 88.0% and 76.1% with SP, AL and ASAQ respectively. After PCR correction, day 28 effectiveness rates were 28.3%, 94.0% and 93.2% respectively. Comparisons of SP with ACTs were highly significant in any case, whereas there was no significant difference between AL and ASAQ in the PCR-corrected analyses. The rate of new infections was significantly higher in children treated with ASAQ compared to those treated with AL. Two children treated with SP had to be hospitalized for severe anemia. There was no difference between treatment arms in terms of incidence of adverse events. No severe adverse event was related to a study drug. The potential impact on malaria morbidity and mortality of the replacement of SP by ACTs in this study area could be highly significant.

RISK FOR SEVERE DISEASE IN ADULTS WITH FALCIPARUM MALARIA

Geoffrey Pasvol¹, Anastasia Phillips², Paul Bassett², Sebastian Szeki², Stanton Newman³

¹Imperial College London, Harrow, United Kingdom, ²Northwick Park Hospital, Harrow, United Kingdom, ³University College London, London, United Kingdom

We conducted a clinical study of malaria acquired worldwide in adults in a non-endemic country over a 16 year period to determine risk factors for severe *Plasmodium falciparum* malaria. All patients managed by our unit from 1991 to 2006 with confirmed malaria were prospectively evaluated. Factors predicting disease severity according to a) strict World Health Organisation (WHO) criteria, b) a composite measure of unfavourable outcome and c) length of hospital stay, were identified through logistic-regression analysis. We evaluated 676 episodes; 482 (71%) due to *P. falciparum* and 194 to non-falciparum malaria. Black patients were at significantly reduced risk of developing severe disease, an unfavourable outcome or prolonged stay in hospital compared to Asians or whites. Of six patients with falciparum malaria who died, none were black. Patients with parasitemias $\geq 2\%$ had odds of severe malaria of 12 times higher than patients with $< 2\%$ parasites. Patients with a history of previous clinical malaria, regardless of ethnicity, were at significantly reduced risk of WHO-definition severe malaria. Ethnicity and parasitemia are important independent risk factors for severe falciparum malaria while a history of previous malaria significantly reduces the risk of severe disease (WHO Criteria). These results have important implications for management guidelines in non endemic countries.

1193

ASSESSING THE CARDIAC EFFECTS OF ARTESUNATE (AS) AND AMODIAQUINE (AQ) IN HEALTHY VOLUNTEERS IN A SAFETY AND PK, SINGLE DOSE, RANDOMISED, TWO PHASE CROSS OVER STUDY OF A NEW FIXED DOSE AS/AQ COMBINATION AND LOOSE AS + AQ

Walter Taylor¹, Mohamed Suhaimi², Siew Gab², Suresh Ramanathan³, Sharif Mansor³, Michel Vaillant⁴, NW Sit³, Piero Olliaro⁵, Jean-Rene Kiechel⁶, Viswerwaran Navaratnam³

¹Oxford University, Hanoi, Vietnam, ²Universiti Sains Malaysia, Kubang Kerian, Malaysia, ³Universiti Sains Malaysia, Penang, Malaysia, ⁴Centre for Health Studies, Luxembourg, Luxembourg, ⁵WHO/TDR, Geneva, Switzerland, ⁶DNDi, Geneva, Switzerland

Evaluating QT prolongation as a risk marker for Torsades de Pointe ventricular tachycardia is an essential step for registering new drugs. AS and AQ are well established, antimalarial drugs but have few cardiac data. AQ may be cardiotoxic in overdose. In a randomized, two phase, pharmacokinetic and safety, cross over study, healthy Malaysian adults received fixed-dose AS/AQ (200 + 540mg) and loose AS+AQ (200 + 600mg) 60 days apart. ECGs were performed at baseline, 1h, 2h, 4h, 24h, Day 60 and repeated at cross-over. The QT interval was corrected using the Fridericia formula (QTcF). Analysis was by ANOVA for repeated measures. There were no statistically significant differences between the two arms regarding the PR, QRS and QTcF intervals over time. The baseline QTcFs were 396 (±18) ms for both arms. Mean QTcF (AS+AQ) increased significantly at 2h (7±13 ms, p=0.018) and 4 h (7±11 ms, p=0.008). The only significant change for AS/AQ was a decrease (p=0.013) in the QTcF on D60: -14 (-25 to -4) ms. Post baseline, most volunteers had normal QTcFs despite increases or decreases in the QTcF. Only one (male) volunteer had a 'flag' QTcF of 456 ms (AS/AQ +4h, phase 2). Changes in the PR (maximum values = 206 to 211 ms, n=2) and QRS (maximum values = 122 and 127 ms, n=2) intervals were modest. Heart rates were normal during both phases and trended down over time. The ECG interval changes were small and transient, consistent with natural variation and regression of the mean. PK ECG analyses will be done to determine if a drug effect may be present.

1194

INTRAVASCULAR HEMOLYSIS: A NEGLECTED MECHANISM OF NITRIC OXIDE QUENCHING, ENDOTHELIAL DYSFUNCTION AND IMPAIRED PERFUSION IN SEVERE FALCIPARUM MALARIA?

Tsin W. Yeo¹, Daniel Lampah², Emiliana Tjitra³, Retno Gitawati³, Enny Kenangalem⁴, Kim Piera¹, Bert Lopansri⁵, Don Granger⁵, J Brice Weinberg⁶, Ric Price¹, David Celermajor⁷, Stephen Duffull⁸, Nick Anstey¹

¹Menzies School of Health Research, Darwin, Australia, ²MSHR-NIHRD Research Program and District Health Authority, Timika, Papua, Indonesia, ³National Institute of Health Research and Development, Jakarta, Indonesia, ⁴MSHR-NIHRD Timika Research Program and District Health Authority, Timika, Papua, Indonesia, ⁵University of Utah, Salt Lake City, UT, United States, ⁶Duke University, Durham, NC, United States, ⁷University of Sydney, Sydney, Australia, ⁸University of Otago, Dunedin, New Zealand

Hemolysis of infected and uninfected red cells has long been recognized as a significant contributor to malarial anemia, but has not been thought of as a contributor to endothelial dysfunction and activation in severe malaria. In sickle cell disease, hemolysis causes quenching of endothelial nitric oxide (NO) resulting in pulmonary hypertension and endothelial activation. We hypothesized that similar to other hemolytic states, cell free hemoglobin from red cell hemolysis would contribute to quenching of nitric oxide and endothelial dysfunction in severe falciparum malaria. Plasma hemoglobin was measured in adults with moderately severe (n=78) and severe malaria (n=49), and in healthy controls (n=23), and was related

to endothelial function measured using reactive hyperemia-peripheral arterial tonometry (RH-PAT, a measure of endothelial NO bioavailability). Linear regression was used to relate concentrations of plasma hemoglobin with malaria disease severity, lactate, endothelial function and plasma histidine rich protein-2 (HRP2). Plasma cell-free hemoglobin was associated with disease severity, being higher in severe malaria (median 91.7 ng/mL [IQR 53.7-125]) than in moderately severe malaria (median 44.2 ng/mL [IQR 22.2-76]) or healthy controls (median 22.6 ng/mL [IQR 15.8-40.8]). Plasma hemoglobin was independently associated with endothelial dysfunction (r=0.33; p=0.0001) and increased venous lactate. As well as contributing to anemia in falciparum malaria, hemolysis causes NO quenching and may be a significant contributor to endothelial dysfunction and impaired microvascular perfusion in severe malaria.

1195

PHARMACOKINETIC PROPERTIES OF CHLOROQUINE AND SULFADOXINE-PYRIMETHAMINE IN PREGNANCY

Harin A. Karunajeewa¹, Ivo Mueller², Madhu Page-Sharp¹, Irwin Law¹, Sam Salman¹, Gomorrai Servina², Jovitha Lammey², Stephen Rogerson³, Peter Siba², Kenneth F. Ilett¹, Timothy M. Davis¹

¹University of Western Australia, Perth, Australia, ²Papua New Guinea Institute of Medical Research, Goroka, Papua New Guinea, ³University of Melbourne, Melbourne, Australia

Intermittent preventive treatment in pregnancy (IPTp) may reduce maternal and infant morbidity and mortality. However, few pharmacokinetic (PK) and/or safety data exist for antimalarial drugs in pregnancy. Although chloroquine (CQ) and sulfadoxine-pyrimethamine (SP) are used widely and considered safe, PK data is needed to optimize dosing and maximize effectiveness of IPTp. We have, therefore, performed a PK study of CQ + SP in 30 pregnant women and in a control group of 30 age-matched non-pregnant women in Papua New Guinea. All received one dose of SP (1500/75mg: mean 28/1.4mg/kg) and 3 daily doses of CQ (450mg/day: 8.5mg/kg/day). Women were bled up to 16 times over the ensuing 42 days and plasma assayed for CQ, desethylchloroquine (DECQ), S, N-acetyl-sulfadoxine (NA-S), and P by HPLC. From compartmental modeling of concentration-time data, the volume of distribution (Vd), clearance (Cl) and elimination half-lives (t_{1/2e}) of CQ, S and P were determined. AUC was determined by non-compartmental analysis. Differences in PK parameters between pregnant and non-pregnant groups were assessed by non-parametric statistical methods. A two-compartment model best-described the CQ data and showed that, compared with non-pregnant controls, pregnant subjects had similar Vd (median 180 vs 156l/kg in non-pregnant group: P= 0.5) but significantly more rapid Cl (15 vs 11ml/min/kg: P =0.04), shorter t_{1/2e} (196 vs 236h: P =0.03) and lower AUC for both CQ (34 vs 56µg.h/l: P <0.01) and DECQ (25 vs 47µg.h/l: P <0.01). A one-compartment model best-described the disposition of S showing significantly larger Vd (0.24 vs 0.21l/kg: P <0.01), more rapid Cl (0.022 vs 0.016ml/min/kg: P <0.01), shorter t_{1/2e} (134 vs 161h: P =0.03) and lower AUC (22 vs 34g.h/l: P<0.01) in pregnant subjects. Data for P will also be presented. Because lower plasma concentrations of CQ, DECQ and S could compromise both curative efficacy and post-treatment prophylactic properties in pregnant patients, IPTp regimens should incorporate higher mg/kg doses than recommended for non-pregnant patients.

1196

CD8+ T CELL RESPONSES IN NONLYMPHOID TISSUE AND PARASITE CONTROL DURING *TRYPANOSOMA CRUZI* INFECTION

Matthew H. Collins, Rick L. Tarleton

University of Georgia, Athens, GA, United States

Chagas disease is caused by persistent infection with *Trypanosoma cruzi*. Amastigotes of this protozoan parasite replicate in host cell cytosol, allowing parasite antigens to be presented via class I major

histocompatibility complex. Thus, CD8+ T cells are critical to the immune response to *T. cruzi*. Though the surface phenotype of CD8+ T cells in both spleen and skeletal muscle is consistent with an effector/effector memory phenotype, most CD8+ T cells from skeletal muscle of *T. cruzi*-infected mice are incapable of interferon- γ (IFN γ) production upon *ex vivo* restimulation, suggesting a functional defect that could promote parasite persistence. To determine if this phenomenon was specific for skeletal muscle, we examined adipose tissue, a recently-identified site of parasite persistence in mice. Like CD8+ T cells infiltrating muscle, those in adipose tissue also display an effector/effector memory phenotype and are poor producers of IFN γ after *ex vivo* restimulation. Thus, we conclude that CD8+ T cells isolated from sites of parasite persistence in chronic *T. cruzi* infection have a phenotype and effector potential that is independent of tissue microenvironment. Despite their apparent low effector, we hypothesize that CD8+ T cell activity in sites of parasite persistence is transient but crucial, given that parasite load is very well controlled in these tissues. In support of this hypothesis, we found that a substantial fraction of CD8+ T cells at the sites of infection express the recent activation marker CD69, indicating that this portion of CD8+ T cells is likely responding to parasite antigen. Moreover, trackable CD8+ T cells from spleens of naïve or *T. cruzi*-infected mice transferred into mice with established infection are incorporated into the ongoing response in recipient tissue, developing into effectors and effector memory T cells. We propose a model in which CD8+ T cells contribute to a dynamic peripheral immune response that maintains control of this continuously replicating parasite.

1197

LEISHMANIA BRAZILIENSIS INTERACTION WITH DENDRITIC CELLS: DISTINCT ROLES FOR TLR2 AND TLR3

Diego A. Vargas-Inchaustegui, Lijun Xin, Lynn Soong
University of Texas Medical Branch, Galveston, TX, United States

Leishmania braziliensis (*Lb*) is the causative agent of cutaneous and mucosal leishmaniasis (ML) in South America. In humans, ML is a severe and disfiguring form of the disease and is characterized by excessive B and T cell responses to the parasite. In animal models of *Lb* infection, most inbred strains of mice are genetically resistant to infection, showing only a transient period of active disease. We have recently reported the selective activation of murine DCs and up-regulation of several signals (e.g., STATs and ISG15) that are essential for the activation of innate immunity against *Lb* in mice, as reported previously. However, it remains unclear whether pathogen recognition receptors, such as TLRs, are involved in DC activation, and, if so, how these early events lead to the production of proinflammatory cytokines in *Lb*-infected DCs. To address these issues, we generated bone marrow-DCs from MyD88^{-/-}, TLR2^{-/-} and TLR3^{-/-} mice and examined their responsiveness to *Lb* infection. In contrast to wild-type DCs, which were efficiently activated to produce cytokines and to prime naïve CD4⁺ T cells, the lack of TLR2 expression resulted in a significantly higher expression of MHC class II and co-stimulatory molecules and IL-12p40. As such, *Lb*-infected TLR2^{-/-} DCs were more competent in priming naïve CD4⁺ T cells *in vitro* than were the wide-type controls. This enhanced DC function was unique to TLR2 deficiency, because similarly infected MyD88^{-/-} and TLR3^{-/-} DCs showed a significant reduction in DC activation and T cell priming. Given that TLR2 is known to negatively regulate signals triggered by exogenous stimuli, we propose that TLR2 and TLR3 may play distinct roles in *Lb* infection and are further testing this hypothesis via *in vitro* and *in vivo* approaches. This study will provide new information on the regulation of innate immunity to *Leishmania* parasites.

1198

TLR INVOLVEMENT DURING EXPERIMENTAL MALARIA: IMPLICATIONS FOR BOTH ENDS OF THE CLINICAL SPECTRUM OF HUMAN DISEASE

Constance A. Finney, Ziyue Lu, W. Conrad Liles, Kevin C. Kain
University of Toronto, Toronto, ON, Canada

Plasmodium berghei is a murine model for cerebral malaria whilst *P. chabaudi* is used to study hyperparasitaemia and anemia. The first is characterized by early excess inflammation, leading to host immunopathology and death ('hyperresponsive' model). The second lacks the initial inflammatory response, however, death occurs later through uncontrolled parasitaemia ('hypo-responsive' model). We hypothesized that each model represents a pole of the clinical spectrum observed in human disease, and anticipated that TLRs (and their signaling pathways) would be involved in these divergent clinical outcomes. Despite the important role played by TLR2 in GPI signaling, in both models, no differences were observed between infected TLR2^{-/-} animals compared to wildtype controls (WT). *P. berghei*-infected TLR2^{-/-} mice did not show increased survival compared to susceptible WT mice; parasitaemias, weight, hematocrit, urine hemoglobin and plasma cytokines were similar between the two groups. Furthermore, as with WT mice, TLR2^{-/-} animals infected with *P. chabaudi* proved resistant to infection. No difference was observed in any of the measured parameters between the groups. Contrastingly, in both models, infected IRAK4^{-/-} mice (IRAK4 is a molecule involved in TLR signaling) showed marked differences to WT and TLR2^{-/-} mice during infection. When infected with *P. berghei*, the survival of IRAK4^{-/-} mice (>40% at day 14) was highly improved compared to controls (0% by day 9). Parasitaemias and serum cytokine levels were decreased (TNF, IFN γ , IL-10, p<0.05, Mann-Whitney U), emphasizing the detrimental role of IRAK4 and TLR signaling in early inflammatory responses to malaria. During *P. chabaudi* infection, however, the survival of IRAK4^{-/-} animals was significantly lower than WT animals; the mice also had higher parasitaemias (Kruskal-Wallis, p<0.01), greater weight loss and lower serum cytokine levels than wild-type mice (TNF, two-way ANOVA, p<0.05). This demonstrates the key role played by IRAK4 late in infection, required for parasite clearance. Data from our experiments demonstrate that abrogating inflammation at one end of the clinical spectrum (cerebral malaria) is beneficial to the host, whilst, at the other end of the spectrum (hyper-parasitaemia/anemia), it worsens disease. Our findings emphasize the importance of integrated studies in order to fully understand the impact of treatment/interventions on malaria infection.

1199

MOSQUITO RUNX4 IN THE IMMUNE REGULATION OF PPO GENES AND ITS EFFECT ON AVIAN MALARIA INFECTION

Sang Woon Shin, Zhen Zou, Kanwal Alvarez, Vladimir Kokoza, Alexander Raikhel
University of California Riverside, Riverside, CA, United States

Melanization is a prominent defense mechanism employed by arthropods, including mosquitoes. Conflicting results have been reported when discerning whether phenoloxidase (PO) activation and melanin synthesis can successfully combat the infections of many bacterial and fungal species in flies and the malaria parasites in mosquitoes. The extensive gene expansion of 10 proPO genes, which encode key enzymes to activate melanization, in the mosquito, *Aedes aegypti*, lead us to hypothesize that mosquito melanization reactions have been diversified for distinct purposes. Thus, we showed that the loss of malaria parasites by ookinete melanization in Cactus-depleted mosquitoes is a distinct mechanism from the melanotic tumor formation resulting from Serpin-2 depletion in the mosquito, *Aedes aegypti*. Furthermore, we report that the parasitic loss in the mosquitoes with Cactus depletion is mediated by RUNX4, the orthologue of *Drosophila* Lozenge and a specific transcriptional activator of immune-inducible proPO genes. Specifically, we found that microbial infection induced four mosquito PPO genes, which are proposed to

be independent of Serpin-2 inhibition. This up-regulation is activated indirectly by the Toll immune pathway and directly by RUNX4. Mosquito RUNX4 specifically bound to the RUNT-binding motifs from the mosquito PPO gene promoters and activated *Drosophila* PPO genes in S2 cells. Concurrent silencing of RUNX4 and Cactus dismissed the activation of immune-inducible PPO genes resulting from Cactus depletion and thus compromised the killing of the avian malaria parasite *Plasmodium gallinaceum*. Our findings reveal the presence of a RUNX4-dependent immune activation of PPO genes under the regulation of the Toll immune pathway and its potential immune role to restrict the parasite development. We will further address the role of RUNX4 and immune-inducible PPOs in the immune response against the malaria parasite.

1200

STIMULATION OF TOLL-LIKE RECEPTOR 2 BY *PLASMODIUM FALCIPARUM* GLYCOSYLPHOSPHATIDYLINOSITOLS ENHANCES MACROPHAGE INTERNALIZATION OF PARASITIZED AND UNINFECTED ERYTHROCYTES

Laura Erdman, Kevin C. Kain

University of Toronto, Toronto, ON, Canada

Toll-like receptors (TLRs) are highly conserved innate sensing receptors that activate host defenses upon detection of microbial products. In the context of malaria, *Plasmodium falciparum* glycosylphosphatidylinositols (PfGPI) have been shown to stimulate macrophage cytokine production via TLR2. In addition to their role in inflammation, TLRs have also been characterized as regulators of phagocytosis. *P. falciparum* parasitized erythrocytes (PEs) can be non-opsonically internalized by macrophages in a process predominantly mediated by scavenger receptor CD36. Moreover, uninfected erythrocytes (UEs) are rendered susceptible to macrophage clearance during malaria infection due to surface modifications, and this is believed to contribute to the pathogenesis of severe malarial anemia. We hypothesized that stimulation of macrophage TLR2 by PfGPI would enhance innate clearance of PEs as well as malaria-exposed UEs. We first employed a PE model consisting of anti-CD36 antibodies conjugated to human erythrocytes ("anti-CD36 EBABs"). Pre-stimulation of primary human and murine macrophages with PfGPI or a synthetic TLR2 agonist (FSL-1) significantly increased uptake of anti-CD36 EBABs in a TLR2-dependent manner. Internalization of *P. falciparum* PEs was similarly enhanced. Fc-mediated phagocytosis of IgG-opsonized PEs was modestly increased by TLR2 activation. Notably, stimulation of macrophage TLR2 enhanced phagocytosis of UEs isolated from *P. falciparum* culture. Thus, in this *in vitro* system, TLR2-mediated macrophage activation enhanced clearance of both *P. falciparum* PEs and malaria-exposed UEs. These data underscore the complexity of the role of TLRs in malaria infection: TLR-enhanced phagocytosis may benefit infected individuals by decreasing parasite burden, but in other contexts may predispose to severe malarial anemia by enhancing UE destruction. Therapeutic targeting of TLR pathways in malaria must be carefully considered.

1201

CONGENITAL CHAGAS DISEASE TRANSMISSION IN SANTA CRUZ, BOLIVIA

Caryn Bern¹, Maritza Calderon², Carlos LaFuente³, Gerson Galdos⁴, Maria del Carmen Abastorflor³, Hugo Aparicio⁵, Mark Brady⁵, Lisbeth Ferrufino³, Manuela Verastegui², Robert H. Gilman⁶, Cesar Naquira²

¹Centers for Disease Control and Prevention, Atlanta, GA, United States,

²Universidad Peruana Cayetano Heredia, Lima, Peru, ³Hospital Universitario Japonés, Santa Cruz, Bolivia, ⁴Asociación Benéfica PRISMA, Lima, Philippines, ⁵Asociación Benéfica PRISMA, Lima, Peru, ⁶Johns Hopkins University School of Public Health, Baltimore, MD, United States

Although Santa Cruz city has never had vectorial transmission, Chagas disease prevalence is high due to migration from endemic rural areas. We conducted a study of congenital Chagas disease in a public hospital. From

Nov. 2006 to June 2007, women presenting for delivery were enrolled in serological screening; *Trypanosoma cruzi* infection was confirmed when specimens were positive by 2 or more serological assays (whole epimastigote and recombinant ELISAs, IFA). Maternal blood specimens were also examined by polymerase chain reaction (PCR) using primers targeting kinetoplast minicircle DNA. For infants of seropositive mothers, we collected cord blood and tissue from the umbilical cord segment proximal to the infant, and peripheral blood specimens at 7, 21, 30, 90 and 180 days of life (or until infection was diagnosed). Infant blood specimens were collected in heparinized microhematocrit tubes, centrifuged, and the buffy coat layer examined for the presence of motile trypomastigotes. Cord blood specimens and umbilical tissue were examined by PCR. Of 530 women, 154 (29%) had confirmed positive serology results. Infection prevalence rose by quartile of age: 18.4% (13-18 years), 24.2% (19-23 years), 29.3% (24-29 years) and 46.0% (30-45 years) (Chi square for trend 23.78, $p < 0.0001$). Eight infants were found to have congenital *T. cruzi* infection. Seven were diagnosed by direct examination at 7 (2), 21, 30, 90, 180 and 280 days; no cord blood specimens were positive by direct examination. One infant was diagnosed by serology at 9 months. Seven of 8 infants with confirmed congenital infection had cord blood available for PCR; 5 were positive. Umbilical tissue PCR was positive in 6 of 6 confirmed infected infants. One additional infant whose cord blood specimen was negative by direct examination had positive PCR in cord blood and tissue. Seropositive women with positive PCR were significantly more likely to transmit *T. cruzi* to their infants than those with negative PCR (8/96 PCR-positive vs 0/57 PCR-negative mothers ($p < 0.05$ by 2-tailed Fishers exact test). Infants were treated as soon as infection was confirmed. The rate of congenital transmission has fallen from 10% in the 1980s to 5% of infants of infected women, consistent with findings of other studies. PCR shows promise for early detection of congenital infection, and to predict which women are at highest risk to transmit *T. cruzi* to their infants.

1202

DIAGNOSTIC ACCURACY OF *LEISHMANIA* OLIGOC-TEST FOR THE DIAGNOSIS OF CUTANEOUS LEISHMANIASIS IN PERU

Diego Espinosa¹, Andrea K. Boggild², Stijn Deborggrave³, Thierry Laurent⁴, Cristian Valencia¹, César Miranda-Verástegui¹, Alejandro Llanos-Cuentas¹, Thierry Leclipteux⁴, Jean-Claude Dujardin³, Philippe Büscher³, Jorge Arévalo¹

¹Instituto de Medicina Tropical Tropical "Alexander von Humboldt", Universidad Peruana Cayetano Heredia, Lima, Peru, ²Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, ON, Canada, ³Department of Parasitology, Institute of Tropical Medicine, Antwerp, Belgium, ⁴Coris BioConcept, Gembloux, Belgium

Molecular methods, such as PCR, have become promising tools for the diagnosis of leishmaniasis, both for their high sensitivity and specificity. However, the practical utility of these techniques is limited by their infrastructural requirements and the expertise needed to conduct them. Recently, a simple and rapid dipstick method for the detection of amplified *Leishmania* PCR products was developed (*Leishmania* OligoC-Test). We estimated the diagnostic accuracy of the *Leishmania* OligoC-Test for diagnosis of cutaneous leishmaniasis (CL) on 61 lesions from 45 consecutive patients presenting to the Leishmaniasis Clinic at the Instituto de Medicina Tropical "Alexander von Humboldt", Peru. Lesions were classified as (i) confirmed CL (50 cases), (ii) suspected CL (2 cases) and non CL (9 cases) based on parasitological detection and leishmanin skin test results. The sensitivity of the *Leishmania* OligoC-Test was 72.5% and 92% on lesion aspirates and scrapings, respectively. Furthermore, we compared the assay with a conventional PCR targeting the kinetoplast DNA (kDNA) and a significant higher sensitivity (94%) was observed with the kDNA PCR on the aspirate samples while no significant difference was observed between both methods on the scraping samples (88%). Positive PCR results were observed in the 9 non CL lesions and the role of PCR in CL diagnosis is discussed. Additionally, 4 patients were tested with the OligoC-Test in a low-equipped rural hospital laboratory located in the Peruvian central jungle. The test results were concordant to the outcome

of the conventional diagnostic procedures but obtained only 5 hours after initial sample taking. The evaluated assay showed clear advantages as a simple and rapid molecular tool for diagnosis of CL in reference laboratories and in near-to-field hospital settings.

1203

EQUIVALENCE STUDY USING REDUCED DOSES OF ANTIMONY PLUS RECOMBINANT HUMAN GM-CSF COMPARED WITH ANTIMONY IN STANDARD DOSES FOR CUTANEOUS LEISHMANIASIS: A RANDOMIZED, DOUBLE BLIND STUDY

Roque P. Almeida¹, Maria Elisa A. Rosa², Josiane S. Carvalho², Julia Ampuero³, Luis Henrique Guimaraes², Paulo R. Machado², Edgar M. Carvalho²

¹Federal University of Sergipe, Aracaju-SE, Brazil, ²Federal University of Bahia, Salvador-BA, Brazil, ³Federal University of Brasilia, Brasilia-DF, Brazil

The response to recombinant human granulocyte macrophage colony stimulating factor for the treatment of cutaneous leishmaniasis was evaluated. Forty American cutaneous leishmaniasis (ACL) patients with lesions for ≤ 60 days were enrolled in a double-blind-randomized-placebo controlled trial. The test group included 20 patients treated with GM-CSF intralesionally injected (200 μ) at enrollment, and one week after, associated with parenteral sodium meglumin antimoniate (20mg/Kg/d) for 10 days. The control group included 20 patients treated with standard antimony (20mg/Kg/d) for 20 days plus saline as placebo. EKG and AST, ALT, urea, creatinine, amylase were performed to evaluate antimony toxicity. The results show that GM-CSF applied intraslesionally in conjunction to antimony in reduced time, cures cutaneous leishmaniasis patients in a equivalent time as the full regimen treatment with antimony, 91 +/- 45,69 versus 90,5 +/- 53,2 days, respectively. This study opens the possibility of reducing the treatment of ACL to 10 days which in large population samples might improve adherence to therapy. Moreover, the combined therapy will be important for patients with other conditions that increase the risk of antimony therapy, such as older patients and those with liver, heart and kidney diseases.

1204

A NOVEL AND HIGHLY POTENT CLASS OF COMPOUNDS FOR THE TREATMENT OF TRYPANOSOMIASIS

Richard C. Thompson¹, Tanya Armstrong¹, Wayne M. Best², Susan Charman³, Robert Don⁴, Caroline Laverty³, Giuseppe Luna², Colette Colette²

¹Murdoch University, Murdoch, Australia, ²Epichem Pty Ltd, Murdoch, Australia, ³Centre for Drug Candidate Optimisation, Monash University, Melbourne, Australia, ⁴Drugs for Neglected Diseases Initiative, Geneva, Switzerland

It has been known for some time that trifluralin, an herbicide introduced in the 1960s, exhibits a degree of antiprotozoal activity. This compound is non-toxic and inexpensive to produce, making it a potential lead for an antiparasitic drug discovery program. We initially embarked on a project to make a range of trifluralin analogues, and in particular more water soluble analogues, in an attempt to improve the activity of this class of compound to the point where one may have potential as a commercial drug. Our most recent discovery has been what we refer to as the 3rd Generation Analogues. The compounds described are simple to synthesise and cheap to produce. The best of these compounds exhibited a 4,000-fold increase in activity compared to trifluralin. In particular, they have excellent *in vitro* activity against *Trypanosoma rhodesiense* (40 nM), *T. cruzi* (50 nM), and *Leishmania donovani* (90 nM) and cure *T. rhodesiense* infections in a validated mouse model when given orally. Several representatives of the class are also Ames negative. This work is being undertaken as an antiparasitic drug discovery program funded by the Drugs for Neglected Diseases initiative.

1205

AN2920, A NOVEL OXABORALE, SHOWS *IN VITRO* AND *IN VIVO* ACTIVITY AGAINST *TRYPANOSOMA BRUCEI*

Yvonne R. Freund¹, Jacob Plattner¹, Maha Abdulla², James McKerrow², Tana Bowling³, Luke Mercer³, Bakela Nare³, Steven Wring³, Robert Jacobs³, Nigel Yarlett⁴, Cyrus Bacchi⁴, Louis Maes⁵, Robert Don⁶

¹Anacor Pharmaceuticals, Inc., Palo Alto, CA, United States, ²Sandler Center, University of California San Francisco, San Francisco, CA, United States, ³Scynexis, Inc., Research Triangle Park, NC, United States, ⁴Haskins Laboratory, Pace University, New York, NY, United States, ⁵University of Antwerp, Antwerp, Belgium, ⁶Drugs for Neglected Diseases initiative, Geneva, Switzerland

Trypanosoma brucei is the causative agent of Human African Trypanosomiasis (HAT) a protozoan disease of sub-Saharan Africa. The WHO estimates that approximately 500,000 people suffer from HAT and existing therapies are either ineffective or toxic. Anacor Pharmaceuticals, Inc has been developing small molecule, boron-containing compounds with anti-microbial activities. A novel compound, AN2920, is part of a series of boron-containing molecules with activity against *T. brucei*. AN2920 demonstrates *in vitro* efficacy against *T. brucei brucei* (IC₅₀ = 0.41 μ M) and *T. b. rhodesiense* (IC₅₀ = 0.53 μ M). No cytotoxicity was observed at 24 hr when assayed using murine L929 fibroblasts. In a 72-hr L929 cytotoxicity assay the IC₅₀ = 30.3 μ M. No significant metabolism was observed by mouse liver microsomes and the half life of the compound, tested for 30 min at 1 μ M in the presence of microsomes, was >350 min. To test *in vivo* efficacy of AN2920 in a mouse model, animals were infected with the laboratory strain of *T. b. brucei* and treated intraperitoneally (IP) for 5 days with 100 mg/kg of AN2920 twice per day (BID). After 4 weeks, 100% survival without parasitemia was observed. Efficacy was also observed against *T. b. gambiense* using this dosing regimen. AN2920 was retested against *T. b. brucei* at 20 mg/kg BID, dosing orally and IP. After 30 days, 33% survival was observed for both dosing routes. AN2920 extended the lives of uncured animals by 2-3 fold beyond untreated controls. Taken together, these results suggest that boron-containing small molecules may be novel chemical entities for treatment of HAT.

1206

SCREENING FDA APPROVED DRUGS FOR ACTIVITY AGAINST *TRYPANOSOMA CRUZI*: LOOKING FOR COMBINATION CHEMOTHERAPY FOR CHAGAS DISEASE

Frederick S. Buckner, Joseph D. Planer
University of Washington, Seattle, WA, United States

Trypanosoma cruzi infection remains an important public health problem in Latin America with more than 12 million individuals chronically infected. Current therapy for Chagas disease consists of nifurtimox or benznidazole; both drugs are poorly tolerated and are not fully effective in the chronic stage of the infection. The cost of new drug development is a major impediment to bringing new chemical entities through preclinical and clinical testing for use against neglected diseases. Thus, we are testing FDA approved drugs for anti-*T. cruzi* activity, alone and in combinations. A semi-high throughput screening method was employed using mammalian stage *T. cruzi* grown in murine fibroblast cells with parasite growth quantified by β -galactosidase reporter activity, as reported previously. The Microsource Spectrum collection of 2000 compounds (including >500 FDA approved drugs) was screened in duplicate at a single concentration of 10 μ M. First pass hits included 356 compounds (17.8%) that inhibited growth by >75%. After excluding compounds that were not drug candidates (alkylating agents, topical drugs, etc.) and were non-toxic to mammalian cells at 10 μ M, we had a list of 148 compounds (7.4%). Additional testing showed most of these compounds with IC₅₀ activity in the range of 1-10 μ M and five compounds with submicromolar activity. The active compounds (IC₅₀ <10 μ M) fell into a variety of classes including:

antihistamines, selective serotonin reuptake inhibitors, benzodiazepines, tricyclics, and antibiotics. The lab is currently testing combinations of these compounds (with each other and with established anti-*T. cruzi* inhibitors) to search for synergistic combinations. Active combinations will be studied in the murine Chagas disease model to validate the approach of using off-the-shelf compounds for combating a neglected parasitic disease.

1207

ANTILEISHMANIAL ACTIVITY OF SELECTED FDA-APPROVED DRUGS IN A MURINE CUTANEOUS LEISHMANIASIS MODEL

David Saunders, Qiqui Li, Carlson Misty, Lisa Xie, Qiang Zheng, Jing Zhang, Juan Mendez, John Tally, Alan Magill, Grogl Max, Suping Jiang, Peter Weina

Walter Reed Army Institute of Research, Silver Spring, MD, United States

Current therapeutic options licensed in the U.S. for cutaneous leishmaniasis (CL) are extremely limited. Current intravenous therapies, such as sodium stibogluconate have considerable associated toxicities, and are suboptimal means of treating a self-limited skin disease, albeit a potentially debilitating one. Oral azoles have shown modest efficacy in limited settings. The limited local therapies available are generally suitable only for uncomplicated lesions. There is a need for a safe oral drug for CL. We recently presented a large scale effort to screen already FDA-approved drugs for *in vitro* activity against *Leishmania major*, using infected macrophages. To date 1100 drugs have been screened *in vitro*. We established an *L. major*-infected BALB/c screening model to test drugs with potent *in vivo* activity (IC₅₀ less than 10 mcg/mL). Candidate drugs were first subjected to a rigorous decision matrix to determine suitability for 2-4 weeks of continuous oral therapy, favorable pharmacokinetics, and prior testing *in vivo* or in humans. Drug screening is currently ongoing. We will report on the results of the top 5-10 candidate drugs in the *in vivo* mouse model. Most of the active substances belong to categories of fungicides, antibiotics, anti-asthmatics, antiprotozoals and antidepressants. The intent of our strategy is to accelerate the process of antileishmanial drug development with reduced cost and shortened timelines.

1208

ROLE OF RED CELL COMPLEMENT REGULATORY PROTEINS IN ERYTHROPHAGOCYTOSIS DURING *PLASMODIUM CHABAUDI* INFECTION

Juliana V. Harris¹, Catherine N. Stracener¹, Xiaobo Wu², Dirk Spitzer², John P. Atkinson², José A. Stoute¹

¹Uniformed Services University, Bethesda, MD, United States, ²Washington University, St. Louis, MO, United States

Plasmodium falciparum malaria accounts for 1-2 million deaths per year, with the majority due to complications such as severe anemia. The pathogenesis of this anemia is not completely understood and cannot be explained solely by the direct destruction of red cells by the parasite. Red cells of children with severe anemia and malaria are deficient in the complement regulatory proteins (CRPs) decay accelerating factor (DAF/CD55) and complement receptor 1 (CR1/CD35). In order to understand the significance of these deficiencies we studied the role of the mouse complement receptor 1 related protein Y (Crry) in red cell protection during infection with *P. chabaudi*. We hypothesized that Crry heterozygous knockout mice (Crry^{+/−}) infected with *P. chabaudi* would have more severe anemia than wild-type mice. There were no differences in anemia between knockout and wild-type animals due to compensatory extramedullary hematopoiesis. However, *P. chabaudi*-infected Crry^{+/−} mice showed increased erythrophagocytosis compared to wild-type animals, suggesting that complement activation is an important mechanism in this phenomenon. Erythrophagocytosis of uninfected red cells may be important in the development of anemia, as it is a common finding in tissues of malaria-infected patients and animals. Therefore, we are investigating the role of complement in erythrophagocytosis by quantitating C3 deposition on red cells using immunohistochemistry and

by use of complement inhibitors to reverse erythrophagocytosis. Results of these studies will reveal potential therapeutic strategies to diminish uninfected red cell destruction during malaria infection in humans.

1209

ATP DEPLETION OF RED BLOOD CELLS RECAPITULATES THE PHENOTYPE ASSOCIATED WITH PYRUVATE KINASE DEFICIENCY AND PROTECTS AGAINST *PLASMODIUM FALCIPARUM* MALARIA

Kodjo Ayi¹, Conrad W. Conrad², Kevin C. Kain³

¹Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health, University of Toronto, Toronto, ON, Canada, ²Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health and Molecular Medicine; Institute of Medical Sciences, Toronto, ON, Canada, ³Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health and Molecular Medicine; Institute of Medical Sciences, University of Toronto, Toronto, ON, Canada

The protective effect of pyruvate kinase deficient (PKD) erythrocytes in *Plasmodium falciparum* infection has been demonstrated. There is inhibition of merozoite invasion into PKD erythrocytes, as well as increased phagocytosis of PKD erythrocytes infected with early stages of *P. falciparum* infection. PK deficiency arises from a number of different mutations in the *PKLR* gene leading to impaired enzyme activity. In agreement with previous reports, we found reduced levels of ATP in PKD homozygous erythrocytes compared to normal erythrocytes (31±14%), as well as in PKD heterozygous erythrocytes (64±7%). The inhibition of glycolysis at the level of enolase by fluoride has been used as a model system for inherited erythrocyte pyruvate kinase deficiency. Using normal erythrocytes treated with sodium fluoride at different concentrations, we show that there is a correlation between ATP levels and inhibition of parasite invasion and enhanced phagocytosis of ring-forms. We further observed increased levels of ATP in parasitized PKD erythrocytes and fluoride treated erythrocytes compared to the parasitized normal, G6PD deficient and β-thalassemia erythrocytes. These data suggest that the chemical conversion of normal erythrocytes to reduced-level-ATP erythrocytes will facilitate the investigation of the mechanism of protection of PKD erythrocytes against *P. falciparum*.

1210

AFM STUDY OF THE EXTRACELLULAR AND THE CYTOPLASMIC SURFACES OF *PLASMODIUM FALCIPARUM* INFECTED ERYTHROCYTE MEMBRANES

Hui Shi, Ang Li, Jing Yin, Kavin Tan, Chwee Teck Lim

National University of Singapore, Singapore, Singapore

Infection of human erythrocytes by the protozoan *Plasmodium falciparum* results in dramatic morphological and functional changes of host cells. During the process of maturation, parasites export parasite-expressed proteins, such as PfEMP1 and KHARP, to the host cell membrane thus forming knobs on the host cell surface and thereby stiffening the membrane and causing cytoadherence (cell stickiness) to occur. To investigate the formation of knobs as well as the relationship between knobs and the host cell cytoskeleton, atomic force microscopy (AFM) was used to study both the extracellular and the cytoplasmic surfaces of infected erythrocyte membranes. Although the cytoskeletal structure can be observed from both the extracellular surface and cytoplasmic surface, the AFM images of cytoplasmic surface uncovered more details of the spectrin network. Knobs and their connections or linkages to the spectrin network were clearly observed from the cytoplasmic surface of infected erythrocytes. The size and distribution of knobs viewed from the cytoplasmic surface were similar to those observed from the extracellular surface. While the spectrin network seems quite intact during the trophozoite stage, some breakages of the cytoskeleton are detected at the schizont stage. Furthermore, some internal structures such as transport vesicles, parasite-generated membrane system as well as parasites at the trophozoite stage were also imaged using AFM. Finally, numerous

super-sticky submicrometer crystals were also observed to adhere to the inner surface of the membrane at the schizont stage. This study may help to further understand the internal changes undergone by the host erythrocytes during parasite maturation.

1211

IDENTIFICATION OF A NOVEL FAMILY OF VARIANT SURFACE ANTIGENS IN *PLASMODIUM FALCIPARUM*

Amanda K. Lukens¹, Daniel E. Neafsey², Stephen F. Schaffner², Daniel J. Park², Philip Montgomery², Sarah K. Volkman¹, Pardis C. Sabeti², Danny A. Milner, Jr.¹, Johanna P. Daily¹, Ousmane Sarr³, Daouda Ndiaye³, Omar Ndir³, Souleymane Mboup³, Nicole Stange-Thomann², Roger C. Wiegand², Bruce W. Birren², Daniel L. Hartl⁴, James E. Galagan², Eric S. Lander², Dyann F. Wirth¹

¹Harvard School of Public Health, Boston, MA, United States, ²The Broad Institute of MIT and Harvard, Cambridge, MA, United States, ³Cheikh Anta Diop University, Dakar, Senegal, ⁴Harvard University, Cambridge, MA, United States

Plasmodium falciparum variantly expressed surface antigens (VSA) have been proposed as an escape mechanism from the host immune response giving rise to persistent infections in humans. With a portion of the genome still uncharacterized, we sought a means to identify novel VSA that might play a role in pathogenesis. We hypothesized that nucleotide diversity, variant expression, and presence of the Pexel motif could be used to filter the genome into a testable set of candidate VSA. We identified over 93,000 high confidence SNPs across the genome. Most genes demonstrate low pairwise nucleotide diversity (π), with 85% of the genome having a π value less than 2.0×10^{-3} . To identify novel antigens, we focused on the top 5% of highly diverse genes and further evaluated the 3D7 transcriptome and a set of five patient transcriptomes to identify variantly expressed genes. To discriminate genes that are exported to the surface of the infected red blood cell, we also factored the presence of the Pexel motif into our analysis. Candidates that fulfilled our filter criteria could be divided into two groups: a large number of known antigens, and a handful of uncharacterized genes. One small paralogous gene family demonstrated significantly higher nucleotide diversity than other Pexel containing genes, which is consistent with the prediction that they represent a novel family of VSAs. Steady-state transcriptome analysis indicates that these genes are expressed across different parasite lines and are generally up-regulated *in vivo*. To test their antigenicity, we have expressed recombinant protein from these genes and tested their reactivity with antibodies in patient plasma samples from immune patient volunteers from Senegal. Preliminary analysis shows that these proteins are variantly recognized in different immune patient samples, supporting our hypothesis that they are variant antigens. We are also determining the cellular localization of these gene products. Nucleotide diversity, along with other bioinformatic parameters, represent a powerful tool for identifying novel genes involved in pathogenesis and predict new targets for vaccine development in various infectious diseases.

1212

CHARACTERIZATION OF NATURALLY ACQUIRED ANTIBODIES TO PFRH DOMAINS AND DETERMINATION OF THEIR FUNCTIONAL INHIBITORY ACTIVITY

Ambroise D. Ahouidi¹, Amy K. Bei², Ousmane Sarr¹, Daouda Ndiaye¹, Omar Ndir¹, Dyann Wirth², Souleymane Mboup¹, Manoj T. Duraisingh²

¹Le Dantec Hospital and Cheikh Anta Diop, Dakar, Senegal, ²Harvard School of Public Health, Boston, MA, United States

Field studies conducted in malaria-endemic areas contribute to our understanding of naturally acquired immunity to malaria and also aid in identifying potential candidate molecules to select for a vaccine. The invasion of erythrocytes by *Plasmodium falciparum* occurs through multiple receptor-ligand interactions. Members of the Pfrh protein

family play a critical role in directing *P. falciparum* parasites to alternative receptors for invasion. These proteins localize to the merozoite surface and are exposed to the blood stream during the process of invasion; however, they remain unstudied for their contribution to the humoral immune response against *Plasmodium*. This study investigates whether plasma from malaria infected individuals in Senegal contains antibodies against domains within the Pfrh proteins but also assesses the inhibitory activity of these antibodies with respect to invasion. Sera were collected from malaria infected patients from different areas in Senegal with different endemicities over a period of 4 years (n= 539). Total IgG to recombinant antigens representing the unique domains of the Pfrh paralogs, Pfrh1, Pfrh2a, Pfrh2b and Pfrh4, were determined by ELISA. Immune reactivity in this population to Pfrh2a and Pfrh2b was significantly greater (40.8% and 16.1% respectively) compared to Pfrh4 and Pfrh1 (5.1% and 3.4% respectively). Of positive IgG responses, we have determined IgG subclass and find that IgG1 and IgG3 are predominant. We are determining associations between IgG subclass and age, parasite density, seasonally and sequence polymorphisms. We have also determined immune responses to specific C-terminal regions that distinguish Pfrh2a and Pfrh2b. In addition to IgG titer we also address the potential inhibitory activity of these antibodies using *P. falciparum* knockout strains lacking Pfrh ligands. We are currently performing invasion assays using these parasite lines in the presence of purified IgG in which non-specific inhibitory factors had been removed. The presence of a humoral response to the Pfrh proteins together with invasion inhibitory potential will validate these proteins as potential vaccine candidate antigens.

1213

GENOTYPIC DIFFERENCES IN *PLASMODIUM FALCIPARUM* FROM DIFFERENT MALARIAL DISEASE STATES IN CHILDREN FROM UGANDA

David M. Menge¹, Robert O. Opoka², Chandy C. John³

¹Center for Infectious Diseases and Microbiology Translational Research, University of Minnesota, Minneapolis, MN, United States, ²Department of Paediatrics and Child Health, Makerere University Medical School and Mulago Hospital, Kampala, Uganda, ³Global Pediatrics Program, University of Minnesota, Minneapolis, MN, United States

Plasmodium falciparum infection leads to widely different clinical conditions in children ranging from cerebral malaria (CM), severe malarial anemia (SMA), uncomplicated malaria (UM) and asymptomatic parasitemia (AP). Studies on parasite and human genetics may help in determining the molecular basis of the diversity of clinical outcomes. We used polymorphic merozoite surface protein 1 and 2 (MSP-1 and 2) and glutamate rich protein (GLURP) DNA markers to genotype *P. falciparum* parasites collected from children with CM, UM and AP from Uganda. In total 94, 88 and 65 samples from children with CM, UM and AP respectively were assayed. Differences in the frequencies of parasite genotypes of *P. falciparum* parasites between CM, UM and AP were determined by χ^2 tests. Frequencies of one or more alleles from the MSP-1 RO33 and MAD20, MSP-2 FC27 or GLURP allelic families did not differ between children with CM, UM or AP. Children with CM or UM were more likely to have one or more MSP-1 K1 alleles than children with AP (97.8 % vs 83.1%, $P = 0.002$, and 98.9% vs 83.1%, $P = 0.005$, respectively), but children with CM and UM did not differ in MSP-1 K1 allele frequency. Children with CM were also more likely to have one or more MSP2-3D7 alleles than children with AP (92.2% vs 75.4%, $P = 0.03$), but in addition, children with CM were more likely to have one or more MSP-2 3D7 alleles than children with UM (92.6% vs 80.7%, $P = 0.02$). These study results suggest that MSP2-3D7 genotypes may be overrepresented in children with CM as compared to uncomplicated malaria or asymptomatic parasitemia. This may relate to functional differences conferred by this genotype or to the association of this genotype with an unrelated genetic factors. Analysis with microsatellite markers may allow further characterization of strains associated with increased disease severity. Insight into the structural and functional diversity of genes associated with virulence could reveal new strategies for intervention of malarial disease.

1214

ABO POLYMORPHISM AND *PLASMODIUM FALCIPARUM* MALARIA

Kayla T. Wolofsky¹, Kodjo Ayi², Conrad W. Liles³, Christine M. Cserti-Gazdewich⁴, Kevin C. Kain⁵

¹McLaughlin-Rotman Centre for Global Health; Institute of Medical Sciences, University of Toronto, Toronto, ON, Canada, ²Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health, University of Toronto, Toronto, ON, Canada, ³Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health and Molecular Medicine; Institute of Medical Sciences, University of Toronto, Toronto, ON, Canada, ⁴Blood Transfusion Laboratory, Toronto General Hospital; Department of Laboratory Hematology, University of Toronto, Toronto, ON, Canada, ⁵Tropical Disease Unit, McLaughlin-Rotman Centre for Global Health and Molecular Medicine; Institute of Medical Science, University of Toronto, Toronto, ON, Canada

Malaria has been a major selective force on red blood cell (RBC) polymorphisms that confer protection to severe disease. Several lines of evidence suggest that the outcome of *Plasmodium falciparum* infection may also be influenced by ABO blood group antigens. Blood type O predominates in malaria endemic regions and has been associated with protection from developing severe and complicated malaria. Although the molecular details of protection has not been fully elucidated, previous studies have demonstrated reduced rosetting in type O RBCs. Based on observations showing enhanced phagocytosis of infected RBCs occurs with other RBC polymorphisms associated with protection, we hypothesized that infected type O RBCs may be more efficiently cleared by the innate immune clearance than type A RBCs. Here we show that primary human macrophages phagocytosed *P. falciparum*-infected type O RBCs more avidly than infected type A RBCs ($p < 0.001$). Furthermore, that hemichrome deposition in infected type O RBCs is significantly greater than in infected type A RBCs ($p < 0.05$), which may account for enhanced recognition and phagocytosis of type O infected RBCs. Collectively our data suggest that type O individuals may have more proficient clearance of infected RBCs contributing to an overall decrease in parasite burden and a reduction of the number of infected erythrocytes available to bind within the microvascular beds of vital organs. This represents an additional putative mechanism by which blood type O may contribute to protection against severe malaria.

1215

MOLECULAR CHARACTERISATION OF PYRETHROID RESISTANCE IN *ANOPHELES FUNESTUS*, MALARIA VECTOR IN AFRICA

Charles Wondji¹, John Morgan¹, Helen Irving¹, Maureen Coetzee², Hilary Ranson¹, Janet Hemingway¹

¹Liverpool School of Tropical Medicine, Liverpool, United Kingdom, ²Vector Control Reference Unit, National Institute for Communicable Diseases, NHLS, Johannesburg, South Africa

A major QTL *rp1* conferring pyrethroid resistance to the malaria vector *Anopheles funestus*, was previously identified. Here we present a fine-scale mapping of *rp1*, the identification and characterisation of the genes conferring this resistance. 650 F6 and F8 individuals from reciprocal crosses between susceptible and resistant strains were genotyped with SNPs and microsatellite markers for QTL mapping. A BAC clone containing *rp1* was sequenced and annotated. Quantitative PCR were carried out to study the expression pattern of the P450s genes and the *in vitro* interaction of the genes differentially expressed with pyrethroids was assessed. *rp1* was the major QTL explaining 85% of the genetic variance to pyrethroid resistance. Two other QTLs of minor effect *rp2* and *rp3* were detected. Fifteen genes were identified in the 120kb BAC clone containing the *rp1* QTL with a cluster of 10 P450 genes among which CYP6P9 and CYP6P4 were duplicated. These two genes were significantly differentially expressed between susceptible and resistant strains. Enzymes from these genes metabolise pyrethroid *in vitro*. Specific mutations associated with

resistance were identified in CYP6P9 and CYP6P4. For each gene, two A/G SNPs were identified and genotyped for over 650 specimens. The G/G genotypes confer resistance at 100% and these could be used to design of a diagnostic assay to detect this metabolic resistance. In conclusion, CYP6P9 and CYP6P4 are the main genes conferring pyrethroid resistance in the laboratory strain FUM0Z-R. Further studies will be carried out to estimate their contribution in the pyrethroid resistance in field populations.

1216

TOXICITY OF HIGHLY SELECTIVE CARBAMATES TOWARDS THE MALARIA MOSQUITO, *ANOPHELES GAMBIAE*

James M. Mutunga, Troy D. Anderson, Bryan T. Jackson, Joshua A. Hartsel, Sally L. Paulson, Paul R. Carlier, Jeffrey R. Bloomquist Virginia Tech, Blacksburg, VA, United States

Insecticide-treated bednets (ITNs) are an important tool for the management of *Anopheles gambiae*, the major vector of malaria in Africa. Pyrethroids are the only insecticides approved for bednet treatments; however, widespread resistance and lack of alternative chemicals undermine the use of ITNs for mosquito control. Our research focus is to develop highly selective insecticides with high mosquito toxicity and low mammalian toxicity that might be used in parallel with current-use pyrethroids. We report the re-engineering of carbamate insecticides to increase selectivity and mitigate resistance development in *An. gambiae*. Based on mosquito acetylcholinesterase (AChE) protein homology modeling, we have synthesized new carbamates that are highly selective to *An. gambiae* AChE. Anticholinesterase activities of each carbamate were evaluated for both human and mosquito AChEs and compared to those of propoxur (WHO standard for mosquito control), and other conventional carbamate insecticides. We demonstrate novel carbamates of greater selectivity (ca. > 8000-fold) towards *An. gambiae* AChE, compared to 3-fold selectivity with propoxur. The new carbamates have increased potency towards mosquitoes (ca. 60-fold) than that of propoxur. We confirm both intrinsic and contact mosquito toxicity of these carbamates and demonstrate comparable toxicities to that of propoxur, and other conventional carbamates. With such high levels of selectivity, potency and toxicity, these novel carbamates provide valuable leads to developing of alternative mosquitocides for use in insecticide treated bednets and indoor residual sprays. Our findings are important in the search for new mosquito selective-insecticides and the possible use of these carbamates in malaria control programs will be discussed.

1217

COMBINING ORGANOPHOSPHATES AND REPELLENTS ON FABRICS: A PROMISING STRATEGY TO BETTER CONTROL PYRETHROID RESISTANT MOSQUITOES

Cédric Pennetier¹, Costantini Carlo², Chabi Joseph³, Dabiré Rock⁴, Corbel Vincent¹, Lapied Bruno⁵, Pagès Frédéric⁶, Hougaard Jean-Marc³

¹Institut de Recherche pour le Développement, Montpellier, France, ²Institut de Recherche pour le Développement, Bobo-Dioulasso, Burkina Faso, ³Institut de Recherche pour le Développement, Cotonou, Benin, ⁴Institut de Recherche en Sciences de la Santé (IRSS), Bobo-Dioulasso, Burkina Faso, ⁵Université d'Angers, Angers, France, ⁶Institut de Médecine Tropicale du service de Santé des Armées, Marseille, France

With the spread of pyrethroid resistance in most mosquito vector species and the lack of alternative compounds for public health, the search for new strategies that provide better control of resistant populations has become a priority. A new concept was developed in the laboratory by mixing repellents and non pyrethroid insecticides. Here, this concept was studied for personal and community protection under field conditions in Benin and Burkina Faso, West Africa. Indeed we studied the efficacy of battle-dress and bed nets impregnated with organophosphate(PM)/repellent(DEET or KBR) mixtures, respectively against *Aedes aegypti*, the main dengue and yellow fever vector and *Anopheles gambiae*, the main

malaria vector, First, KBR and PM+KBR impregnated battle-dress allowed better protection against *Ae. aegypti* bites than permethrin impregnated battle-dress. Secondly, results showed evidence of synergism between repellents (DEET or KBR) and pyrimiphos-methyl (PM) on nets in field conditions. PM+DEET and PM+KBR treated nets were as effective as a standard pyrethroid (deltamethrin 25mg/m²) against susceptible *An. gambiae* populations and more effective against resistant *An. gambiae* populations. Results also demonstrated that mixtures did select neither *Kdr* allele nor *ACE1^R* allele. In conclusion, these field trials showed that mixing repellents and organophosphates has the potential to be a good alternative strategy to manage the spread of resistance. However, significant improvements remain to be done to improve residual effect of Insecticide-Repellent Treated fabrics.

1218

DEVELOPMENT OF A NOVEL FORMULATION FOR USE IN INDOOR RESIDUAL SPRAY PROGRAMS

John R. Lucas¹, Takaaki Itoh², Yoshinori Shono², Luc Djogbénou³, Jean-Marc Hougard³

¹Sumitomo Chemical Co. (UK) Plc, London, United Kingdom, ²Sumitomo Chemical Co., Ltd., Environmental Health Division, Tokyo, Japan, ³Centre de Recherches Entomologiques de Cotonou (CREC), Cotonou, Benin

Fenitrothion wettable powder (WP) is recommended by the World Health Organization (WHO) for Indoor Residual Spraying (IRS) against malaria vectors. However, with the increase in the use of Long Lasting Insecticidal Nets (LLINs) as a low cost and highly effective intervention, IRS has more recently been used in many parts of Africa as a secondary treatment option, or for use in epidemic zones. In some instances, particularly in highly malarious areas, the use of LLINs and IRS together can give very dramatic reductions in incidence. With the focus now turning towards the elimination or eradication rather than control of malaria, the combination of several vector control interventions combined with the administration of effective anti-malarial drugs will become the norm as countries step up their efforts to eliminate this parasite. There is an increasing concern over the development of resistance to pyrethroids, possibly affecting LLIN performance, which are currently all dependent on this insecticide class. To minimize selection pressure the use of pyrethroid-based IRS products is not recommended with LLIN applications. Alternatives to the widespread use of pyrethroid and DDT-based IRS products are clearly needed (*kdr* resistant insects share a common resistance mechanism to DDT and pyrethroids). To meet this need, a novel Sumithion® IRS formulation is being developed. Laboratory trials to evaluate residual efficacy on a range of representative substrate types against *Anopheles* mosquitoes have been conducted. This data, along with interim results of Phase II hut studies being conducted in Benin are presented.

1219

HUMAN ANTIBODY RESPONSE TO ANOPHELES GAMBIAE SALIVA: A NEW IMMUNO-EPIDEMIOLOGICAL MARKER TO EVALUATE THE EFFECTIVENESS OF INSECTICIDES TREATED NETS (ITNS)?

Papa Makhtar Drame¹, Anne Poinsignon², Patrick Besnard³, Sylvie Cornélie², Vincent Foumane⁴, Cheikh Saya Sow¹, Jacques Le Mire⁵, Filomena Fortes⁶, Denis Boulanger², Pierre Carnevale², Francois Simondon², Franck Remoue¹

¹Institut de Recherche pour le Développement, Dakar, Senegal, ²Institut de Recherche pour le Développement, Montpellier, France, ³Service Médical Sonamet, Lobito, Angola, ⁴Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale (OCEAC), Yaoundé, Cameroon, ⁵Service Médical Clinique Sonamet, Lobito, Angola, ⁶Malaria Control Program, Luanda, Angola

In a way to improve malaria control, many efforts are conducted under WHO recommendations to develop new tool/indicator for malaria control, such as for evaluating the anti-vector strategies. Previous studies

have shown that the evaluation of human antibody (Ab) response to arthropod salivary proteins represent an epidemiological indicator of exposure to vector bites, and especially our team demonstrated that IgG response to whole saliva of *Anopheles gambiae* in exposed individuals represent a marker of the intensity of *Anopheles* exposure. The objective of the present study was to validate whether this immunological marker based on human anti-saliva IgG Ab levels could be one new indicator to evaluate the effectiveness of ITNs use in malaria control programs. One longitudinal study, concerning individuals (n=108, children and adults) living in malaria endemic area in Angola, was performed from March 2005 to October 2006. The studied cohort was followed for parasitological, clinical, entomological and immunological data, each 6 weeks before and after the well-controlled use of Permane® mosquito nets (Long Lasting Insecticide Net; installation in Feb. 2006). Seasonal variations of anti-saliva IgG Ab levels to *An. gambiae* saliva were observed before and after the installation of ITNs which appeared to be associated with the exposure to *An. gambiae* (evaluated by the classical entomological methods) and the prevalence/intensity of malaria infection. Moreover, a significant decrease of the anti-saliva IgG response was observed after the ITNs use which was correlated with the decrease of malaria parasitemia, the current and referent criteria showing the effectiveness of these ITNs. In a way to identify new tools for malaria control, we have shown that anti-saliva IgG response in exposed individuals could be not only an immunological marker of exposure to *An. gambiae* bites, but also a potential indicator for evaluating the ITNs effectiveness. Several future studies are needed to confirm this hypothesis in other transmission areas and to identify some immunogenic salivary proteins as higher specific markers. Nevertheless, this study represents a first approach to elaborate such new indicators for evaluating the effectiveness of anti-vector strategies, bases on the evaluation of human Ab response to salivary proteins of arthropod vectors.

1220

EFFICACY OF INSECTICIDE TREATED MATERIALS (ITMS) FOR DENGUE CONTROL IN LATIN AMERICA AND ASIA: CLUSTER RANDOMIZED CONTROLLED TRIALS IN VENEZUELA AND THAILAND

Audrey Lenhart¹, Elci Villegas², Carmen Elena Castillo², Yuwadee Trongtokit³, Chamnarn Apiwathnasorn³, Neal Alexander⁴, Philip J. McCall¹

¹Liverpool School of Tropical Medicine, Liverpool, United Kingdom, ²Universidad de los Andes, Trujillo, Venezuela, ³Mahidol University, Bangkok, Thailand, ⁴London School of Hygiene and Tropical Medicine, London, United Kingdom

Dengue fever is the fastest spreading arboviral disease worldwide. In the absence of a vaccine, *Aedes aegypti* vector control remains the most effective strategy to prevent dengue transmission. Our initial studies in Latin America indicated that insecticide treated materials (ITMs) can impact on dengue vector populations and potentially on dengue virus transmission. Cluster randomized trials are underway in Venezuela (6000 households in 75 clusters) and Thailand (2000 households in 26 clusters) to further clarify the efficacy of ITMs in suppressing dengue vector populations. These trials incorporate several advances on the earlier studies: first, different types of ITMs are being tested alone and in combination and householders may choose the manner of deployment; secondly, spill-over effects of the interventions into neighboring control areas are monitored by including external control sites; thirdly, efficacy of ITMs for dengue vector control is measured on a large scale for the first time in SE Asia. Both study sites had high entomological indices at baseline (Venezuela average pupae per person index = 0.52, average Breteau index = 15.3; Thailand average pupae per person index = 0.22, average Breteau index = 22.4), and the ITM interventions were adopted and maintained by the population in both sites to a similar extent, although their manner of deployment varied (Venezuela: window curtains and jar covers; Thailand: indoor and window curtains). Although the trials are set to complete in early 2009, preliminary data and analyses will be presented and important

differences affecting the potential applicability of ITM use in Venezuela and Thailand will be discussed.

1221

REDUCED EFFICACY OF PYRETHROID SPACE SPRAYS FOR DENGUE CONTROL IN PYRETHROID RESISTANCE AREA (MARTINIQUE)

Sebastien Marcombe¹, Alexandre Carron², Frédéric Darriet¹, Manuel Etienne Etienne³, Michel Tolosa Tolosa², Marie-Michèle Yp-Tcha³, Christophe Lagneau², André Yébakima¹, Vincent Corbel¹

¹Institut de Recherche pour le Développement, Montpellier, France, ²Entente Interdépartementale pour la Démoustication du littoral méditerranéen (EID Méditerranée), Montpellier, France, ³Centre de Démoustication, Fort de France, Martinique

The last 30 years saw a dramatic resurgence of several infectious diseases like Dengue fever and Chikungunya causing major public health problems. Unfortunately, vector control remains extremely difficult to implement because it requires a large budget, skilled staff, commitment, and active community participation. To reduce the infection rate during epidemics, space spraying is the only solution for adult mosquito control. In the Caribbean, insecticide resistance is widely developed in *Aedes aegypti* and may represent a serious obstacle for dengue vector control. In this context, the efficacy of pyrethroid and organophosphate ULV-space sprays was investigated in Martinique (French West Indies) where *Ae. aegypti* previously shown to be resistant to conventional insecticides. WHO cylinder tests showed high level of resistance of a wild-field caught population of *Ae. Aegypti* to deltamethrin (RR₉₅ = 68) and, in a lesser extend, to pyrethrum (RR₉₅ = 14) and naled (RR₉₅ = 12) compared to the susceptible reference strain. A simulated field trial implemented in this locality showed that this resistance can strongly reduce the knock-down effect and mortality of deltamethrin (1 g/ha) and synergized pyrethrins (10 g/ha) applied by thermal fogging. The mortality rates of all pyrethroids were below 60% at 20 m and then dropped below 30% at 30 m. Conversely, the efficacy of naled (114 g/ha) was high against both susceptible and resistant mosquitoes, i.e. mortality and KD effect were above 75% until 50 m. This finding has important implications for dengue vector control and emphasizes the need to develop innovative tools and strategies to maintain effective control of multi resistant *Ae. aegypti* populations.

1222

FATAL OUTBREAK FROM CONSUMING XANTHIUM STRUMARIUM SEEDLINGS DURING TIME OF FOOD SCARCITY IN NORTHEASTERN BANGLADESH

Emily S. Gurley¹, Mahmudur Rahman², M. Jahangir Hossain¹, Nazmun Nahar¹, Be-Nazir Ahmed², Rebeca Sultana¹, Selina Khatun², M. Sabbir Haider², M. Saiful Islam¹, Utpal K. Mondal¹, Stephen P. Luby¹

¹International Center for Diarrhoeal Disease Research, B, Dhaka, Bangladesh, ²IEDCR, Ministry of Health and Family Welfare, Dhaka, Bangladesh

In November 2007 a cluster of deaths was identified at a government hospital in northeastern Bangladesh. Patients presented with unconsciousness, elevated liver enzymes, and a history of repeated vomiting and restlessness. We investigated this outbreak in order to describe the clinical syndrome and determine etiology and risk factors for disease. We defined suspect cases as those experiencing vomiting and probable cases as vomiting and altered mental status in the outbreak areas from 2 to 11 November. We identified cases at hospitals and by house-to-house visits. In-depth interviews detailed illness histories and generated hypotheses about the etiology of disease. We conducted a cohort study in two villages to investigate risk factors for developing vomiting and unconsciousness, with a focus on foods consumed. In total, 81 patients were identified from 11 villages; 24% (19/81)

died. Cases resided in remote areas and were poor; many villagers reported eating only two meals per day. In-depth interviews with 33 cases showed that 31 (94%) had consumed *ghagra shak*, or cocklebur (*Xanthim strumarium*) in the hours before illness onset. Mature *ghagra shak* plants are usually consumed in these villages in small amounts to flavor foods or for medicinal purposes. However, due to severe and late flooding in 2007, villagers relied more upon uncultivated foods such as *ghagra shak*, and consumed very young plants. Persons who ate this plant were 28.9 (95% CI 9.2 to 90.8, P <0.001) times more likely than others to develop vomiting and unconsciousness during the outbreak. Consuming *X. strumarium* has caused similar illness and death in livestock and children in other parts of the world. The toxic agent in the plant is carboxyatroglicoside, which is found in the seeds and seedlings. Messages advising against consuming seedlings should be communicated broadly across the country and communities at risk for food scarcity should be targeted for food relief. This outbreak provides further example of how poverty and the lack of food security imperils lives.

1223

EFFECT OF READY-TO-USE-THERAPEUTIC FOOD SUPPLEMENTATION ON THE NUTRITIONAL STATUS, MORTALITY AND MORBIDITY OF CHILDREN 6 TO 60 MONTHS IN NIGER: A CLUSTER RANDOMIZED TRIAL

Sheila Isanaka¹, Nohelly Nombella², Ali Djibo³, Marie Poupard², Dominique Van Beckhoven², Valerie Gaboulaud², Philippe J. Guerin², Rebecca F. Grais²

¹Departments of Epidemiology and Nutrition, Harvard School of Public Health, Boston, MA, United States, ²Epicentre, Paris, France, ³Ministry of Health, Niamey, Niger

Ready-to-use-therapeutic foods (RUTF) are becoming an important component of the effective outpatient treatment of severe wasting. Their utility for prevention of wasting, however, has not been evaluated. Further, some findings of adverse health effects due to iron and folic acid supplementation suggest that iron supplementation in settings where the prevalence of malaria and other infectious diseases is high should be proceeded with cautiously. We evaluate the effect of a 3-month preventative supplementary feeding using RUTF on the nutritional status, mortality and morbidity of children 6 to 60 months. A cluster randomized trial of 12 villages in Maradi, Niger. Six villages were randomized to intervention and 6 to no intervention. Villages were visited monthly from August 2006 to March 2007. All children in the study villages between 6 and 60 mo of age were eligible for recruitment. The monthly distribution consisted of one packet per day of RUTF (PlumpyNut®, 500kcal/day) to each eligible child with weight-for-height ≥ 80% of the NCHS reference median from August to October 2006. Our main outcome was change in weight-for-height Z (WHZ) score according to the WHO Standards and incidence of wasting (WHZ < -2) over 8 months of follow up. The adjusted overall effect of the intervention on WHZ change was 0.18 Z (95% CI: 0.09, 0.27) over 8 mo. This effect was strongest in children 24 mo or younger at baseline. The intervention resulted in a 36% (95% CI: 20% - 49%) reduction in the incidence of wasting and a 57% (95% CI: 43% - 68%) reduction in the incidence of severe wasting. There was no evidence of increased risk of malaria associated with RUTF supplementation. There was a non-significant 49% reduction in mortality associated with the intervention. In conclusion, in a setting of acute food insecurity, short-term preventative supplementation with RUTF reduced the decline in WHZ and incidence of wasting and severe wasting. This study suggests that this product fortified with 11.5 mg of iron/100g did not aggravate malaria but further research is needed.

PATHOGENESIS OF HAEMORRHAGE ASSOCIATED WITH DENGUE INFECTION IN ADULTS IN VIETNAM

Dinh The Trung¹, Tran Tinh Hien², Le Thi Thu Thao², Nguyen Minh Dung², Tran Van Ngoc², Robert Goldin³, Edward Tuddenham⁴, Cameron Simmons⁵, Jeremy Farrar⁵, Bridget Wills⁵

¹University of Medicine and Pharmacy of Ho Chi Minh City, Ho Chi Minh city, Vietnam, ²Hospital for Tropical Diseases, Ho Chi Minh City, Vietnam, ³Department of Investigative Sciences, Imperial College, London, United Kingdom, ⁴Katherine Dormandy Haemophilia Centre and Thrombosis Unit University College, London, United Kingdom, ⁵Oxford University Clinical Research Unit, Hospital for Tropical Diseases, Ho Chi Minh City, Vietnam

The number of adults with severe dengue disease continues to increase in South-East Asia, as well as in South Asia and Latin American countries. Bleeding manifestations and severe liver involvement appear to be more common in adults than in children and may cause death. To date the pathogenesis of bleeding in dengue infections remains poorly understood, and there is little formal data comparing adult and paediatric patterns of disease. We present data from a prospective study of more than 600 adults representing the full spectrum of dengue disease admitted to a single hospital in Vietnam in 2006-7. Clinical and basic laboratory features will be described, with particular reference to bleeding manifestations and coagulation tests/platelet abnormalities, documented carefully throughout the evolution of the disease, and compared with similar observations from a group of children admitted to the hospital during the same dengue season. In addition to thrombocytopenia, an increase in activated partial thromboplastin time (APTT) and a reduction in fibrinogen levels were the two most consistent abnormalities detected, although typical DIC was unusual. Heparan sulfate (HS), a major constituent of the endothelial surface glycocalyx layer that is a known receptor for the dengue virus, is closely related to the therapeutic anticoagulant agent, heparin, and could function in a similar way to increase the APTT if released into the circulation. HS levels were measured in a subgroup of 200 of the adult dengue patients, and found to be markedly elevated; we will present data correlating HS levels with clinical severity and with the APTT derangement in support of this hypothesis. Secondly *in vivo* mammalian studies of intrinsic permeability indicate that despite its large size fibrinogen leaks from the microvasculature at a similar rate to the much smaller albumin molecule. Albumin leakage increases dramatically in patients with dengue shock syndrome. Using immuno-histochemistry we demonstrate interstitial leakage of fibrinogen in a series of 15 skin biopsies taken from among the adults with DSS, suggesting that leakage rather than consumption accounts for the low fibrinogen levels noted.

1225

IMPACT OF MASS AZITHROMYCIN TREATMENT ON THE PREVALENCE OF ACTIVE TRACHOMA AND OCULAR CHLAMYDIA TRACHOMATIS IN THE GAMBIA

Emma Harding-Esch¹, Martin J. Holland¹, Ansumana Sillah², Sandra Molina¹, Aura Aguirre-Andreasen¹, Paul Snell³, Tansy Edwards¹, Robin L. Bailey¹, David C. Mabey¹

¹London School of Hygiene and Tropical Medicine, London, United Kingdom, ²National Eye Care Programme, Banjul, Gambia, ³Medical Research Council Laboratories, Fajara, Gambia

Trachoma, caused by ocular serovars of *Chlamydia trachomatis* (CT), is the leading infectious cause of blindness. Antibiotic treatment is part of the WHO control strategy and The Gambia has qualified for a donation of azithromycin by Pfizer. We report the prevalence of active trachoma and ocular CT before and one year after mass azithromycin treatment in The Gambia. At both baseline and follow-up, children aged 0-9 years in 6 villages were screened for trachoma clinical signs according to the WHO simplified grading system. Ocular specimens were taken from each child's right eye and processed by Amplicor PCR for the second-collected swab of baseline samples, and the first-collected swab of follow-up samples.

Mass treatment was conducted after baseline screening. At baseline 280/1171 children (23.9%) had active trachoma and 35 (3.0%) were PCR positive. At follow-up 207/1175 children (17.6%) had active trachoma and 45 (3.8%) were PCR positive. After treatment the prevalence of active trachoma decreased in all villages although in one village the difference was insignificant ($p=0.952$). There was no evidence of CT infection in 2 villages at follow-up, and only one PCR positive case in 2 other villages. However, 2 villages had higher CT prevalence at follow-up than at baseline. WHO policy is to mass treat annually for 3 years any community where the prevalence of active trachoma in children aged 1-9 years is $\geq 10\%$. At baseline, all 6 villages qualified for mass treatment and at follow-up all but one village still had $\geq 10\%$ prevalence. However, CT prevalence was low indicating that these villages may be unnecessarily receiving treatment, thus wasting scarce resources. The higher CT prevalence at follow-up than at baseline may be explained by low treatment coverage (51.0%) in one village, but not in the other (93.6%). Another explanation is that of cross-border re-infection from Senegal, as has previously been reported. Antibiotic treatment should therefore be conducted over a wide geographical area to limit re-infection from occurring. Investment in the long-term "F" and "E" components of the SAFE strategy is also important if trachoma elimination is to be maintained in The Gambia.

1226

EXTRA-HEPATIC CYSTIC HYDATID DISEASE: A DIAGNOSTIC DILEMMA?

Parsotam R. Hira¹, Faiza Al-Ali², Fathma A. Al-Shelahi², Nabila Khalid¹, Nadia A. Al-Enezy³, Santosh Hebbar⁴, Deena Al-Rifai⁵, Mehraj Sheikh⁶

¹Department of Microbiology, Faculty of Medicine, Kuwait City, Kuwait, ²Department of Laboratories, Farwaniya Hospital, Kuwait City, Kuwait, ³Department of Laboratories, Mubarak Al-Kabeer Hospital, Kuwait City, Kuwait, ⁴Department of Radiology, Farwaniya. Hospital, Kuwait City, Kuwait, ⁵Department of Radiology, Farwaniya. Hospital, Farwaniya, Kuwait City, Kuwait, ⁶Department of Radiology, Faculty of Medicine, Kuwait City, Kuwait

Cystic hydatid disease (CHD), a zoonosis due to the metacestode of the canine tapeworm *Echinococcus granulosus* is endemic in parts of the sheep-rearing areas of the Middle East, including Kuwait. CHD of the liver, with the presenting triad of symptoms of abdominal pain, a palpable mass and jaundice is well documented. However, man being an aberrant host, a variable proportion of the cysts develop extra-hepatically giving rise to non-specific symptoms, resulting in delayed or misdiagnosis. The magnitude of the problem of extra-hepatic cysts, and the consequent difficulties in diagnosis has yet to be defined and may be an underestimate in endemic countries, including Kuwait. We first describe patients presenting with extra-hepatic CHD to show the variety of unusual presentations and the difficulties in laboratory diagnosis. We discuss such cyst/s in the lung in a Saudi female; in the posterior triangle of the neck in a female Kuwaiti and in the breast in another; in the brain and heart in a Syrian male and in the pelvis in a Bangladeshi male. The diagnosis in each was confirmed by serology, presence of scolices and hooks after nucleopore filtration of aspirated fluid and/or histopathology of sectioned cysts. We then show that of a total of 1201 patients, CHD was diagnosed in 198 (16.5%); 155 (78.3%) had cysts in the liver but in 39(19.7%) they were extra-hepatic. In four patients (2%), cysts were both in the liver and extra-hepatic too. The number of patients with extra-hepatic cysts will vary in each endemic zone depending on the phenotypic and genotypic variability of the parasite. The G1 strain involving dogs/sheep rather than camels/sheep is predominant in this endemic area influencing the site of location of hydatid cysts in man. We elaborate on the mode of transmission which also influences the target organ in each geographic area. Indeed our data may not reflect the true magnitude of the problem as a whole body scan was not performed either on those with hepatic or extra-hepatic cyst. Even with the advent of imaging studies, the availability of serology and the increased use of fine-needle aspiration cytology, we

show that diagnosis of extra-hepatic CHD is fraught with difficulties. Such data are essential for the attending physician to make an informed judgment and to differentiate CHD from masses like tumours, congenital, simple and other cystic lesions which we encountered and enumerate in our extensive list from this geographic locale.

1227

SEROPREVALENCE OF *STRONGYLOIDES* IN NEWLY ARRIVED IMMIGRANTS AND REFUGEES

Christina A. Greenaway¹, J. Dick MacLean², Brian J. Ward³, Momar Ndao³

¹SMBD Jewish General Hospital, Montreal, QC, Canada, ²McGill University Centre for Tropical Diseases, Montreal, QC, Canada, ³National Reference Centre for Parasitology, Montreal, QC, Canada

Strongyloides stercoralis is an intestinal parasite that is highly endemic in tropical countries with reported seroprevalence ranging in immigrants from 1-75% depending on their country of origin, immigration class, and the diagnostic method used. A large proportion of newly arrived immigrants and refugees may be asymptotically infected with strongyloides for life. Such chronic infections put these individuals at risk for disseminated disease (associated with high mortality) and that could be prevented through targeted screening or empiric treatment programs. A total of 1294 foreign-born adults (≥18 years), having lived ≤5 years in Canada were recruited from 2 hospitals and 3 clinics in Montreal, between October 2002 and December 2004. Socio-demographic information was collected via a questionnaire. Antibodies to recombinant *Strongyloides stercoralis* NIE antigen [Optical density (OD) <0.35=negative, ≥ 0.35-0.45=low positive, >0.45-0.75=moderately positive, >0.75=high positive] and antibodies to *Brugia malayi* antigen (OD <0.3=negative, ≥ 0.3-0.4=low positive, >0.4-0.7=moderately positive, >0.7=high positive) were detected by ELISA. The mean age was 33 ± 8.8 years (range 18-76), 66% were female, 49% were refugee or refugee claimants and 47% had a university degree. A large portion of the patient population had antibodies to strongyloides 27% (95% CI, 22-32%) and ranged in 6 different geographic regions from 17%-41%. A total of 11% (146/1294) of the study population had positive filaria serology and 19% (67/350) of all patients with positive strongyloides serology also had positive filaria serology, suggesting some cross reactivity and/or dual infection. In preliminary multivariate analysis, positive strongyloides serology was more common in men than women [OR, 95%CI; 1.8, (1.2-2.1)], in refugees vs immigrants [1.4 (1.01-1.9)], in those with moderately positive filaria serology [3.3 (1.9-5.7)], or high positive filaria serology [2.4 (1.01-5.5)] vs those with negative serology, and within several world regions after adjusting for the variables noted above as well as age and several socioeconomic factors. In conclusion, a large proportion of adult immigrants and refugees in the Montreal area are infected with strongyloides and are at risk for disseminated disease. These individuals would likely benefit from targeted screening programs and or empiric treatment.

1228

PHENOTYPIC AND GENOTYPIC EVIDENCE OF EMERGING IVERMECTIN RESISTANCE IN ONCHOCERCIASIS

Mike Y. Osei-Atweneboana¹, Simon K. Atta², Kwablah Awadzi³, Daniel A. Boakye⁴, John O. Gyapong⁵, Roger K. Prichard¹

¹McGill University, Ste. Anne-De-Bellevue, QC, Canada, ²Onchocerciasis Chemotherapy Research Center, Hohoe, Ghana, ³Onchocerciasis Chemotherapy Research Center, Hohoe, Ghana, ⁴Noguchi Memorial Institute for Medical Research, Accra, Ghana, ⁵Health Research Center, Ghana Health Services, Accra, Ghana

Onchocerciasis, commonly known as "River blindness" is a disease affecting over 37 million people, primarily in Africa. Ivermectin, the only drug for mass treatment is showing reduce efficacy to adult *Onchocerca volvulus*, the causative agent of the disease. We have carried out a 21

month longitudinal study, on 301 subjects from 10 Ghanaian communities that have received between 7- 20 rounds of IVM treatment, to assess the microfilaricidal effect of ivermectin and its impact on adult female worm reproductive status. Nodulectomies were carried out on 140 subjects three months after the last IVM treatment. Embryogrammes were constructed on all intact female worms. We observed significant differences in these communities in terms of worm burdens, female worm production of various embryonic stages and production of intra-uterine stretched mf. From this data, we have classified communities into three responses group. Three communities showed poor response, two were moderate responders and five communities, including a previously IVM naïve community, were good responders. B tubulin isotype 1 gene has been shown to be linked to IVM selection in *O. volvulus* and also associated with IVM resistance in veterinary nematodes. We have genotyped the full length genomic DNA for β-tubulin of 284 *O. volvulus* adult worms obtained from all response groups. We observed single nucleotide polymorphisms (SNPs) at 21 sites on the entire 3696 bp gene. Of these, seven occurred in exons, one translating into an amino acid change, while 14 occurred in introns; of particular interest were the changes in the first intron. We observed significance differences (P< 0.03) between the three response groups at five SNPs occurring in both exons and introns. The phenotypic and genotypic evidence indicates that IVM resistance is being selected and is manifested as a loss of effect of IVM on suppression of parasite reproduction. B-tubulin may be a useful genetic marker for the selection of IVM resistance.

1229

CO-CULTURE WITH *PLASMODIUM FALCIPARUM*-INFECTED RED BLOOD CELLS INDUCES DIFFERENTIATION OF FUNCTIONALLY COMPETENT REGULATORY T CELLS FROM LYMPHOCYTES OF MALARIA-NAÏVE DONORS

Olivia Finney¹, Emma Lawrence², Judith Satoguina³, David Conway³, Eleanor Riley¹, Michael Walther³

¹LSHTM, London, United Kingdom, ²Manchester University, Manchester, United Kingdom, ³MRC, Banjul, Gambia

An important aspect of clinical immunity to malaria is the ability to down-regulate inflammatory responses once parasitaemia is under control, in order to avoid host-mediated pathology. Previously, we found that regulatory T cells (Tregs) are upregulated in response to sporozoite challenge in malaria naïve volunteers, leading to reduced pro-inflammatory responses and enhanced parasite growth. More recently we found that natural exposure to malaria may induce a transient increase in the number of functional Tregs: increased percentages and absolute numbers of CD4⁺Foxp3⁺CD127^{low} T cells were found in individuals living in a rural village with stable malaria transmission than in individuals living in an urban area where malaria rarely occurs. Moreover, in the same rural population, levels of FOXP3 mRNA were higher at the end of the malaria transmission season than at the end of the dry season 6 months later. In the present study we demonstrate that functionally active Tregs can be induced *in vitro*, in a dose dependent manner, by co-culture with *P. falciparum* schizont extract or viable parasitized red blood cells. Depletion of CD25⁺ T cells prior to co-culture abrogates this effect suggesting either that natural Tregs are the precursors of the induced population or that their presence is required for induction to take place. Tregs express very high levels of Fas (CD95), and low levels of Bcl2 both *ex-vivo* and after induction *in vitro*, suggesting they are prone to undergo apoptosis. This would explain the transient increase in this population observed *in vivo* after exposure to malaria. Ongoing studies addressing the role of apoptosis in the fate of malaria-induced Tregs *in vitro* will be presented.

FUNCTIONAL RELATIONSHIP BETWEEN IL-1 β PROMOTER HAPLOTYPES (-31C/T AND -511A/G) AND PEDIATRIC SEVERE MALARIAL ANEMIA

Collins Ouma¹, Tom Were¹, Greg Davenport², Christopher Keller³, Samuel Anyona¹, Henry Ndege¹, Michael Otieno⁴, John Vulule⁵, Jeremy Martinson², Robert Ferrell², John Michael Ong'echa¹, Douglas Perkins⁶

¹University of New Mexico/KEMRI, Kisian, Kenya, ²University of Pittsburgh, Pittsburgh, PA, United States, ³Lake Erie College of Osteopathic Medicine, Erie, PA, United States, ⁴Kenyatta University, Nairobi, Kenya, ⁵KEMRI, Kisian, Kenya, ⁶University of New Mexico, Albuquerque, NM, United States

Interleukin (IL)-1 is an important inflammatory mediator in *Plasmodium falciparum* infections. Although the inflammatory profile associated with protection against severe malarial anemia (SMA) is largely undefined, increased IL-1 β production appears to limit parasitemia. Previous studies showed associations between individual IL-1 β promoter variants (-31C/T and -511A/G) and malaria disease severity. To further examine the role of IL-1 β promoter variants in conditioning malaria disease outcomes, the relationship between -31C/T and -511A/G haplotypes, SMA (Hb<6.0g/dL), high-density parasitemia (HDP; >10,000 parasites/ μ L) and circulating IL-1 β was investigated in children with acute malaria (n=566) residing in a holoendemic *P. falciparum* transmission area. Hematological and parasitological profiles were determined in all study participants. IL-1 β -31C/T genotyping was carried out by PCR and *AluI* restriction enzyme digestion, while -511A/G genotypes were determined using a Taqman 5-allelic discrimination assay. Circulating IL-1 β concentrations were determined using the Cytokine 25-plex assay. Frequencies of -31C/-511A, -31C/-511G, -31T/-511A and -31T/-511G haplotypes were 87.2%, 29.1%, 2.1%, and 30.9%, respectively. Multivariate logistic regression analyses controlling for age, gender, sickle-cell trait, HIV-1, and bacteremia revealed that -31C/-511A was associated with increased risk of SMA (OR; 1.98, 95% CI, 1.55-2.27; P<0.05) while -31T/-511A was non-significantly associated with protection against SMA (OR; 0.52, 95% CI, 0.18-1.16; P=0.11). Consistent with these observations carriage of CA and TA haplotypes was associated with reduced (P<0.05) circulating and elevated (P<0.05) IL-1 β production, respectively. Additionally, IL-1 β levels were lower in SMA compared to non-SMA children. These results demonstrate that variation in the IL-1 β promoter conditions susceptibility to SMA and functional changes in circulating IL-1 β levels.

INHIBITION OF ANCYLOSTOMA CEYLANICUM MACROPHAGE MIGRATION INHIBITORY FACTOR (ACEMIF): POTENTIAL FOR PREVENTING HOOKWORM-ASSOCIATED IMMUNOMODULATION AND DISEASE PATHOGENESIS

Jon J. Vermeire¹, Yoonsang Cho², Lin Leng³, Elias Lolis², Richard Bucala³, Michael Cappello¹

¹Program in International Child Health and Department of Pediatrics, Yale University School of Medicine, New Haven, CT, United States, ²Department of Pharmacology, Yale University School of Medicine, New Haven, CT, United States, ³Department of Medicine, Yale University School of Medicine, New Haven, CT, United States

Hookworms, parasitic nematodes that infect nearly one billion people worldwide, are a major cause of anemia and malnutrition. We hypothesize that hookworms actively manipulate the host immune response through the elaboration of specific molecules at the host-parasite interface designed to facilitate infection by larval stages and adult worm survival within the small intestine. Full-length cDNAs encoding two orthologs of the human cytokine, Macrophage Migration Inhibitory Factor (MIF) have been cloned from the hookworm *Ancylostoma ceylanicum*. Elucidation of the three dimensional crystal structure of recombinant AceMIF-2 (rAceMIF-2) revealed an overall structural homology with significant differences in the tautomerase sites of the human and hookworm

proteins. The relative bioactivities of human and hookworm MIF were compared using *in vitro* assays of tautomerase activity, monocyte migration, and binding to the MIF receptor, CD74. These data provide evidence that the hookworm-derived AceMIF molecules are bioactive and functional orthologs of human MIF. Vaccination of laboratory animals using purified rAceMIF-2 was associated with partial protection against anemia and growth delay following challenge infection, compared to adjuvant immunized controls. Selective *in vitro* inhibitors of rAceMIF activities were identified using high-throughput screening (HTS) of a small molecule library representing previously defined biologically active compounds. In summary, based on its unique immunological, structural, and functional characteristics, AceMIF is a viable target for novel drug and/or vaccine based strategies for selectively inhibiting these hookworm cytokine orthologs as a means of reducing parasite survival and disease pathogenesis *in vivo*.

PATENT FILARIAL INFECTION MODULATES MALARIA-SPECIFIC TYPE 1 CYTOKINE RESPONSES IN AN IL-10 DEPENDENT MANNER IN A FILARIA/MALARIA CO-INFECTED POPULATION

Simon Metenou¹, Benoit Dembele², Siaka Konate², Housseini Dolo², Lamine Soumaoro², Abdallah A. Diallo², Michel E. Coulibaly², Siaka Y. Coulibaly², Dramane Sanogo², Yaya I. Coulibaly², Sekou F. Traore², Amy Klion¹, Thomas B. Nutman¹, Siddhartha Mahanty¹

¹National Institutes of Health, Bethesda, MD, United States, ²Filaria Unit, FMPOS, University of Bamako, Bamako, Mali

Human co-infection with malaria and filarial parasites is common in regions of Africa and particularly in Mali where both *Plasmodium falciparum* (Pf) and *Wuchereria bancrofti* (Wb) are transmitted by the same mosquito vector. As filarial infections can modulate responses to bystander antigens, we investigated the effect of filarial infections on malaria-specific immune responses. Blood samples were collected from individuals with Wb and/or *Mansonella perstans* (Mp) infections (Fil+; n=19), as determined by a Wb Ag capture ELISA and/or circulating microfilariae (Mf), and those with no evidence of active filarial infections (Fil-; n=20) from the same village. Whole blood samples were cultured *in vitro* with Pf-infected red blood cell lysate [MalAg] or *Brugia malayi* adult antigen (BmA) or medium alone for 24 hrs. The supernatants were assayed for IL-2, IL-4, IL-6, IL-10, IL-12p70, IL-17A, IP-10, TNF- α and IFN- γ by LuminexTM. Compared to the Fil- group, Fil+ individuals had significantly higher levels of IL-10 (p = 0.027) and IL-17A (p = 0.037) produced spontaneously. The Fil+ group also mounted a significantly lower IL-12p70 (GM 1.11 vs. 3.20 pg/ml, p=0.022), IFN- γ (4.77 vs. 17.32 pg/ml p = 0.06) and IP10 (34.46 vs. 261.1 pg/ml p = 0.0023) responses following MalAg stimulation but a significantly higher IL-10 response (7541 pg/ml vs. 3198 pg/ml, p = 0.022) compared to the Fil- group. In contrast, BmA induced significantly higher levels of IL-2 and IL-4 in Fil- than in Fil+ individuals. To understand the role played by either IL-10 or TGF- β in the regulation of Type 1 responses to MalAg in filarial infections, neutralizing antibodies to IL-10 and/or TGF- β were utilized *in vitro*. Whereas, anti-TGF- β had little effect on preventing the MalAg specific downregulation, anti-IL10 antibodies induced a significant reversal of IL-12p70, IFN- γ , and IP10 (p<0.001). Blocking both IL-10 and TGF- β together did not augment the responses seen with IL-10 blockade alone. Taken together these data demonstrate that filarial infections clearly modulate the Pf-specific IL-12p70-IFN- γ pathway known to play a key role in resistance to malarial parasites and do so in an IL10-dependent manner. Flow cytometric analysis is currently underway to determine if Pf-specific Type 1 response modulation extends to the level of CD4+ T cell frequencies of effector or regulatory cells.

1233

CO-INFECTION WITH HELMINTHS AND MALARIA DURING PREGNANCY EFFECT SUSCEPTIBILITY TO FALCIPARUM MALARIA DURING CHILDHOOD

Indu Malhotra¹, Peter Mungai¹, Alex Wamachi², John Ouma³, Davy Koech², Eric Muchiri⁴, Christopher L. King¹

¹Case Western Reserve University, Cleveland, OH, United States, ²Kenya Medical Research Institute, Nairobi, Kenya, ³Kenyatta University, Nairobi, Kenya, ⁴Division Of Vector Borne Diseases, Nairobi, Kenya

We have previously observed that a subset of offspring of malaria infected pregnant women fail to acquire fetal priming to malaria blood stage antigens *in utero*. These putatively tolerant children were more susceptible to malaria during childhood. Since co-infections with helminths and malaria are common in developing countries we hypothesize that helminth co-infection during pregnancy may down modulate fetal immune responses to blood-stage malaria antigens. To examine the impact of helminths (schistosomiasis, lymphatic filariasis and/or hookworm) on malaria susceptibility we undertook a prospective cohort study of 705 newborns in a malaria endemic region of Kenya in which children were examined every 6 months from birth to 4 years of age for *Plasmodium falciparum* infection and the presence of malaria antigen-specific T cell responses. Overall 26% of the pregnant women were co-infected with helminths and malaria, 16% with malaria and 34% with helminths alone. There was a 2-3 fold increase in risk of malaria infection in offspring of women with mixed helminth and malaria infection compared to offspring of women without either infection ($p < 0.01$) as measured by frequency of blood smear and PCR positivity at 12, 18 and 30 months of age. Similarly, offspring of women with mixed infection had significantly reduced hemoglobin levels at 12 months of age (geomean = 7.7g/dL, $p = 0.02$) compared to offspring of women with single infection. The increased susceptibility to malaria infection in offspring of women with mixed infection was associated with >2-fold reduced malaria-antigen-driven IFN- γ production by peripheral blood mononuclear cells compared to offspring of women infected with malaria or helminths alone ($p = 0.01$). Thus, helminth co-infections during pregnancy may induce an immunomodulatory fetal response resulting in impaired fetal priming to malaria *in utero* that could enhance the risk for malaria infection during infancy. Treatment of women for helminth infections during pregnancy may have a beneficial effect on malaria susceptibility in childhood.

1234

IDENTIFICATION AND CLONING OF BABOON TLF WHICH KILLS HUMAN INFECTIVE AFRICAN TRYPANOSOMES IN VIVO

Russell Thomson

New York School of Medicine, New York, NY, United States

African trypanosomiasis remains a scourge of public health and an obstacle to agricultural and economic development in sub-Saharan Africa. In humans the disease is caused by infection with *T. brucei rhodesiense* in east Africa and *T. brucei gambiense*, in west Africa. Cattle and other domestic animals are a major reservoir of *T. b. rhodesiense*. *T. brucei brucei* causes disease in cattle and other animals but cannot infect a subset of primates due to trypanosome lytic factors (TLFs) present in their serum. Human TLFs are high density lipoprotein complexes that contain Haptoglobin related protein (Hpr) and apolipoprotein L-I (apoL-I). Haptoglobin related protein forms part of a ligand (Hpr-Hb) that enhances the uptake of TLF. Apolipoprotein L-I is a pore forming protein that becomes active in acidic conditions and forms pores in the lysosome membrane. Human TLFs cannot kill *T. b. rhodesiense* due to the acquisition of SRA. Baboon sera and purified HDL can kill human infective *T. brucei*, confirming that baboon and human TLFs are different. To identify the trypanolytic component of baboon serum we purified TLF and analysed the protein components using Tandem mass-spectrometry. The peptide sequences obtained were used to clone two cDNAs encoding proteins with homology to human TLF components. Using a

hydrodynamic-based transgenic mouse model we show that expression of the cDNA clones confers TLF activity on mouse HDLs and protects mice from infection with both animal and human infective *T. brucei*. We propose that the production of baboon TLF transgenic cattle could be used to generate healthier livestock and reduce the transmission of human sleeping sickness in east Africa.

1235

UNEXPECTED TRNA ENCODED WITHIN THE MITOCHONDRIAL 12S RRNA OF TRYPANOSOMA BRUCEI

Melissa Lerch, Matt Beverly, Ken Stuart, Steve Hajduk

Seattle Biomedical Research Institute, Seattle, WA, United States, University of Georgia, Biochemistry and Molecular Biology Department, Athens, GA, United States

Typically mitochondria encode all of the transfer RNAs (tRNA) necessary for autonomous protein synthesis. However kinetoplastids, a protozoan parasite, have one of the smallest mitochondrial genomes and require unique modifications such as RNA editing to produce translatable mRNA. The kinetoplast maxicircle DNA (kDNA), which encodes the mitochondrial genome, is compact and contains little to no intergenic regions where most mitochondrial tRNAs are encoded. To date, there has been no evidence for tRNAs encoded within the mitochondrial kDNA, rather a full set of tRNAs are imported from the cytosolic pool of tRNAs. Analysis of the *T. brucei* nuclear genome with tRNAscan-SE verified this expectation and we identified genes for most of the tRNAs. However the tRNAPhe(AAA) was not detected. This was surprising since the UUU codon is the most abundant in mitochondrial mRNA due in part to uridine insertion during RNA editing. While third position wobble base pairing with the UUU codon would allow other phenalanine tRNAs to substitute for the tRNAPhe(AAA), there is one duplicated tRNAPhe(GAA) identified in the nuclear genome. We repeated the tRNAscan-SE analysis on maxicircle kDNA allowing for low covariance model values that are common for mitochondrial tRNAs. The most promising candidate for tRNA^{Phe(AAA)} contained an unusually large intron and is encoded within the 12S rRNA. We have demonstrated the existence of this processed tRNA using 1D- and 2D- denaturing urea-polyacrylamide gels and northern blotting with probes specific for the tRNA. We can also demonstrate that these tRNAs retain their aminoacylation when isolated under acidic conditions and upon basic treatment aminoacylation is lost. Studies are underway to sequence and further characterize this unusual mitochondrial tRNA.

1236

VALIDATION OF PLASMODIUM FALCIPARUM ISOLEUCYL TRNA SYNTHETASE AS A DRUG TARGET

Eva S. Istvan, Daniel E. Goldberg

Washington University School of Medicine, St. Louis, MO, United States

Intraerythrocytic *Plasmodium falciparum* has minimal capability for amino acid synthesis. Amino acids are obtained via hemoglobin degradation and via uptake from the extracellular environment. Parasites are able to grow with isoleucine as the sole exogenous amino acid, relying on hemoglobin degradation for most of their needs (isoleucine is the only amino acid absent in human hemoglobin). Malaria parasites may be especially sensitive to perturbation of isoleucine uptake and/or utilization.

tRNA synthetases couple amino acids to their cognate tRNAs. Two isoleucyl tRNA synthetases (IRSs) are predicted in the *Plasmodium* genome, one cytoplasmic and one containing a putative apicoplast targeting signal. Mupirocin is a compound produced by *Pseudomonas fluorescens* and is used clinically for methicillin-resistant *Staph. aureus*. Mupirocin resembles the Ile-AMP transition state complex and has been shown to act as a competitive inhibitor of bacterial and archeal IRSs. We determined that mupirocin is a potent anti-malarial compound and kills parasites at nanomolar concentrations. Parasites are killed with "delayed-death" kinetics. Inhibition by mupirocin is attenuated by high isoleucine medium.

To show that mupirocin acts on the apicoplast-located IRS, we selected parasites resistant to mupirocin. Sequencing of cloned mupirocin-resistant parasites revealed a C to T change at nt 4034 of the predicted apicoplast IRS. This mutation results in an amino acid change of Pro1233 to Ser. Pro1233 is completely conserved in IRSs and is proximal to the active site.

1237

PROBING CENTRAL CARBON METABOLISM IN PLASMODIUM FALCIPARUM

Kellen Olszewski¹, Joshua D. Rabinowitz², Manuel Llinás¹

¹*Molecular Biology and Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, United States*, ²*Chemistry and Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, United States*

Despite decades of study, central carbon metabolism in the Plasmodia remains poorly understood. Early microscopic and biochemical observations suggested that blood-stage Plasmodia possess a minimal mitochondrion with limited respiratory capacity that does not contribute to energy generation. However, recent whole-genome sequences and transcriptional profiling experiments have revealed that potential homologs to all the necessary tricarboxylic acid (TCA) cycle enzymes are both encoded by the plasmodial genome and coordinately expressed during the trophozoite stage, strongly implying that some variant of the TCA cycle is active during asexual development. Several of these predicted enzymes have been confirmed biochemically or localized to the mitochondrion; however, the principal carbon source(s), directionality and ultimate role of the TCA cycle have not been established. We have used HPLC-MS/MS-based metabolomics and stable isotope-labeled nutrients to trace carbon flux through TCA cycle intermediates in *in vitro* cultures of *Plasmodium falciparum* (3D7 strain). Our data confirm the previously suggested disconnect between glycolysis and TCA metabolism and suggest an acyclic model in which glutamine and glutamate are the principal carbon sources and two discrete pathways act to generate energy, redox balance and biosynthetic intermediates. These results shed light on one of the most divergent examples of eukaryotic carbon metabolism and have implications for the effective design of therapeutic interventions.

1238

RAPID MEMBRANE DISRUPTION BY A PERFORIN-LIKE PROTEIN FACILITATES PARASITE EXIT FROM THE HOST CELL

Björn F.C. Kafsack¹, Janethe D. O. Pena³, Isabelle Coppens², Sandeep Ravindran⁴, John C. Boothroyd⁴, Vern B. Carruthers¹

¹*Department of Microbiology and Immunology, University of Michigan Medical School, Ann Arbor, MI 48109, United States*, ²*Department of Molecular Microbiology and Immunology, Johns Hopkins Bloomberg School of Public Health, United States*, ³*Department of Immunology, Universidade Federal de Uberlândia, Uberlândia, Brazil*, ⁴*Department of Microbiology and Immunology, Stanford University School of Medicine, Stanford, CA, United States*

The MACPF domain owes its name to the pore-forming proteins of the mammalian immune system where it is found in the final components of the complement cascade that form the membrane attack complex and in perforin released by cytolytic effector cells. Widespread genome sequencing in combination with recent crytolographic studies has revealed that the MACPF-fold is of ancient origin and expressed by many bacterial and protozoan pathogens. Within the Apicomplexa we found two or more MACPF family member proteins in most members of the phylum for which genome sequencing is available with a notable exception being *Cryptosporidium*. Our work on the *Toxoplasma* Perforin-Like Protein 1 (TgPLP1) revealed a 1151aa secretory protein containing an N-terminal propeptide, a well-conserved MACPF domain, and a predicted C-terminal beta sheet-rich domain. Antibodies raised against TgPLP1 allowed its localization to the micronemes of tachyzoites and confirmed its

secretion in response to calcium agonists. A TgPLP1-null strain displayed no noticeable *in vitro* growth defect but was severely attenuated *in vivo*. Closer examination revealed a defect in ionophore-induced egress from host cells despite an activation of gliding motility similar to wild-type levels. Additionally, the TgPLP1-null strain is severely impaired in its ability to permeabilize either the parasitophorous vacuolar membrane or the host plasma membrane following ionophore treatment of cytochalasin D-paralyzed vacuoles. Co-infection of host cells with wild-type and TgPLP1-null strains showed that egress of a WT vacuole was able to complement both the egress and permeabilization defects of the mutant vacuole. This marks the first time a secreted *Toxoplasma* protein has been shown to play a central role in egress.

1239

A CALCIUM DEPENDENT PROTEIN KINASE MODULATES MICRONEME SECRETION IN TOXOPLASMA GONDII

Sebastian Lourido

Washington University School of Medicine, St. Louis, MO, United States

Apicomplexans rely on calcium as a second messenger to regulate motility, secretion, invasion and differentiation. Understanding calcium signal transduction is essential to elucidating the molecular mechanisms controlling these functions. Calcium dependant protein kinases (CDPKs) have been shown to respond to calcium, and genetic evidence in *Plasmodium* confirms their role in gametocyte exflagellation and ookinete motility. However, the basic pathways controlled by these kinases remain poorly understood, as does their role in other apicomplexans. Four canonical CDPKs conserved among apicomplexans are expressed in *Toxoplasma gondii* tachyzoites. Of these, TgCDPK1 and TgCDPK3 form a distinct phylogenetic lineage, sharing multiple characteristics. Both proteins are predicted to be N-terminal acylated and we show that these motifs are crucial for membrane localization of TgCDPK3. Additionally, both proteins are deposited in trails of gliding parasites, similarly to various components of the gliding machinery. To further examine the function of these CDPKs, we generated conditional inducible mutants employing the published tetracycline transactivator system. We successfully created a conditional TgCDPK1 mutant and have characterized its phenotype. When grown in the presence of anhydrotetracycline, mutant parasites grew normally and formed large stable vacuoles, suggesting an egress defect. When mechanically dissociated, the mutant parasites showed decreased adhesion and invasion into host cells, and reduced lytic ability in a monolayer growth assay. Reminiscent of mutations in certain microneme proteins, these phenotypes suggested a potential defect in secretion. Consistent with this hypothesis, we observed that TgCDPK1 mutants failed to secrete MIC2 in response to induction by ethanol, a potent agonist. These results suggest that TgCDPK1 may be activating microneme secretion, thus forming a critical signaling link downstream of calcium in this essential pathway.

1240

THE ROLE OF TNF AND MYD88 IN THE INDUCTION OF B CELL PATHOLOGY FOLLOWING TRYPANOSOMA BRUCEI INFECTION

Viki Bockstal¹, Patrick Guirnalda¹, Deborah Frenkel¹, Stefan Magez², Samuel Black¹

¹*Department of Veterinary and Animal Sciences, University of Massachusetts, Amherst, MA, United States*, ²*Laboratory of Cellular and Molecular Immunology, Department of Molecular and Cellular Recognition, Flanders Interuniversity, Institute for Biotechnology (VIB), Vrije Universiteit Brussel, Brussel, Belgium*
Experimental *T. brucei* infections in C57Bl/6 mice cause a severe defect in B lymphopoiesis in the bone marrow and show a depletion of splenic transitional T1 (AA4.1+, B220+, IgMhi, CD23-), T2 (AA4.1+, B220+, IgMhi, CD23+) and T3 (AA4.1+, B220+, IgMlo, CD23-) B lymphocytes in addition to the depletion of mature marginal zone (MZ) and follicular

(Fo) B cells. The decline in bone marrow B lymphopoiesis in infected mice appears to result from expulsion of B cell progenitor populations out of the bone marrow into the spleen as it was mirrored by an increase in common lymphoid progenitors (CLP; Lin⁻, AA4.1⁺, IL-7⁺), pre-pro-B (Lin⁻, IgM⁻, CD19⁻, AA4.1⁺, B220⁺), pro-B (Lin⁻, IgM⁻, CD19⁺, AA4.1⁺, B220⁺, CD43^{hi}) and pre-B (Lin⁻, IgM⁻, CD19⁺, AA4.1⁺, B220⁺, CD43^{lo/-}) in the spleen. In contrast, the loss of bone marrow immature B cells (Lin⁻, CD43^{lo/-}, AA4.1⁺, CD19⁺, B220⁺, IgM⁺) and splenic transitional B cells appears to result from apoptosis. To define the mechanisms underlying *T. brucei* AnTat 1.1E induced B cell pathology, infections were established in TNF and MyD88 gene-deficient mice. Both the loss of developing B cell populations pre-pro-B, pro-B, pre-B and immature B from the bone marrow and the infiltration of these precursor populations in the spleen was significantly less pronounced in infected TNF^{-/-} mice as compared to in the wild type mice and MyD88^{-/-} mice. Interestingly, during infection the depletion of transitional B cells was not only rescued in TNF^{-/-} mice but also appeared to a much lesser extent in MyD88^{-/-} mice as compared to infected wild type mice. Finally, only in MyD88^{-/-} mice reduced B cell pathology was observed with respect to the loss of FoB cells. In conclusion we show here that two important components of the innate immune system, TNF and MYD88, are involved in the induction B cell pathology during *T. brucei* infection and that at least 3 different processes, one TNF-dependent, one TNF-and MYD88-dependent and one MYD88-dependent, are responsible for respectively the loss of B lymphopoiesis from the bone marrow and the depletion of transitional B cells and FoB cells.

1241

NEUTROPHILS ARE THE PREDOMINANT INITIAL HOST CELL FOR LEISHMANIA MAJOR AND ARE ESSENTIAL FOR THE ESTABLISHMENT OF SAND FLY TRANSMITTED INFECTION

Nathan C. Peters¹, Jackson G. Egen², Naglia Secundino¹, Alain Debrabant³, Nicola Kimblin¹, Shaden Kamhawi¹, Phillip Lawyer¹, Ronald N. Germain², David Sacks¹

¹Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, United States, ²Laboratory of Immunology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, United States, ³Division of Emerging and Transfusion Transmitted Diseases, OBRB, CBER, Food and Drug Administration, Bethesda, MD, United States

Infection with the obligate intracellular protozoan *Leishmania* is thought to be initiated by direct parasitization of macrophages, but the early events following transmission to the skin by vector sand flies have been difficult to examine directly. Employing 2-photon intra-vital microscopy and flow cytometry, we observed a rapid and sustained neutrophilic infiltrate directed towards localized bite sites and subsequent phagocytosis of *L. major*. Neutrophils ultimately defined the sand fly bite site by creating a neutrophil "plug" at the location of proboscis penetration in the skin. The formation of the neutrophil plug occurs with both infected and uninfected sand flies, suggesting that the wound response to sand fly bite is the primary driving factor in acute neutrophil recruitment. Recruited neutrophils, not macrophages, were the predominant host cell during the first 24 hours of infection following needle inoculation, and neutrophils contained viable parasites that could be propagated in culture. Following adoptive transfer of infected neutrophils into the ear dermis of naïve mice, neutrophil derived parasites established disease as efficiently as infectious parasites obtained from culture. Between 24-72 hours of infection, *L. major* parasites transitioned from neutrophils to their definitive host cell, the macrophage, a process that involved parasite release from infected neutrophils. Lastly, depletion of neutrophils prior to infected sand fly bite abrogated the ability of *L. major* to initiate productive infections and was associated with an increase in the production of the proinflammatory molecules, IL-1 alpha and IL-1 beta. These findings reveal the directed migration of large numbers of neutrophils to sites of *L. major* deposition by sand fly bite, identify neutrophils as critical to the infectious process and an essential cell in the parasite life cycle, and suggest *L. major* exploits

the early host response to sand fly bite in order to establish and promote disease.

1242

DENDRITIC CELL IL-23 PRODUCTION IN RESPONSE TO SCHISTOSOME EGGS INDUCES TH17 CELLS IN A MOUSE STRAIN PRONE TO SEVERE IMMUNOPATHOLOGY

Mara G. Shainheit, Patrick M. Smith, Lindsey E. Bazzone, Laura I. Rutitzky and Miguel J. Stadecker

Department of Pathology, Tufts University School of Medicine, Boston, MA, United States

Infection with schistosomes results in a CD4 T cell-mediated inflammatory reaction against parasite eggs that varies greatly in magnitude both in humans as well as in mice. In the murine disease, the severe form of immunopathology correlates with high levels of interleukin 17 (IL-17). We now report that live schistosome eggs stimulate dendritic cells from (high pathology) CBA mice to produce IL-6, TGF- β and IL-23, whereas those from (low pathology) BL/6 mice only make TGF- β . Moreover, egg stimulation of dendritic cells plus naïve CD4 T cells from CBA mice resulted in increased levels of IL-17 and the chemokines CXCL1, CXCL2 and CCL2, whereas similarly treated BL/6 cell co-cultures instead expressed higher IL-4, IL-10 and Foxp3. Neutralization of IL-23, but not of IL-6 or IL-21, profoundly inhibited egg-induced IL-17 production in the CBA co-cultures, and only the addition of exogenous IL-23 stimulated BL/6 cells to make IL-17. These findings identify IL-23 as a critical host factor that drives IL-17-production and suggest that a genetically programmed innate pro-inflammatory response against the parasite determines the development of Th17 cells and the outcome of immunopathology in schistosomiasis.

1243

PERIPHERAL TREG INDUCTION CAN BE DIRECTLY MEDIATED BY HELMINTH-DERIVED PRODUCTS

John R. Grainger, Henry J. McSorley, Yvonne M. Harcus, Edward J. Greenwood, Rick M. Maizels

Institute of Immunology and Infection Research, University of Edinburgh, United Kingdom

Epidemiological studies of human allergic disease have highlighted the discordance between their increasing prevalence in the western world, compared to lower incidence in the developing world, where endemicity of helminth parasites is high. In animal models, a direct link has been suggested between helminth infection and reduced allergic responses. For example, mice harbouring the chronic rodent gut nematode *H. polygyrus* show suppressed allergic airway inflammation, even if infection follows normal sensitization of the immune system. Moreover, transfer of CD4⁺CD25⁺ Tregs, which expand in the mesenteric lymph nodes following infection, to uninfected sensitized animals results in reduced bronchial inflammation upon allergen challenge. These results suggest that parasites have evolved mechanisms to exploit host regulatory networks thus gaining a long-term survival advantage. An intriguing question is whether *H. polygyrus* activates pre-existing "natural" Tregs, or induces regulatory activity in peripheral naïve T cells. We have addressed this by functionally analysing a set of proteins released by live parasites, termed excretory/secretory products (ES). We found that *H. polygyrus* ES (HES) is able to mediate Treg induction, in vitro, as anti-CD3 stimulation of Foxp3 negative splenocyte cultures in the presence of HES leads to de novo Foxp3 expression. Foxp3 induction is not observed with anti-CD3 stimulation alone or with a range of other pathogen-derived products tested under the same conditions. Furthermore, Foxp3 induction is dependent upon signalling through the TGF- β receptor as inhibition of this pathway with a specific inhibitor (SB431542) abrogates Foxp3 induction by HES. The Tregs induced by HES are able to suppress proliferation of effector T cells to a similar extent as TGF- β generated Tregs. These data confirm that helminth derived products are able to

directly drive Treg expansion in the periphery, raising the possibility that they can mediate the airway allergy suppression observed in whole worm infection.

Author Index

A

- A, Sijuade O. **949**
A, Sowunmi 949
Ab Barnabas, Gebre 173
Abad-Franch, Fernando **51**
Abaga, Simon 738
Abastorflor, Maria del Carmen 1201
Abate, Luc 1079
Abban, Ekua 691, 1170
Abboud, Philippe 402
Abd-dalla, Mohamed 280
Abdoulaye, Traoré 856
Abdulla, Maha 1205
Abdulla, Salim **27**, 172, 175, 568, 569, 614, 956, 982
Abdullah, Ariffin 1179
Abdulrahman, Abdi 991
Abenyega, Tsiri 584
Abeyewickreme, Wimaladharm 842
Abila, Patrick 53
Abiodun, Oyindamola O. **974**
Abokyi, Livesy 473
Abot, Esteban 1037
Abot, Stephen 1034
Abraham, David **1152**, 1153
Abbruquah, Harry H. **638**
Abu Ayyash, Luma 1097
Abudho, Bernard 333
Acero, Víctor M. 546
Achan, Jane 177,824
Achee, Nicole L. 242, **260**
Achidi, Eric A. 204
Achilla, Rachel 799
Acholonu, Alex D. W. 283
Acosta, Luz 331, 389
Adam, Ishag 346
Adama, Gansané 856
Adams, John H. 411, 628, 639, 776, 931
Adams, Rick 1105
Adazu, Kubaje 369, **372**, 615
Adegbola, Richard 264
Adelman, Zach N. 321, 1162, 1163
Adeloye, Olufunke C. 453
Ademowo, George O. 398, 929, **948**
Adeneye, Adeniyi K. 455
Adeothy, Adicat 1191
Adeyemo, Adebolajo 153, **154**
Adhanom Ghebreyesus, Tedros 216
Adhikari, Prabha 280
Adiguma, Thomas 1158
Adigun, Lola E. **524**
Adjei, George 28, 473
Adjei, Ohene 383
Adjemian, Jennifer **268**
- Adjuik, Martin 462, 876
Adler, A. J. 258
Adoke, Yeka 177, **1125**
Adrian, Luty 856
Aebi, T. 27
Aebig, Joan 4, 22
Afonso, Sonia 438
Afrane, Yaw 603, 1002
Afroze, Sayma 319
Agbenyega, T. 28
Agbenyega, Tsiri 881, 1190
Agboatwalla, Mubina 20
Agbor, Jean-Pierre 1169
Agdebola, Richard 883
Ager, Arba L. 973
Agnamey, Patrice 470, 471
Agomo, Chimere C. O. 455
Agtini, Magdrina 105
Aguayo, Nicolas 1099
Agudo, Roberto 1099, 1101
Aguiar, Joao 1034
Aguilar, H. Marcelo 51
Aguilar, Patricia 1100, 1128
Aguirre-Andreasen, Aura 1225
Agwanda, Bernard 265
Agyemang, Alex 568
Ahmad, Fasihuddin B. 946
Ahmadi, Abdul Ali 54
Ahmed, Be-Nazir 1222
Ahmed, Rukshana 1013
Ahmed, Shadab 108, 503
Ahn, Heui-June 968
Ahoranayezu, Jean B. 791
Ahouidi, Ambroise D. **1212**
Ahounou, Daniel 567
Ahrer, Margareta 966
Ahumada, Adriana 1, 176
Ainslie, Robert 99
Ajaiyeoba, Edith O. 239, 974
Ajayi, Ikeoluwapo O. **174**
Akala, Hoseah **983**
Akashi, Hiroomi 412
Akhwale, Willis 212
Akida, Juma A. 195, 1012
Akingbola, Titi S. 398
Akinsola, Adebayo 883
Akogbéto, Martin 567, 765
Akogun, Oladele 524
Akor, Francis 726
Aksoy, Serap 53
Al-Ali, Faiza 1226
Al-Enezy, Nadia A. 1226
Al-Kubati, Abdul Samid 131
Al-Mekhlafi, Hesham M. 276, 1179
Al-Rifaai, Deena 1226
Al-Shazly, Atef M. 361
Al-Shelahi, Fathma A. 1226
Alaba, Olufunke A. **853**
Alabaster, Amy **658**
Alaeddine, Ferial 1144
Alaganan, Aditi 30
- Alameda, Laura 590
Alarcon, Maritza 533
Alarcón, Maritza E. 165, **166**
Alarcon-Chaidez, Francisco 258, 1172
Alaro, James R. **1042**
Alava, Aracely 127
Alba, Sandra **396**, 573
Albújar, Christian 312
Alcena, Danielle C. 490
Alder, Stephen 881
Aldstadt, Jared 49
Aldunate, R. 1103
Alefantis, Timothy 2
Alegre Palomino, Yuri 766
Alexander, Jamela S. **283**
Alexander, Mathew 396
Alexander, Neal 687, 1220
Alfred, Tiono B. 856, **877**, **1035**
Algarin, Elias 555
Ali, Mohamed A. R. **361**
Alifrangis, Michael 226, 328, **345**
Aliota, Matthew T. 428, **663**
Alisjahbana, Bacht 13, 896, 897, 1109
Alker, Alisa P. 1119
Allan, Sandra A. **1087**
Allen, Denise R. 175
Almeida, Fernanda B. 436
Almeida, Paulo 227, 229
Almeida, Roque P. **1203**
Almeida, Walquiria 951
Almela, María 971
Almeras, Lionel 972
Alonso, Carlos 777
Aloy, Valeriano 738
Alphey, Luke **1068**
Alphonse, Ouédraogo 856, 877, **1035**
Alrefaei, Yousef N. **301**
Alreja, Gaurav 80
Alum, Absar 284
Alva, Issac 1129
Alvarez, Angela 586, 587
Alvarez, Danilo 808
Alvarez, Kanwal 1199
Aly, Ahmed S. I. **410**
Amador, Manuel 57, 123, 502
Amadou, Konaté T. 856, 877, 1035
Amadou Alpha, Sall 832, 912
Amalvict, Rémy 972
Amaral, Veronica 561, 920
Amathe, Ouédraogo 877, 1035
Ambrose, Pauline A. 430, 431
Amendome, Hyacinthe 1191
Ameh, David 793
Amemiya, Isabel 367
Amenga-Etego, Lucas 876
Amenga-Etego, Stephen 462
Amenya, Dolphin 1002
Amerasinghe, Priyanie H. 226
- Amidou, Diarra 856, 877, **1017**, 1035
Amoah, Linda 230
Amos, Emily 743
Ampofo, William 1166
Ampuero, Julia 1203
An, Xiuli 812
Anantapreecha, Surapee 110
Ananth, Candea 1000
Anchante-Herrera, Henry **879**
Andersen, John 811
Anderson, Joel D. 1147
Anderson, Jeniffer M. 866
Anderson, Kathryn B. **891**
Anderson, Roy M. 1148, 1149
Anderson, Sheri L. **692**
Anderson, Tim **200**, 1123
Anderson, Troy D. 1216
Anderson, Timothy J. C. 1147
Andersson, Neil 733
André Lin, Ouedraogo 856
Andreadis, Theodore 697
Andrews, Katherine T. 970
Andrianarivo, Aurélie G. 50
Andriano, Kim 569, 570
Ang, Agnes 439
Angel, Ross 811
Angov, Evelina 2, 5, 326, **643**, 647
Angulo-Barturen, Iñigo 586, 587, 706
Angutoko, Patrick 395
Ankrah, Cecilia A. K. 172
Ann, Moormann M. 215
Anne, Dupressoir 832, 912
Anné, Jozef 409, 994
Anova, Lalaine 978, 979
Ansah, Evelyn K. **91**
Ansah, Patrick 876
Ansari, Aftab A. 46
Ansong, D. 28
Ansong, Daniel 881
Anstey, Nicholas 796, 935, 1183, 1194
Anthony, Holder A. 624
Anto, Francis 876
Antonio-Nkondjio, Christophe 683, 1169
Antonjaya, Ungke 708, 716, 896
Anumudu, Chiaka I. 624
Anyona, Samuel **640**, 1022, 1230
Anyorigya, Thomas 876
Apangu, Titus 419
Aparicio, Hugo 1201
Apiwathnasorn, Chamnarn 1220
Apollo, Duncan 458
Appawu, Maxwell A. 235
Apperson, Charles S. **780**, **1097**
Aradaib, Imad 404
Arana, Byron A. 869
Araujo, Sonia 165, 166, 533
Araújo, Sérgio F. 421, 872

- Araujo-Castillo, Roger V. 709
 Araz, Engin 435
 Arbiza, Juan 118
 Arcà, Bruno 737
 Arduin, Pascal 883
 Areekul, Pannatad 637
 Areerob, Jeeranun 702
 Arévalo, Jorge 1202
 Arevalo, Maria T. 11
 Arez, Ana Paula 633
 Arguello, D. Fermin 898
 Arguin, Paul 212
 Argumedo, Santos 888
 Arheart, Kristopher L. 684
 Arieu, Frederic 599, 611
 Arinaitwe, Emmanuel 729, 944, 1050
 Aristide, Ako A. 595
 Arlian, Larry 854
 Armien, Anibal 1107
 Armien, Blas 113, 491, 1107
 Armour, Doug 222
 Armstrong, Tanya 401, 1204
 Armstrong Schellenberg, Joanna 998
 Arnold, Ute 424
 Aroian, Raffi V. 1177, 1178
 Aronson, Naomi E. 544
 Arostegui, Jorge 733
 Arriaga, Bustos 888
 Arriagada, J. J. 1103, 1127
 Arrigo, Nicole C. 318
 Arrospide, Nancy 1026
 Arrowood, Michael 287, 1140
 Arthayapan, Thongdang 801
 Arvelo, Wences 98, 463
 Arvindakshan, Rajeev 280
 Asafo Adjei, E. 28
 Asante, Kwaku P. 28, 462, 473
 Ashcraft, Deborah S. 274
 Asher, Constance 978, 979, 980
 Ashiegbu, Kelechi K. K. 67
 Ashimogo, G. 438
 Ashley, Elisabeth A. 966
 Asih, Puji B. 196, 376, 1185
 Asiimwe, Carol 395
 Asinobi, Adanze 624
 Asnis, Deborah 707
 Asoala, Victor 876
 Aspen, Stephen 671
 Assadou, Mahamadoun H. 1005
 Assaf, Ray 1178
 Assane, Y. 438
 Astete, Helvio 1089
 Asuzu, Micheal C. 624
 Ategeka, John 395
 Athanazio, Daniel A. 425, 444, 446, 901
 Ati, Abigael 99
 Atibu, Joseph 1000
 Atkinson, John P. 1208
 Atta, Simon K. 1228
 Atuguba, Frank 876
 Aubouy, Agnes 1191
 Audi, Allen 803
 Augustinova, Andrea 156
 Aure, Wilfredo E. 231
 Avendaño-López, Adrián E. 1076
 Avery, Vicky M. 163, 536
 Avila, Mario 1107
 Avila-Ramirez, Guillermina 437
 Avilés, William 126, 388
 Awadzi, Kwablah 1228
 Awang Mohd, Tajul A. 1113
 Aweeka, Francesca 575, 730
 Awobode, Henrieta O. 624
 Awobusuyi, Jacob 584
 Awono-Ambene, Parfait H. 683
 Ay, Hakan 543
 Ayala, Diego 746, 1169
 Ayele, Berhan 1003
 Ayi, Kodjo 1209, 1214
 Ayieko, Cyrus 1019
 Ayres, Constanca F. J. 654
 Azad, Abdu 927
 Azevedo, Raimunda S. S. 721
 Azizian, Azliyat 547, 1122
- ## B
- Ba-Fall, Fatou 967
 Babacar, Faye 967
 Babady, N. Esther 955
 Babi, Nackson 419
 Babu, Subash 381
 Baby, Mounirou 1036
 Bacchi, Cyrus J. 557, 1205
 Bacellar, Olivia 355
 Bacon, David J. 194, 197, 563, 632, 1014, 1025
 Badiane, Malick 470, 471
 Badolo, Athanase 1059
 Baganizi, Edmond 870
 Bagayoko, Mamadou W. 1004
 Baggett, Henry C. 418, 800
 Bai, Ying 265, 416
 Bailey, Robin L. 1225
 Baird, J. Kevin 196, 376
 Baja, Abdallah 982
 Baker, Joanne 959
 Baker, Margaret C. 464, 528
 Baker, Robert O. 479
 Bakken, Russell 720
 Bakshi, Rahul 762
 Balachandra, Kruavon 958
 Balderrama, M. 422
 Baldi, Pierre 621
 Baldini, Francesco 1069
 Bales, Ashlee 161
 Baliraine, Frederick N. 1002
 Ballesteros-Rodea, Gilberto 562
 Ballou, Ripley 25, 26, 27, 28, 646, 647, 1036
 Balmaseda, Angel 14, 47, 126, 388, 705, 733
 Balmer, Oliver 352
 Balogun, Sulayman T. 574, 597
 Balolong Jr., Ernesto 329, 1181
 Balsitis, Scott 45, 127
 Balu, Bharath 776, 931
 Banania, JoGlenna 1034, 1037
 Bandea, Rebecca 279
 Bandi, Claudio 522
 Bandyopadhyay, Kakali 279, 541
 Banerjee, Camellia 602
 Bangirana, Paul 85
 Banic, Dalma M. 999
 Baniecki, Mary L. 977
 Banura, Patrick 73
 Baraka, Omer Z. Mohamad Baraka 1095
 Baraka, Vito 195
 Barbara, K. A. 708
 Barbosa, Taciana F. S. 723
 Barends, Marion 200, 1123
 Baret, Eric 972
 Barger, Breanna 727
 Barillas-Mury, Carolina 691, 1070, 1170
 Barker, Christopher M. 256, 1092
 Barker, Robert H. 190, 578, 579
 Barletta, Francesca 103, 366, 367, 825
 Barnafo, Emma K. 645
 Barnard, Donald 251
 Barnes, Karen 94, 950
 Barnes, Kayla 772
 Barnett, Elizabeth D. 868
 Barnwell, John 408
 Barnwell, John W. 347, 634, 639, 999
 Barongo, Vivian K. 525
 Barrantes, Melvin 1101
 Barrera, Roberto 57, 123, 502
 Barrett, Lynn K. 977
 Barrett, Rebecca 472
 Barria, Iván 713
 Barron, Cedillo 887, 888
 Bartholomay, Lyric C. 501, 809
 Barungi-Nabukeera, Nicolette 1189
 Basáñez, Maria-Gloria 134, 207, 250, 329, 334, 1148, 1149, 1155
 Basco, Leonardo K. 198
 Bashraheil, Mahfudh 571
 Basilico, Nicoletta 976
 Baso, Samuel 376
 Bassett, Paul 1192
 Bassolé, Imael H. N. 1059
 Bastidas, Gilberto 465
 Basu, Saikat 87, 88
 Bates, P. 549
 Baudin, Elisabeth 424
 Bausch, Daniel 714, 1130
 Bautista, Analisa 389
 Bautista, Christian T. 269
 Bawa, T. 28
 Bayoh, Nabie M. 689, 690
 Beach, Michael J. 1140
 Beadell, Jon 53
 Beatty, Mark 899, 900
 Beatty, P. R. 119
 Beatty, Robert 45, 127
 Beatty, Wandy 811
 Beaty, Barry 732, 833
 Beau de Rochars, Madsen 141, 1154
 Beavogui, Abdoul H. 950
 Beck, Eric T. 507
 Becker, Sara J. 275
 Beckett, Charmagne G. 716, 896, 897, 1109
 Beckett, Geoff 477
 Beckius, Miriam L. 266
 Beckonert, Olaf 363
 Beeching, N.J. 549
 Beeler, Emily 480
 Beeson, James 326
 Begum, Yasmin A. 365
 Bei, Amy K. 1212
 Beier, John 672, 684
 Bejon, P. 26
 Bekius, Miriam L. 275
 Belenky, Alexei 523
 Bell, David 959
 Bell, Jeffrey A. 696
 Bello, Felio J. 546
 Bellofatto, Vivian 351
 Belmar, E. 1103, 1127
 Belmonte, Leonardo 871
 Beltrán, Manuela 706
 Ben Mamoun, Choukri 841, 938
 Ben-Mahmoud, Sulley K. 235
 Benavente, Luis 34, 209, 790
 Benchimol, Carla 229
 Bendezu, Herminia 552
 Bendezu, Jorge 960
 Bennett, Adam 592, 631
 Benjamin, Koudou G. 89
 Bennett, Kristine 257, 845
 Bennuru, Sasisekhar 382
 Benoit, Joshua 750
 Benton, Briana 479
 Bentzel, David E. 272
 Berganza, Elsa 777
 Bergh, Anne-Marie 827
 Bergman, Lawrence W. 1023
 Bergmann-Leitner, Elke S. 2, 5, 326, 643, 647
 Berman, J. 422
 Bermudez, Sergio 880
 Bern, Caryn 1201
 Bernabe, Antonio 1129
 Bernadino, Alice 920
 Bernal-Rubio, Dabeiba 43
 Bernhard, Sonja 542
 Bernier, Ulrich R. 1087
 Berrada, Zenda L. 781
 Bertocchi, Ione 130
 Besansky, Nora J. 679, 681, 1075, 1169, 1078
 Besirbellioglul, Bulent A. 543
 Besnard, Patrick 1219
 Bessa, Marcia 901
 Bessoff, Kovi 502
 Best, Wayne M. 1204
 Bethell, Delia 1120
 Bethony, Jeffrey M. 133, 1175

- Beverley, Stephen M. 353
 Bezerra, Rômulo J. S. **919**
 Bharti, Praveen K. **1011**
 Bhat, Sajid 381
 Bhatia, Ajay 564
 Bhatia, Beena 431
 Bhatta, Narendra **445**
 Bhatta, Nisha Keshary **447**
 Bhattacharjee, Apurba K. 583
 Bhattacharya, Payel 553
 Bhoi, Sanjeev 65, 80, 82
 Bhonsle, Jayendra 581
 Bhuiyan, Md. Saruar 415
 Bianchi, Angela 173
 Biasor, Moses 628
 Bienvenu, Sirima S. **856, 877**
 Bier, Stacia 815
 Biggerstaff, Brad 898
 Bigogo, Godfrey 803
 Bii, Christine 81
 Bilak, Hana 216
 Bilal, Alia 1160
 Bilenge, Constantin M. 542
 Billingsley, Peter 1
 Bilong Bilong, Charles 531
 Bimi, Langbon 223
 Biollaz, Jérôme 170
 Biritwum, Nana 464, 528
 Birkenmeyer, Larry **961, 962, 963**
 Birnbaum, Ron A. 353
 Birren, Bruce W. 47, 406, 1211
 Biru Shargie, Estifanos 527
 Bishop, Henry S. 287, 456, 1176
 Bishwakarma, Raju 503
 Biswas, Gautam 1112
 Biswas, Sukla 341
 Bittaye, Ousman 726
 Black, Carla L. **302, 330, 358, 362, 788**
 Black IV, William C. 667, 1061, 1063, 1067,
 Blackwell, Jenefer M. 161, 872
 Blair, Carol D. 122, 489, 830, 833
 Blair, Patrick 13, 426, 708, 716, 802, 896, 897, 1109
 Blair, Peter **222**
 Blair, Silvia 981
 Blank, W. A. **751**
 Blanton, Elizabeth 369
 Blanton, Ronald E. 294, 673, 751
 Blazes, David L. 320, 709, 719
 Blitvich, Bradley J. **501, 809**
 Block, Olivia **486**
 Bloland, Peter B. 614
 Bloomquist, Jeffrey R. 1216
 Blum, Johannes A. **534, 542**
 Blum, Lauren S. 100, 101, 102, 368, 370
 Boakye, Daniel A. 235, 253, 1228
 Bobanga, Lengu T. **243**
 Bobenchik, April M. 841, **938**
 Bockarie, Moses J. 529, 607, 1112, 1115, **1158**
 Bockstal, Viki 1240
 Bodhidatta, Ladaporn 801
 Boelaert, Marleen 1180
 Boele van Hensbroek, Michael 474
 Boggild, Andrea K. 1202
 Bohórquez, Elaine B. **539**
 Boivin, Michael J. 85, 337
 Bojang, Kalifa 1190
 Bojang, Kalifa A. **726**
 Bolarte, Jose 914
 Bolas, Stefanie **100**
 Bolatti, Elisa 923
 Bolduc, Kyle 537
 Bolio-Gonzalez, Manuel 922
 Bolla, Melissa 1124
 Bolling, Bethany G. **833**
 Bonet Gorbea, Mariano 1150
 Bongiorno, Gioia 693
 Bonizzoni, Mariangela 1002
 Bonjardim, Cláudio A. 117
 Booker, Michael L. **523, 582**
 Boonlikit, Smin 801
 Boonmar, Sumalee 416
 Boonmars, Thidarut 181
 Boonak, Kobporn **10**
 Boonpheng, Samlit 957
 Boore, Amy L. 101, **102, 370**
 Boppana, Venkata D. 258, 1172
 Borba, Susan C. P. 161
 Borchert, Jeff N. 419
 Bore, Youssouf 1004
 Borges, Marcos C. 116, 124
 Borja, Artur 227
 Borrmann, Steffen **171, 569, 764, 991**
 Borrow, Ray 264, 883
 Bose, Tanima 553
 Bosio, Christopher F. **782**
 Bosman, Andrea 173
 Bosque-Oliva, Elisa 464
 Botros, Sanaa 755
 Bottero, Julie 210
 Bottomley, Christian 1155
 Bouckenoooghe, Alain **386**
 Bougma, Roland 528
 Bougouma, Edith 1017, 1031, 1041
 Boulanger, Denis 324, 737, 1219
 Boulos, Marcos 951
 Bourgeois, Melissa **506**
 Bourguinat, Catherine 1156
 Bourne, Nigel 499, 807
 Bousema, Teun 31
 Boussinesq, Michel 130, 1156
 Boutros-Toni, Fernand 130
 Bowen, Anna 20
 Bowen, Richard 500, 511, 892
 Bowers, Lisa C. 459
 Bowling, Tana 538, 1205
 Boyd, Alexis **141**
 Boyd, Kelley 43
 Boykin, David 540
 Boyle, Katharine 2
 Boyom, Fabrice F. 187
 Brabin, Bernard J. 605, 606
 Brackney, Douglas E. **910, 1065**
 Bradley, Mark 1112, 1114
 Brady, Mark 1201
 Braghiroli, J. F. 751
 Braig, Henk R. 925
 Branch, OraLee H. 632, 653, 1045
 Branco, Luis 714
 Brando, Clara **648**
 Brasov, Ioana 555
 Brasseur, Philippe M. G. **470, 471**
 Bratt, Carol L. 160
 Brattig, Norbert W. 383, 429
 Bray, Pat 1029
 Breiman, Robert F. 100, 101, 102, 265, 368, 369, 370, 803
 Breman, Joel G. 945
 Brend, Sarah 1140
 Bresson-Hadni, Solange 402
 Bretscher, Michael T. **995**
 Brewoo, Joseph 892
 Brey, Paul 121
 Breyse, Patrick 1143
 Briand, Valérie **210**
 Bridges, Michael 19, 875
 Briggs, Benjamin J. **1110**
 Briggs, Deborah J. 718
 Brindley, Paul J. 290, 301, 739
 Briolant, Sébastien 972
 Brion, Job D. 389
 Britch, Seth C. **1058**
 Brito, Cristiana F. Alves de. 225, 1021
 Brocard, Anne-Sophie **717**
 Broce, Candida 1107
 Brooker, Simon 133, 464, 725
 Brooks, John T. 826
 Brooks, Mohamad I. 1006, 1008
 Brown, Charles 223, 253
 Brown, Emily L. 548
 Brown, Graham 935
 Brown, Ivy K. 910
 Brown, Jessica 1135
 Brown, Okoko 883
 Brown, Theodore R. **700**
 Brown, William 1098
 Brownstein, Michael 228
 Bruce, Jane 997, 998
 Bruder, Joseph T. 5, 6, 7, **644, 1034, 1037**
 Bruhn, Kevin W. 353
 Brun, Reto 539, 974, 975
 Brunetti, Enrico 400, 405, 443
 Bruno, Lapiéd 1217
 Brusentsova, Irina V. 678
 Brustoski, Kim **529**
 Bruxvoort, Katia J. **956**
 Bryant, Juliet E. **121**
 Bryant, Naomi 852
 Bualombai, Pongwit **957, 958**
 Buard, Vincent 424
 Buathong, Rome **110**
 Bubb, Martin 959
 Bucala, Richard 1231
 Buck, Gregory A. 288
 Buckingham, Donna W. 812
 Buckner, Frederick S. 977, **1206**
 Buclin, Thierry 170
 Buekens, Pierre 860
 Bukirwa, Hasifa **576, 816, 1125**
 Bulimo, Wallace 799
 Bulla, Lee 660, 1064
 Bungiro, Richard D. 814
 Bunin, Barry **180**
 Bunyi, Juancho 1096
 Burgess, Steven J. 975
 Burgess, Timothy H. 13, 426, 708, 716, 896, 897, 1109
 Burk, Chad 621
 Burke, Donald S. 48, 385
 Burke, Heather 803
 Burke, Martina 954
 Burkot, Thomas R. 1114
 Burns, Jr., James M. 1023, 1042
 Burri, Christian 542
 Busche, Jeff 670
 Büscher, Philippe 539, 1202
 Butler, Sara E. **297, 333**
 Butrapet, Siritorn 489
 Buttenschoen, Klaus 402
 Buzzar, Marcia 425, 444, 446
 Byarugaba, Justus 85
 Byass, Peter 173
 Bygbjerg, Ib C. 226, 328, 345
 Byrd, Brian D. 664, 666, 849, 1083

C

- C, Happi 949
 Cabada, Miguel 109
 Cabal, Ace Bryan S. **104, 288**
 Cabaret, Jacques 1156
 Cabello, Martin 103
 Cabezas, Cesar 485, 914
 Cabrera, Lilia 278, 282
 Cabrera-Mora, Monica 650
 Caccione, Adalgisa 53, 683, 738
 Caceda, Roxana **1100, 1128**
 Cáceres, Marcia 312
 Cadena, Horacio 687, 744
 Caffrey, Conor R. 303
 Cai, Jenny 374
 Caillouët, Kevin A. 255, **510, 849**
 Calavia Garsaball, Olga 701
 Calderon, Claudia 59
 Calderon, Maritza 1201
 Calderon-Albor, Javier 39
 Calderón-Arguedas, Olger 684, 1076
 Calderwood, Stephen B. 365, 414, 415
 Calis, Job C. J. 474
 Calisher, Charles H. 1105
 Call Ramon, Laia 701
 Callacna, Miriam 468
 Calvo, M 1127
 Calzada, Jose 768, 1028
 Cama, Rosa 282
 Cama, Vitaliano A. 278, **282**

- Cameron, Emilie **1073**
 Camino, Isabel 586
 Campagna, John D. A. **69**
 Campbell, Corey L. **667**, 1108
 Campbell, Karen M. **49**
 Campo, Joseph J. 6
 Campos, Ciro 51
 Campos, Francisco 704
 Campos, Joseph 610
 Canales, Marco 879
 Canfield, Craig J. 973
 Cantey, Paul T. **1118**
 Cantilena, Louis R. 182
 Canto-Cavalheiro, Marilene M. 561, 920
 Canyon, Deon 132
 Cao, Jun **840**
 Cao, Wu-Chun 1167
 Capeding, Maria R. Z. 386, 389
 Cappello, Michael 814, 1231
 Caputo, Beniamino 681, 693, 1168
 Carabin, Hélène 38, 40, 41, 329, 1181
 Carcamo, Alvaro 733
 Carcamo, Cesar **1129**
 Cardona, María Teresa 454
 Cardoso, Thiago M. 355
 Carey, Cristian 316
 Carey, James R. 734
 Carlier, Paul R. 1216
 Carlo, Costantini 1217
 Carlone, George 264, 883
 Carlow, Clotilde K. 515, 523
 Carlton, Jane M. 224, 939
 Carmo, Theomira M. A. 901, 902, 903
 Carneiro, Ilona 96, 441
 Carnevale, Pierre 1219
 Carpenter, L. R. 551
 Carret, Celine 773
 Carretero Bellón, Juan 701
 Carrion, Rebeca 316
 Carrion, Ricardo 807
 Carroll, C. Ronald 768
 Carroll, Dustin 978, 979, 980
 Carron, Alexandre 1221
 Carron, Jaime 132
 Carter, Chandra 1130
 Carter, Jennifer M. 788
 Carter, Nick 584
 Carter, Robyn 703
 Carter, T. 26, 27
 Carvalho, Adriana V. 919
 Carvalho, Edgar M. 161, **355**, **784**, 1203
 Carvalho, Josiane S. M. 1203
 Carvalho, Luzia H. 225, 1021
 Carvalho, Valéria L. 315, 721
 Casagrande, Manolo 976
 Casandra, Debora R. **535**
 Casares, Sofia **1018**
 Casimiro, Sonia 234, 1052
 Casseb, Lívia M. N. 723
 Casseb, Samir M. M. 315
 Cassone, Bryan J. **1075**
 Castañeda, Gutierrez 887
 Castaneda, Lisa J. 977
 Castañeda, Pablo 586
 Castellarnau Figueras, Ester 701
 Castellucci, Lea 161
 Castillo, C 1103, 1127
 Castillo, Carmen Elena 1220
 Castillo, Leticia 113, 491, 777
 Castillo, Maria Esther 704, 798, 825
 Castillo, Roger M. 487
 Castro, Bronislawa 425, 444, 446
 Castro, Glenda 127
 Castro, Ibraim C. 107
 Castro, Luiza A. 116, 124
 Castro, Martha I. 698
 Castro-Llanos, Fanny 850, **1088**
 Catalan, Ana G. **1062**
 Catarino, Manuela B. 629
 Catteruccia, Flaminia **1069**
 Cavalli, Anna **1180**
 Caviedes, Luz 798
 Ceccato, Pietro 1003
 Celatka, Cassandra 190, 579, 582
 Celermajer, David 1183, 1194
 Cen, Ye-Ying 280
 Ceravolo, Isabela **1021**
 Cesa, Kristina 843
 Céspedes, Manuel 1099
 Cevallos, William 119, 413
 Chadee, Dave D. 1072, 1074
 Chaîne, Jean-Paul 132
 Chakravarty, Sumana 1
 Chalwe, Victor 823, 829
 Chambers, Eric W. **1114**
 Chambonneau, Laurent 386
 Chan, Adeline 555
 Chance, M.L. 549
 Chandra, Richa **374**
 Chandramohan, Daniel 96, 441, 462, 820
 Chandrawansa, P.H. 550
 Chandre, Fabrice 765
 Chansawang, Malee 1119
 Chao, Day-Yu 496
 Chapilliquen, Fernando 1088
 Chapolla, Erica 425, 444, 446
 Chaponda, Enesia B. **986**, **988**
 Chareonsirisuthigul, Takol 483
 Charlebois, Edwin 824
 Charles, Richelle C. **414**
 Charman, Susan 1204
 Charoenvit, Yupin 1018
 Charret, Karen S. 561, **920**
 Charvet, Claude 1156
 Chase, Michael 414
 Chattopadhyay, Chandon 592
 Chattopadhyay, Rana 1
 Chauca, Gloria 709
 Chauhan, Chitra 776
 Chauhan, Kamal 242
 Chaumont, Julie 264, **883**
 Chaussabel, Damien 379
 Chavchich, Marina 467, 600
 Chaves, Luis F. **29**
 Chavez-Nuñez, Leysi 844
 Che, Julius 384
 Checkley, Anna **954**
 Checkley Needham, Lisa **990**
 Cheeseman, Ian H. **773**
 Chen, Chang-Shi 1177
 Chen, Daitao 537
 Chen, Huiyuan 44
 Chen, Hua-Wei **273**
 Chen, Honggen 357
 Chen, John 928
 Chen, Junhu 942, 968
 Chen, Li 1178
 Chen, Nanhua 600, 1121
 Chen, Ping 5, 6
 Chen, Wei-June **913**
 Chen, Yufeng 970
 Chenet, Stella M. **632**, 1014
 Cheng, Changde 679
 Cheng, Qin **600**, 616, 959, 1121, 1122
 Cheruiyot, Agnes 983
 Chiang, Jannifer O. 721
 Chiappe, Marina 1129
 Childers, Thomas 489
 Chilengi, Roma 23, 856, 1012
 Chiller, Tom 826
 Chim, Phektra 599
 Ching, Wei-Mei 273
 Chinh, Nguyen T. 449
 Chinnawirotpisan, Piyawan 125
 Chiodini, Peter L. 954
 Chippaux, Jean-Philippe F. **871**
 Chishimba, Sandra **305**, 393
 Chitari, Sanika 771
 Chitnis, Nakul **792**
 Chittaganpitch, Malinee 800
 Cho, Pyo Yun 291, 292
 Cho, Yoonsang 1231
 Choi, Dongseok 278
 Choi, Yong-Soon 942
 Cholpol, Sawat 1119
 Chootong, Patchanee **628**
 Chor, Tong 1160
 Chotivanich, Kesinee 633
 Chow, Lin H. 1040
 Chowdhury, Fahima 365, 415
 Choy, Henry A. 68
 Chretien, Jean-Paul 710
 Christensen, Bruce M. 428, 519, 521, 663
 Christofferson, Rebecca C. **1090**
 Christophides, George 1078
 Chua, Rowena 565
 Chuang, Ilin 7, 1034
 Chuang, Shu-Fang 492, 496
 Chuenchitra, Thippawan 801
 Chukwuocha, Uchechukwu M. C. **67**, **451**
 Chunsuttiwat, Supamit 891
 Chuo, Ching-Yi J. **492**
 Churcher, Thomas S. 334
 Cienfuegos, Astrid V. **686**, 1077
 Cimafranca, Rennan 115
 Cisse, Badara 324, 737
 Cisse, Moustapha 470, 471
 Cissé, Ousmane 1004, 1027, 1182
 Clague, Birgit 800
 Clardy, Jon 582, 588, 977
 Clark, Jeffrey W. **56**
 Clark, Tamara D. 84, 730, 818
 Clarke, Sian E. 725, **820**
 Clayton, Joshua W. 1040
 Cleary, Thomas G. 366, 367
 Clem, Rollie **1133**, 1134
 Clennon, Julie A. 252, 305
 Clode, Peta 401
 Close, David 472
 Coberly, Jacqueline S. **710**, **867**
 Coetzee, Maureen 373, 1215
 Coffey, Ruthie **962**, 963
 Cogswell, Ann C. **1105**
 Cohen, J. 25, 26, 27, 28, 646, 647, 1036
 Cohen, Justin M. **205**
 Cohen, Sara B. **478**
 Cohuet, Anna 746, 1079
 Coldren, Rodney L. 700
 Cole-Tobian, Jennifer 639
 Coleman, Michael **234**, **373**, **475**, **771**
 Coleman, Marlize **373**, **771**
 Colette, Colette 1204
 Colin-Flores, Rafael 922
 Colley, Daniel G. 302, 330, 358, 362, 788
 Collins, Frank H. 664, 1078
 Collins, Matthew H. **1196**
 Collins, Richard C. 1155
 Coloma, Josefina 119, 127, 388, 733
 Colón, Candimar 502
 Coluzzi, Mario 681
 Comach, Guillermo 1101
 Comte, Eric 966
 Congpuong, Kanungnit 957, 958
 Conn, Jan E. 686, 698, 1077
 Connors, Katherine J. **119**
 Conrad, Conrad W. 1209
 Conroy, Andrea 1184, 1187
 Contreras, Carlos 312
 Contreras, Carmen A. **366**
 Conway, David 726, 735, 773, 793, 930, 933, 1016, 1168, 1229
 Conway, Leslie 516
 Cook, Earnest 458
 Cook, Jackie 795, **997**
 Cooke, Brian M. **812**
 Cooper, Roland 760
 Cooperband, Miriam F. 1087
 Coosemans, Marc 567, 1051
 Coppens, Isabelle 838
 Corbel, Vincent 232, **233**, 1221
 Corbett, Yolanda 976
 Cordero, Garcia 887, 888
 Cordon-Rosales, Celia 808
 Cornejo del Carpio, Juan G. 767

- Cornel, Anthony J. 50, 241
 Cornélie, Sylvie 737, 1093, 1219
 Corradine, Giampietro 1017
 Corrales, Rosa M. **926**
 Corran, Patrick 795, 997, 1016
 Correa, Margarita M. 686, **698**, **1077**
 Correa, Ricardo 1107
 Correa-Oliveira, Rodrigo 133, 1175
 Cortese, Joseph 190, 578, 579, 582, 977
 Cortez, José 134
 Cortez, Ricardo 255
 Cosgrove, Shaun 1140
 Coskun, Omer 543
 Costa, Elenild 423
 Costa, João 227
 Costa, Peter J. 718
 Costantini, Carlo 681, 746, **1169**
 Costanzo, Gianfranco 173
 Cot, Michel 210, 1191
 Coudeville, Laurent **391**
 Coulibaly, Cheick A. 866
 Coulibaly, Drissa 25, 1036
 Coulibaly, Mamadou 249, 679
 Coulibaly, Michel E. 128, 129, 787, 789, 1232
 Coulibaly, Sheick O. 605, 606, 619, 821
 Coulibaly, Siaka Y. 128, 129, 787, 789, 1232
 Coulibaly, Yaya I. 128, 129, 787, 789, 1232
 Coulter, Christopher 703
 Courtney, David 222
 Coutinho, António 227, 229
 Coutinho, Bruna P. 107
 Cowan, Linda D. 40, 41
 Cox, Jon 997
 Cox-Singh, Janet 946
 Crabb, Brendan S. 624
 Craft, Noah 353
 Craig, Philip S. 399, 403
 Cravioto, Alejandro 365
 Cretu, Carmen-Michaela 400
 Criscione, Charles D. **1147**
 Crockett, Maryanne 322
 Croda, Julio **68**
 Crompton, Peter D. 220, 325, **620**, **621**, 622, 623
 Cromwell, Mandy 190, 578
 Crookston, Benjamin 881
 Crosby, Seth D. 432
 Cross, Paul C. 1132
 Crowley, Michael 1045
 Crowther, Gregory J. **977**
 Crump, John A. 369
 Cruz, Ana C. R. 315
 Cruz, Cristhopher 1128
 Cruz, Estrella I. **1096**
 Cruz, Karin 1088
 Cruz, Rollin A. 709
 Cruz-Chan, Vladimir 922
 Cruz-Rivera, Mayra 437
 Cserti-Gazdewich, Christine M. 1189, 1214
 Cuamba, Nelson 1052
 Cubillas, Luis 1088
 Cuinhane, C. 438
 Cuiza, A 1127
 Cummings, Derek A. T. **48**, **385**
 Cummings, James 646, 1036
 Cundill, Bonnie 133, 725
 Currie, Bart J. 52
 Curto, Ernesto 766
 Cysticercosis Working Group in Papua 439
- ## D
- D'Acremont, Valérie 394, **397**, **577**
 D'Alessandro, Umberto 177, 323, 409, 567, 576, 605, 606, 619, 821, 823, 829, 994, 1051
 d'Avila-Levy, Claudia M. 846
 Da, Alida 40
 Da, Ollo U. 306
 da Silva, Ana Cristina A. **1176**
 da Silva, Alexandre J. 279, 287, 456, 541, 826, 1176
 da Silva, Eliana V. P. 315, 721
 da Silva-Nunes, Mônica 211
 Dabire, Roch K. 1060, 1082, 1084
 Dacso, Mara **61**
 Dadlani, Harsha 935
 Daehnel, Katrin 380
 Dagoro, Henry 1158
 Dahal, Rajan Kumar 66
 Dahal, Shaligram 503
 Daher, André 951
 Dahlbäck, Madeleine 641
 Dai, Bui 449, 467
 Daily, Johanna Patricia 349, 1211
 Dal-Bianco, Matthias 199
 Dala, Amadeu 542
 Dalgaard, Michael B. 345
 Daly, Thomas M. 1023
 Damman, Christopher J. 977
 Danboyi, J. 1117
 Daniell, Cindy 279
 Daniels, Rachel 772
 Danjuma Goshit, D 1157
 Dao, Adama 249
 Dao, Hoang N. 12, 893
 Daou, Modibo 25, 1036
 Dara, Antoine 727
 Dargelas, Valerie 1142
 Darriet, Frédéric 232, 1221
 Das, Debanjana 553
 Das, Satadal **87**, 88, 553
 Das, Suchismita **1137**
 Dasch, Gregory A. 417, 480, 777
 Dash, Aditya P. 224, 341, 602, 984, **992**, 1006, 1008, 1011
 DaSilva, Alexandre 1143
 Dat, Tran V. 12
 Davenport, Gregory 339, 371, 640, 936, 937, 1022, 1230
 David, Jean-Philippe 232
 Davidyants, Vladimir 206
 Davies, Stephen J. 303, 757
 Davis, Timothy M. E. 946, 1195
 Davis, Xiaohong 461
 Dawes, Emma J. **207**, **250**
 Dawson, George 961, 962, 963
 Day, Nicholas P.J. 633
 Ddungu, Henry 1189
 De, Dibyendu 580
 de Almeida, Marcos 541
 de Groot, Philip G. 1185
 de Jesus, Amelia R. **161**
 de la Rua, Nicolas **843**
 de Mast, Quirijn **1185**
 de Oliveira, Ana L. **1045**
 de Rivera, Ivette 1101
 De Sousa Dias, Marcia C. 872
 de Souza, Dziejdom K. **253**
 de Vlas, Sake J. **360**, 1159, **1167**
 De-Simone, Salvatore G. 999
 Deardorf, Eleanor 9
 Dearen, Theresa 1140
 Debache, Karim 1144
 DeBaene, Kelly 1098
 Deborggraeve, Stijn 1202
 Debrah, Alexander Y. 383
 Debreyei, Yeboah M. 383
 DeRoy, Sruti **158**, 916
 Decosterd, Laurent A. 170
 Dedmon, Robert E. **718**
 DeJong, Randall 1170
 Dejsirilert, Surang 418
 Delgado, Christopher **596**
 Delgado, Franklin 1099
 Delgado, I. 1127
 Della Torre, Alessandra 681, **693**, 1069, **1168**
 Dellicour, Stephanie **609**
 Delorey, Mark J. 512
 Deloron, Philippe 77, 1191
 DeVecchio, Vito 2
 Demas, Alisson 349
 Demebele, Benoit 128, **129**, 787, **789**, 1232
 Dembélé, Massitan 528
 Demetere, Edith 1093
 Deming, Michael 335
 Demoitie, M.A. 26, 27, 28
 Denery, Judith R. 740
 Deng, Haiyan 580, 761
 Dengue Group, CIETNicaragua 733
 Denlinger, David L. 655, 750, 1138
 Denslow, Nancy 506
 Dent, Arlene 326, 625, 651, 1020
 Deo, Gratias K. 542
 DePasse, Jay 520
 DeRisi, Joseph L. 336
 Deriso, Elizabeth **2**
 Desai, Anita 834, 905
 Desai, Meghna 72
 Desai, Suresh 961, 962, 963
 Desai, Sanjay A. 221
 Desprès, Philippe 805
 Desta, Alem 173
 Deus, Kelsey M. **770**
 Deus, Lígia 229
 Devine, Gregor J. **766**
 Devore, Casey **1134**
 Dewa, Priscillia 874
 Deye, Gregory **458**
 Deyrup, Leif 477
 Dhabangi, Aggrey 1189
 Dhakal, Subodh. S. 445
 Dhepaksorn, Panadda 958
 Dhir, Soumendra 1118
 Di Deco, Maria Angela 681
 Dia-Eldin, Elnaïem A. 866
 Diabate, Abdoulaye 1082
 Diakité, Mahamadou 985
 Diakite, Seidina A. S. 220, 787
 Diallo, Aldjouma 883
 Diallo, Abdallah A. 24, 25, 128, 129, 787, 789, 1005, 1036, 1232
 Diallo, Ibrahim 967
 Diallo, Mawlouth 1106, 1165
 Diallo, Souleymane 797
 Diamond, Michael S. 804
 Diarra, Amidou 1031, 1041
 Diarra, Issa 25, 1036
 Diarra, Souleymane S. 866
 Dias, Gutemberg H. 872
 Dias, Sajani 1032
 Diassiti, Angelina 322
 Diaz, Annette 57
 Diaz, Francisco J. 497, 899
 Diaz, Luis 468
 Diaz, R. 1127
 Diaz Lujan, Cintia M. 923
 Díaz Toro, Yira R. 545
 Dickerson, Tobin J. **740**
 Dicko, Alassane 24, 584, 1005
 Dicko, Idrissa 1082
 Dickson, Anne M. **350**
 Dida, Gabriel O. 699, 1056
 Didier, Elizabeth S. **459**
 Didier, Yapi J. 595
 Diemert, David J. **1175**
 Diene, Cheikh O. 1165
 Dieppa, Migda M. 488
 Dietz, Klaus 1190
 Diggs, Carter 5, 7, 25, 646, 647, 965, 969, 1034, 1036
 Dille, Bruce 962, 963
 Dillip, Angel 396, **573**
 DiMiceli, Lauren 279
 Dimopoulos, George 428, 1071, 1137
 Ding, Dazhong 162
 Dinglasan, Rhoel R. **30**
 Dinkel, Anke 404
 Dion, Kirstin B. 683
 Diouf, Ababacar 5, 652, 1015
 DiSanto, Michael E. 565
 Disinor, Olbeg 592

- Dissanayake, Gunawardena 816
 Dituvanga, Ndinga D. 542
 Diuk-Wasser, Maria 697
 Dixit, Rajnikant **1070**
 Djerea, Khali D. 595
 Djibo, Ali 1223
 Djibril, Djibril 296
 Djimde, Abdoulaye A. 569, 727, 950, 987
 Djogbénou, Luc **765**, 1218.
 do Rosario, Virgilio E. 633
 do Valle, Suiane 951
 Dobler, Gerhard 310, **494**
 Doemling, Alexander **755**
 Dogcio, Diane 76, 86, 92, 448
 Doha, Said A. Doha. 442
 Dohm, David 695
 Dolecek, Christiane 633
 Dolo, Amagana 24, 25, 1036
 Dolo, Housseini 128, 129, 787, 789, 1232
 Domingo, Cristina 118
 Dominguez-Galera, Marco 1066
 Dominici, Francesca 112
 Don, Robert 162, 537, 538, 1204, 1205
 Donoso, S. 1103, 1127
 Doolan, Denise L. 5, 6, 7, 621, 644, 1034, 1037
 Doranz, Benjamin J. 495
 Doritchamou, Justin 1191
 Dorman, Karin S. 809
 Dorn, Patricia L. **59**, 60, 566, 843
 Dorny, Pierre 41
 Dorsey, Grant 84, 395, 575, 591, 598, 729, 730, 816, 818, 822, 944, 1050, 1125
 dos Reis, Camilla M. 919
 dos Santos, Helena **279**
 Dosoo, D. 28
 Dosoo, David 462, 473
 Douce, Richard 1101
 Doucoure, Souleymane 1093
 Doumbia, Seydou 220, 866
 Doumbia, Salif S. 128, 129, 787, 789
 Doumbo, Ogobara K. 24, 25, 94, 220, 325, 620, 621, 622, 727, 950, 987, 1005, 1036
 Doumbo, Safiatou 220, 325, 620, 621, 622
 Doumtabe, Didier 220, 325, 620, 622
 Dow, Geoffrey 189, 970, 979
 Downie, Megan J. **841**
 Downing, Marian 717
 Dozie, Ikechukwu N. S. 67, **451**
 Drakeley, Chris 26, 31, 32, 601, **795**, 993, 997
 Drame, Papa M. **1219**
 Draper, Michael P. 431
 Drolet, Barbara S. 845
 Druilhe, Pierre 23, 1012
 Duarte, Paula V. 421
 Duarte-Madrigal, Adriana 1076
 Dubhashi, Nagesh 374
 Dubischar-Kastner, Katrin **836**, **908**
 Dubois, Marie-Claude 25, 26, 27, 646, 647, 1036
 Dueger, Erica 777
 Duffull, Stephen 1183, 1194
 Duffy, Michael 935
 Duffy, Patrick E. 743, 1124
 Duggan, Hannah 1130
 Dujardin, Jean-Claude 1202
 Dumonteil, Eric 59, **566**, **844**, **860**, **922**
 Duncan, Elizabeth H. 643
 Dunlap, Brett G. 478, 551
 Dunn, John R. 478, 551
 Dunne, David W. 300, 359
 Dunne, Michael 374
 Duparc, Stephan 584, 764
 Duraisingh, Manoj T. 1212
 Durand, Patrick 206
 Durbin, Anna P. 22, 642
 Durieux, Laurent 685
 Durrheim, David 373
 Durvasula, Ravi 1146
 Dutra, Juliana M. F. 55
 Dutta, Sheetij 25, 646, 839, 1036, **1040**
 Dvorak, Jan 303
 Dwyer, Dennis 157
 Dzik, Walter H. (Sunny) 1189
 Dzinjalamala, Fraction K. 728, **989**
- E**
- Eamsila, Chirapa 801
 Easterbrook, Judith D. 313
 Ebel, Gregory D. 504, 910
 Eberhard, Mark 456, 826
 Ebonyi, Augustine 930, 1016
 Echevarria, Áurea 561, 919
 Echeverri, Fernando 981
 Ecker, Lucie **367**
 Eckert, Erin 217, 1009, **1054**
 Edgil, Dianna 899
 Edillo, Frances **115**
 Edith, Bougouma 856, 877, 1035
 Edstein, Michael D. **449**, 450, **467**, 973
 Edu, Arcadio 738
 Edwards, Morven S. 375
 Edwards, Tansy 1225
 Egbe, John 193
 Egyir, Beverly **223**
 Eigege, Abel 335, 874, 1117, 1157
 Eisele, Thomas P. 592, 631, **794**
 Eisen, Lars **732**, 771, 833, 1066
 Eisenberg, Joseph 119, 364, 413, 1164
 Ejigsemahu, Yeshewamebrat 35, 1003
 Eko, Francis O. 917
 El Awad, Raya A. E. **1095**
 El Bissati, Kamal 841
 El Karib, Samia A. Abdella 1095
 El Setouhy, Maged A. **131**, 1112
 El Tigani, Rahma 131
 El-Hossary, Shabaan S. I. 54, 847
 El-Sayed, Badria B. 346
 El-Shehabi, Fouad **741**
 Elamin, Mohamed 404
 Elder, John 894
 Eldridge, Bruce F. 1092
 Elguero, Eric 685
 Elie, Cheryl 264, 883
 Elisante, R. 438
 Elizondo-Quiroga, Darwin 732
 Elling, Berty F. 614
 Ellis, Brett R. **907**
 Ellis, Magda K. **357**, 399
 Ellis, Ruth D. **22**, 24, 622, **642**, 1005, 1039
 Elmahdi, Ibrahim 404
 Elmendorf, Heidi G. 281
 Elnahas, Ayman 404
 Elnaiem, Dia-Eldin 921, 918
 Elufioye, Taiwo T. 453
 Emerson, Paul M. 35, 216, 335, 1003, 1157
 Enabulele, Onaiwui 151
 Endeshaw, Tekola 35, 216, 1003
 Endy, Timothy P. 120, 484, 891
 Enevold, Anders 328
 Ensore, Russell E. 419
 Enyong, Peter 384
 Epstein, Judith E. 7, 1034
 Epstein, Paul R. **78**
 Erasmo, Jonathan Neil 115
 Erasmus, Panna 377
 Erb, Steven M. **489**
 Erdman, Dean D. 800
 Erdman, Laura **1200**
 Eremeeva, Marina E. 480, **777**
 Erhart, Annette 409, 567, 994, 1051
 Erickson, Sara 428, 519, 521
 Ernst, Sylvia 180
 Esamai, Fabian 764
 Esan, Michael O. **476**
 Escalante, Ananias A. 198, 214, 343, 408, 594, 1033
 Escobar, Gustavo 981
 Esfandiari, Javan 68
 Eshita, Yuki 8
 Espérance, Ouédraogo 856, 877, 1035
 Espinosa, Avelina **813**
 Espinosa, Benjamin J. 563, 632, 1014, 1025
 Espinosa, Diego **1202**
 Espinoza, Manuel 914
 Essbauer, Sandra 494
 Esteban, Margarita T. 273
 Estrada, Gabriela 1083
 Etienne, Manuel Etienne 1221
 Etouna, Joachim 1169
 Etsane, Elsie 827
 Etyreddy, Damodar 6
 Euan-Gracia, Maria 844
 Evans, A. 950
 Evans, J. 28
 Ewers, Christina 1140
 Eyase, Fred 983
 Eyong, Ebangha Joan 384
 Eyzaguirre, Eduardo J. 1126
 Eza, Dominique 272
 Ezedinachi, Emmanuel 764
- F**
- Facchinelli, Luca 693
 Factor, Stephen M. 558, 565
 Fae, Kellen C. 161
 Fagbenro-Beyioku, Adetayo F. 191
 Fahmy, Adel R. Fahmy 442
 Fair, Joseph **714**
 Fairfax, Keke C. **814**
 Fairhurst, Rick M. 220
 Falade, Catherine O. **79**, 172, 174, **398**, **948**
 Falendyz, Elizabeth 1161
 Famenini, Shannon **861**
 Famulok, Michael 515
 Fan, Erkang 977
 Fang, Chi-Tai 114, 482
 Fang, Y. 256
 Fansiri, Thanyalak 734
 Faragher, Eric B. **474**
 Farfan-Ale, Jose Arturo 732, 809
 Farombi, Olatunde 948
 Farooq, Muhammad 1058
 Farrar, Jeremy 1224
 Farraye, Francis A. 1151
 Faruque, Abu S. G. 365, 415
 Farzelli, A. 708
 Fatmi, S. Nadeem 18
 Faucher, Jean-François **77**, **1191**
 Fávoro, Camila A. 116, 124
 Fawaz, E.Y. 847
 Fay, Michael P. 22, 24, 642
 Faye, Ngor 1165
 Faye, Ousmane 866, 1106, 1165
 Featherstone, David A. 834
 Fedders, Charlotte 7
 Fedorko, Daniel 420
 Feikin, Daniel R. 100, 101, 102, 368, 370, 372, 615, 803
 Felger, Ingrid 995
 Felgner, Philip L. 621
 Felices, Vidal 1100
 Feng, Dan 1167
 Fentie, Gashu 216
 Fenwick, Alan 308, 752
 Ferdig, Michael T. 990, 1123
 Ferguson, Heather **247**
 Fernández, Janett 240
 Fernandez, Kate 812
 Fernandez, Miguel 709
 Fernández, Olga L. **466**
 Fernandez, Roberto 850

- Fernandez-Salas, Ildefonso 1066
 Fernandez-Sesma, Ana **43**
 Ferrari, Marilyn E. 1037
 Ferraz, Gonçalo 51
 Ferreira, Carolina 71
 Ferreira, Marcelo U. 225, 634
 Ferrell, Robert 640, 1022, 1230
 Ferrer, Pablo 1103
 Ferrer, Santiago 590
 Ferrés, Marcela 713, 1103, 1127
 Ferro, Cristina 687, 744
 Ferruffino, Lisbeth 1201
 Ferruti, Paolo 30
 Fieck, Annabeth **1146**
 Fiestas, Victor 485
 Fife, Amy M. 523
 Figueroa, Dana **906**, 914
 Figueroa, Maria Elena 99
 Figueroa, Roger 454
 Figueroa-Angulo, Elisa **164**, 556
 Fijnheer, Rob 1185
 Filice, Carlo 405, 443
 Filipe, Joao A. N. 32
 Filler, Scott 93, 216
 Fillinger, Ulrike **259**, 688
 Fillol, Florie **324**
 Findlow, Helen 264
 Findlow, Jamie 883
 Fine, Donald 62, 720
 Finney, Constance 1187, 1198
 Finney, Olivia **1229**
 Fischer, Kerstin **522**
 Fischer, Peter 429, 433, 522, 1112, 1113
 Fitoussi, Serge 568
 Fitzpatrick, Kelly A. 910
 Fitzpatrick, Nicole 126, 388
 Fitzsimmons, Colin M. 300
 Fleckenstein, Lawrence 457, 851, 855
 Flisser, Ana **39**, **437**
 Florencio-Martinez, Luis E. 164, 562, 556
 Flores, Adriana E. 1061, 1063, 1067
 Flores, Diana 127
 Flores, Rosemary 356
 Flores Leon, Amilcar A. **554**
 Flores-Flores, Luis 732
 Flores-Mendoza, Carmen **850**, 1088
 Flores-Perez, Carlos 164
 Florey, Lia S. **996**
 Florin, David 850, 1088
 Fobia, W. 796
 Focks, Dana A. 1091
 Fofana, Abdrahamane 50
 Fogako, Josephine 1015
 Folarin, Onikepe A. **597**
 Foley, Jonathan A. 685
 Fondjo, Etienne 50
 Fongang, René S. 187
 Fonnice, Richard 1130
 Fonseca, Benedito A. L. **116**, **117**, **124**
 Fonseca, Dina M. 1073, **1086**
 Fonseca-Coronado, Salvador 437
 Fontaine, Michael C. 746
 Fontenille, Didier 746, 1079, 1169
 Fontes, Erica 22
 Foppa, Ivo 255, 509, 510
 Ford, Louise 430, **431**
 Ford-Jones, E. Lee 262
 Fornadel, Christen M. **252**
 Forrat, Remi **386**, **387**
 Forrest, Gerry 989
 Forshey, Brett M. 272, 316, **1099**
 Fortes, Filomeno 71, 1219
 Foster, Jeremy 516, 518
 Foster, Stanley O. 524
 Foster, Woodbridge A. 736
 Fottrell, Edward 173
 Foumane, Vincent 1219
 Fournier, Didier 233
 Fox, Ashley M. **828**
 Fox, LeAnne 136, 1118
 Foxman, Betsy 413
 Foy, Brian D. 667, 769, 770, 1065, **1108**
 Fracisco, Susan **758**
 Fraga, Lucia A. **303**
 Francis, Filbert 23, 195
 Franco, Jose R. 542
 Franco, Jose R. 542
 Franka, Richard 265
 Franz, Alexander W. E. 122, 1085
 Frédéric, Pagès 1217
 Fredrik, Fredrik 716
 Freeman, Jennifer C. 537
 Freeman, Randall J. **711**
 Freilij, Hector 923
 Freire, Janaine 1175
 Freitas, Gisele D. **423**
 Fremont, Daved H. 804
 Frempong, Kwadwo K. **235**
 French, Michael D. **334**
 Frenkiel, Marie-Pascale 805
 Fretes, Ricardo E. 923
 Freund, Yvonne 162, 1205
 Freye, J. D. 478
 Friberg, Heather L. **889**
 Fried, Michal 743, 1124
 Friedman, Jeffery 581
 Friedman, Jennifer F. **331**
 Frontado, Hortencia L. 134
 Fry, Alicia 800
 Fryauff, David 876
 Frye, Tyler 743
 FSS Peruvian Working Team 1099
 Fuchs, Jeremy 519, 521, 663
 Fugmann, Burkhard 450
 Fukuda, Mark 327, 997, 1120
 Fullhorst, Charles F. 1126
 Fuller, Douglas O. 684
 Furman, Barry D. 54, 847
 Furuya, Tetsuya **939**
 Fusai, Thierry 972
 Futami, Kyoko 699, 1056
- G**
- Gab, Siew 1193
 Gabor, Julian 199
 Gaboulaud, Valerie 1223
 Gadalla, Nahla B. H. **346**
 Galagan, James E. 1211
 Galán Herrera, Juan F. 387
 Galappaththy, Gawrie N. L. 226
 Galdos, Gerson 1201
 Galeno, H. 1103
 Galinski, Mary R. 999
 Gall, Jason 644
 Gallego-Gomez, Juan C. 498
 Gallegos, Juan 118
 Galloway, Renee L. 266
 Galvani, Alison 697
 Gálvez, Hugo 272
 Gambhir, Manoj **137**
 Gamboa, Dionicia **559**
 Gamboa-Leon, Rubi **860**
 Ganaba, Rasmané 40, 41
 Ganesan, Shobana **857**
 Ganeshan, Harini 1034, 1037
 Gangnon, Ronald 685
 Ganley-Leal, Lisa M. 362, 1151
 Gansané, Adama 1017, 1031, 1041
 Gao, Qi 245
 Garba, Amadou 464
 García, Adolfo **590**
 García, Andres J. 1091
 García, Enid 898
 Hector H. García 440
 García, Josefina 269, 1101
 García, Josselyn 417
 García, Juan 706
 García, Maria **485**, **914**
 García, Paquita 118
 García, Patricia 1129
 García Rosa, Miryam 190
 García-Rejon, Julian E. 732, 809
 García-Sastre, Adolfo 43
 Gardon, Jacques 1156
 Gargallo-Viola, Domingo 586, 587, 590, 706, 971
 Garner, Jason 799
 Garrido, Fátima 113, 491
 Garry, Robert 714
 Garten, Rebecca J. 802
 Garuti, Helen 586, 587
 Gatei, Wangeci **214**, 1033
 Gatlin, Michael R. **358**
 Gatton, Michelle 600, 616, 1121
 Gausi, Khoti 216
 Gautam, Sant P. 1011
 Gaye, Umar 470, 471, 967
 Gaywee, Jariyanart 267, **801**
 Gbotosho, Grace O. 574, 597, 974
 Gbotosho, Sola 174
 Geary, Timothy 140
 Gebre, Teshome 35, 216, 527, 1003
 Gebregeorgis, Elizabeth 1047
- Geiger, Stefan M. 133
 Geisbert, Joan 714
 Geisinger, Frank 383
 Gelb, Michael H. 977
 Geldof, Sarah 296
 Genestra, Marcelo 919
 Genton, Blaise 170, 394, 397, 577, 585, 947
 George, Phillip **675**
 Gerena, Lucia 176, 583, 970, 979
 German, Polina 575
 Gerstoft, Jan 155
 Gesase, Samuel 23, 26, 96, 441, 601
 Geske, Jon 714
 Getachew, Asefaw 35, 216
 Getis, Arthur 49
 Gettayacamin, Montip 758, 970
 Getz, Wayne M. 1132
 Ghabri, Salah 424
 Ghani, Azra 31, 32, 795, 997
 Ghebreyesus, Tedros Adhanom 35, 1003
 Ghedin, Elodie 520
 Ghersi, Bruno M. 309, 320, **719**
 Ghorashian, Sara 424
 Ghosh, Anil K. 30
 Ghosh, Kashinath **925**
 Gibbons, Robert V. 48, 125, 385, 389, 891
 Gicheru, Michael M. 788
 Gies, Sabine **605**, **606**, 619, **821**
 Gil, Ana I. 367
 Gilbert, Alexa **483**
 Gilman, Robert H. 278, 282, 440, 798, 1201
 Gilpin, Christopher M. 703
 Gimnig, John E. 214, 689, 690, 1033, 1052
 Giraudoux, Patrick 403
 Girouard, Autumn 1143
 Gitawati, Retno 1183, 1194
 Githeko, Andrew K. 603, 1002
 Githure, John I. 672
 Gladwin, Mark 1182
 Glass, Gregory E. 112, **713**, 1107
 Glass, Pamela 62
 Gleeson, Todd 95
 Gleim, E. 532
 Glen, Jacqueline 3, 1038
 Glenn, Justin D. 747
 Glennon, Erin G. 273
 Goade, Diane 504
 Goba, Augustine 714, 1130
 Gobern, Lorena 777
 Gobert, Geoffrey N. 399, 739, **753**
 Godeaux, Olivier 25, 647, 1036
 Godoy, P. 1103
 Goel, Ashish 65, 80, 82
 Goel Venugopal, Priyanka 379
 Goethert, Heidi K. **779**, 781
 Goez-Rivillas, Yenny 899, 900
 Goh, Li-Ean 179, 584
 Goldin, Robert 1224

- Gomes, Adriana 920
 Gomes, Melba 570
 Gomes, Regis 866, 918, 921
 Gomes-Ruiz, Alessandra C. 117
 Gomez, Giovan F. 698, 1077
 Gómez, Jorge 1099, 1101
 Gomez, Tangni 47
 Gómez, Vanesa 586, 587
 Gomez-Carro, Salvador 732
 Gomez-Escobar, Natalia 773, 930, 1016
 Gomez-Hurtado, Claudia M. 556
 Goncalves, Loredana 166
 Gonçalves, Lúcia A. 227, 629
 Gonul, Engin 435
 Gonzales, Armando E. 309, 440
 González, Anajulia 165
 Gonzalez, Adalberto 552
 Gonzalez, Armando E. 719
 González, John J. 698
 Gonzalez, Publio 1107
 Gonzalez, Rosa I. 719
 Gonzalez-Martinez, Pedro 732
 Gonzalez-Ramirez, Claudia 860
 Gordon, Aubree 14, 47, 126, 388, 705
 Gore Saravia, Nancy 915
 Goshit, D 874, 1117
 Gosling, Roly D. 32, 96, 441
 Goto, Yasuyuki 564
 Gottdenker, Nicole L. 768
 Gotuzzo, Eduardo 109, 1099
 Goud, Gaddam 815
 Goud, Ravi 1009
 Gould, J. 26
 Gourbière, Sébastien 844
 Gourmel, Bernard 77
 Gouvras, Anouk N. 308
 Gowda, D. Channe 1187
 Gowda, Kalpana 5, 1037
 Gracia, Fernando 1107
 Graczyk, Thaddeus 1143
 Graeff-Teixeira, Carlos 1176
 Grainger, John R. 1243
 Grainger, Munira 624
 Grais, Rebecca F. 1223
 Gramajo, Rodrigo A. 869
 Granger, Don 1194
 Granger, Stewart P. 17, 263
 Graves, Patricia M. 35, 216, 527, 1003
 Gray, Michael 269
 Green, Clare 688, 793
 Green, Justin A. 269
 Green, Sharone 484
 Greenaway, Christina A. 1227
 Greenfield, Joann 212
 Greenhouse, Bryan 598, 818
 Greenwald, Rena 68
 Greenwood, Brian 28, 96, 324, 441, 462, 584, 726, 764
 Gregory, Kellan 180
 Grewal, Paul 2
 Grieco, John P. 242, 260, 850
 Grieser, Heather 472
 Griffin, Jamie 32, 795, 997
 Griffin, Jennifer B. 1000
 Griffing, Sean M. 408
 Griffith, Kevin S. 419
 Griffith, Matthew E. 275
 Griffiths, Kathryn 519, 521
 Grijalva, Mario J. 51, 417
 Griko, Natalya 660, 1064
 Grillet, Maria Eugenia 134
 Grisolia, Antonella 405
 Grobusch, Martin 199
 Grobusch, Martin P. 400
 Groot, Evelyn 1185
 Gruener, Beate 400, 402
 Gryseels, Bruno 364, 1150
 Gu, Weidong 1080
 Gu, Yuanchao C. 185
 Guan, Zhong 1075
 Guclu Kilbas, Zeynep 435
 Guégan, Jean-François 685
 Guelbeogo, Wandaogo M. 1059
 Guerin, Bruno 402
 Guerin, Philippe J. 966, 1223
 Guerra, Bruna M. 1021
 Guerra, Humberto A. 878
 Guerrant, Richard L. 104, 107, 288
 Guevara, Carolina 312, 1099, 1100, 1128
 Guiguemdé, Robert 764, 1082, 1084
 Guimarães, Ana 430
 Guimarães, Luiz H. 161, 1203
 Guindo, Amadou 249
 Guindo, Aldiouma 220, 787, 1005
 Guindo, Ando B. 25, 1036
 Guindo, Boubacar 787
 Guindo, Merepen A. 24, 787, 1005
 Guindo, Ousmane 24
 Guionaud, Christophe Guionaud 1144
 Guirado Sayago, Esther 701
 Guirou, Etienne 94, 987
 Gul, Hanefi C. 543
 Gule, C. 438
 Gunasekera, Anusha M. 1, 228
 Gunsaru, Bornface 975
 Guo, Jia G. 403
 Gupta, Lalita 1070
 Gupta, Priti 1006
 Gupta, Richi 815
 Gupta, Shuchita 530
 Gupta, Shweta 530
 Gupta, Vineet 80, 82
 Gurley, Emily S. 319, 712, 715, 1131, 1222
 Gürtler, Ricardo E. 58
 Gut, Jiri 187
 Gustiani 896
 Gutierrez, Escobar 887
 Gutiérrez, José M. 1076
 Gutiérrez, Lina A. 686, 698, 1077
 Gutierrez, Sonia 1026
 Gutiérrez, Victoria 118, 485, 914
 Gutiérrez-Espeleta, Gustavo 1076
 Gutteridge, Clare E. 583
 Guttieri, Mary 714
 Gwanmesia, Philomina 1015
 Gyapong, John 462, 1228
- ## H
- Ha, Do Q. 12, 893
 Haag, Karen L. 654
 Haake, David A. 68
 Haaland, Ane E. 1055
 Habbanti, Shadrack 252
 Habbema, J. D. F. 1159
 Hackett, Caroline 222
 Hadi, Azam 761
 Haerter, Georg 400
 Hafy, Zen 13, 716, 896
 Hahn, Matthew W. 679
 Haidara, Fadima C. Coulibaly 264, 883
 Haider, M. Sabbir 1222
 Hailemariam, Afework 35, 1003
 Haissman, Judith M. 155
 Halder, Amal K. 17, 263
 Hale, DeVon C. 460, 881
 Hall, Andrew 1148, 1149
 Hall, Eric R. 109, 269, 367
 Hall, Nancy 1140
 Hall, Peter 17
 Haller, Alla 962, 963
 Hamade, Prudence 966
 Hamel, Mary 72, 214, 372, 615, 826, 1033
 Hamer, Davidson H. 602, 1006, 1008
 Hamer, Gabe 1098
 Hamilton, Melissa 644
 Han, Eun-Taek 942, 968
 Han, Pauline 461
 Hanafi, Hanafi A. 54, 847
 Kathy Hancock 440
 Handali, Sukwan 439, 440, 532
 Handunnetti, Shiroma M. 1032
 Hanlan, Liu 578, 579
 Hanley, Kathryn A. 9
 Hanlon, Cathleen A. 718
 Hanson, Kara 169, 998
 Hansson, Helle H. 328
 Hao, Bing 938
 Happi, Christian T. 174, 574, 597, 974
 Hapuarachchi, Hapuarachchige C. 593
 Haque, Rashidul 277, 289
 Haraoui, Louis-Patrick 544
 Hardesty, Doug 222
 Harding-Esch, Emma 1225
 Harnett, Margaret 1151
 Harnett, William 1151
 Harrell, Emma 584
 Harrington, Whitney E. 1124
 Harris, Aaron M. 365, 415
 Harris, Caroline 1079
 Harris, Eva 14, 45, 47, 126, 127, 388, 495, 705, 733
 Harris, Jason B. 365, 414, 415
 Harris, Juliana V. 1208
 Harris, Maghan 1140
 Harris, Stephanie 1140
 Harrison, Lisa M. 814
 Hart, Mary Kate 720
 Hartl, Daniel L. 406, 634, 1211
 Hartsel, Joshua A. 1216
 Hartzell, Joshua D. 95
 Harvey, William R. 1171
 Hasan, Che Abdullah 1179
 Hasanuddin, A 796
 Hashim, Kamal 1160
 Hashim, Ramadhan 96
 Hashmi, Ahmar H. 602
 Hasing, Maria Eloisa 1164
 Haskell, Jacquelyn N. 353
 Hassan, Adiba 880
 Hassan-King, Musa 264
 Hassanali, Ahmed 81
 Hategekimana, Celestin 148
 Havlir, Diane 575, 824
 Havryliuk, Tatiana 604
 Hawkes, Michael 322
 Hawkins, Vivian N. 593
 Hawley, Joshua A. 275
 Hawley, William A. 214, 1033
 Hayden, Mary H. 57
 Hayes, Daniel J. 731
 Hayes, Siobhan 179
 Haynes, J. David 839
 Haynes, Richard K. 450
 Hayton, Karen 774
 Headley, Virginia 799
 Hebbar, Santosh 1226
 Heinz, Michael 429, 432, 427, 429
 Helber, Sarah 62
 Helbok, Raimund 1190
 Helve, Tapani 317
 Hemingway, Janet 234, 475, 1215
 Hemme, Ryan R. 1074
 Hemphill, Andrew 286, 402, 1144, 1145
 Hencke, Jan 289
 Henderson, Ralph 1112
 Hendricks, A 950
 Hendrix, Craig W. 762
 Henn, Matthew 47, 123
 Henriques, Daniele F. 721
 Henry, Cara N. 607
 Henttonen, Heikki 722
 Heppner, D G. 25, 646, 647, 969, 1036
 Herbein, Joel 289
 Hernandez, Ariosto 1107
 Hernandez, Carlos 733
 Hernandez, Roger 704
 Hernandez, Vincent 162
 Hernandez, Y 1127

- Hernández-Osorio, Luis A. 562
Herrera, Eugenia 943
Herrera, Raul 3
Herrera-Aguilar, Melba 844
Herrerros, Esperanza 971
Herwaldt, Barbara L. 541
Hess, Ann M. 667
Hettiarachchi, Gaya 222
Hetzl, Manuel 396, 573
Hickey, Patrick W. **610**
Hickman, Merrit 3
Hidayatullah, N. 708
Hien, Tran Tinh 633
Higgs, Stephen **513**, 1111
Hightower, Allen W. 212, 689, 690
Hill, David R. **852**
Hillyer, Julián F. 659, **747**
Himley, Steven 875
Hinkle, Mary K. **269**
Hinnebusch, B. Joseph 782
Hinrichs, Dave 760
Hira, Parsotam R. **1226**
Hirabayashi, Naomi 1044
Hirayama, Kenji 12, 893
Hirunkanokpun, Supanee **238**
Hise, Amy G. 380, 529
Hitchcock, David 17
Hittner, James B. 339, 371, 936
Hjelle, B 1103, 1127
Hlavsa, Michele 1140
Hoar, Sandy **244**
Hobbs, Maurine R. 881
Hocart, Simon J. **580**
Hoch, Jeffrey C. 938
Hochman, Sarah 928
Hodanics, Charles J. **867**
Hodel, Eva Maria **170**
Hodgson, Abraham 876
Hodson, Cheryl 975
Hoekstra, Robert M. 20, 106
Hoel, D. F. **847**
Hoerauf, Achim 383, 515
Hofer, Sandra 974
Hoffman, Benjamin U. 228
Hoffman, Nelia **1009**
Hoffman, Stephen L. 1, 176
Hohman, Moses 180
Hohmann, Elizabeth 414
Hol, Wim G. J. 977
Holbrook, Michael R. 831
Holford, Theodore 687
Holland, Martin J. 1225
Holmes, Elaine 352, 363, **885**
Holmes, Edward C. 125
Holt, Deborah C. 52, 854
Holtzman, Douglas 356
Homaira, Nusrat 319
Homma, Akira 68
Homsy, Jaco 729, 944, 1050
Hong, Sung-Jong 291, 292
Hong, Young S. 664, **666**
Hongrimumuang, Thongchai 635, 637
Hooper, P.J. **528**
Hopkins, Donald R. 1117
Hopkins, Heidi **395**, 576
Hopkins Sibley, Carol 593
Hopper, Jessica E. 845
Horie, Hitomi 12, 893
Horio, M. 1056
Horna, Gertrudiz 704
Hospenthal, Duane R. 266, 269, 275
Hossain, M. Jahangir 319, 712, 715, 1131, 1222
Hotez, Peter J. 815, 1175
Houde, Nathan 406
Houdek, Jason W. 1083
Hougard, Jean-Marc 233, 765, 1218
Houghton, Jenny **300**
Hounton, Sennen 40, 41
House, Brent 3, 25, 458, 647, 1034, 1036
Houzé, Pascal 77
Hovav, Einat 809
Howard, Randall F. 564
Howard, Robin S. 544
Howlett, Lindsey 222
Hoyos, Catalina **309**
Hoyos, Oladier 497
Hsiao, Hui-Mien 46
Htun, Khayae 966
Hu, Fu-Chang 482
Hu, Renjie 480
Hu, Susan C. 492
Hu, Yan 1177, **1178**
Huaman, Moises A. 316, **709**, **1100**, **1128**
Huang, Chiung-Yu 620
Huang, Claire Y. 489, 493, 507, 511, 892
Huang, Junjun 551, 810
Huang, Jan-Jang S. 496
Huang, Min-Tze 492
Huang, Shuhui 1047
Huang, Tien L. **557**
Huang, Yuefang 427, **517**
Huang, Yan-Jang S. 492
Hubbard, Alan 364, 818
Hübner, Marc P. 144, 378, **786**
Huddleston, Dora B. 810
Hughes, David M. 989
Huhtamo, Eili 317
Hume, Jennifer 748, 941
Hunsperger, Elizabeth 502, 886
Hunter, Meredith 566
Huong, Vu T. Q. 12, 893
Hurwitz, Ivy 1146
Husain, Sohail 814
Husain, Tupur **1046**
Hussain, Mobassir 602
Hutagalung, Robert 966
Hutchinson, Robert 793
Hutchison, Coll 820
Huy, Rekol 113, 491
Huyse, Tine **296**
Hviid, Lars 627
Hwang, Jimee 35, **212**, 216
Hyseni, Chaz 53
-
- I
Iams, Keith P. 1161
Iamsa-aad, Wilarwan 110
Iamsirithaworn, Sopon 385
Ibáñez, Javier 586, 587
Ibañez, R. 1103
Ibarra-Juarez, Luis 501
Ibrahim, B. 1117
Ibrahim, I. N. 708
Ibrahim, Mohamed **660**, **1064**
Ibrahim, Yehia S. 361
Icochea, Eliana 719
Idigbe, Emmanuel O. 455
Idika, Nneoma **455**
Idoko, Olubukola T. O. **264**, **883**
Idro, Richard 85
Iglesias, Rodrigo 309
Ijaz, M. Khalid **284**
Ikeda, Makiko 8
Ilboudo-Sanogo, Edith 1059
Ilett, Kenneth F. 1195
Ilika, Amobi L. I. **1053**
Ilunga, Medard 424
Imes, Tiffany D. 1130
Imwong, Mallika 633
Indrawan, M. 708
Iriko, Hideyuki 1043
Irving, Helen 1215
Isanaka, Sheila 1223
Isham, Valerie 1155
Ishengoma, Deus 195, 345, 601, 608
Ishikawa, Tomohiro **499**, 807
Islam, M. Sirajul 17, 263, 712, 715, 1222
Isoe, Jun 657, 1136
Issa, Nébié 856, 877, 1035
Issiaka, Soulama 856, 877, 1035
Issifou, Saadou 1190
Istvan, Eva S. 1236
Iteman, Isabelle 805
Itoh, Takaaki 1218
Ivens, Alasdair 773
Iyiola, Toyin 174
Izci, Yusuf 435
-
- J
Jabes, Daniela 976
Jackson, Bryan T. 1216
Jackson, Felix R. 312
Jacob, Benjamin G. **1081**
Jacob, Shevin 73
Jacobs, Robert 162, 537, 538, 1205
Jacobs-Lorena, Marcelo 30, 838
Jacobson, R. R. 61
Jacobus, David P. 973
Jacobus, Laura R. 973
Jadhav, Suresh 264
Jahid, Iqbal 263
Jaidee, Anchalee 200, 1123
Jain, Vidhan **341**, 984, 1011
James, Cummings 647
James, Eric R. 1
James, Stephanie **1104**
Jamieson, Frances 262
Jamieson, Sarra E. 161
Janda, Kim D. 740
Jang, I. J. 457, 851
Jangyodsuk, Vim 801
Jani, Dewal 811
Janka, Jacqueline **1182**
Jaramillo, Luz M. 686
Jaramillo-Gutierrez, Giovanna 1170
Jarilla, Blanca 331
Jarman, Richard G. **125**, 385, 389, 801, 891
Jarrett, Clayton O. 782
Jasseh, Momodou 735
Javed, Anam **1135**
Jawara, Musa 793, 1168
Jeamwattanalert, Pimmada **267**
Jean Baptist, Yaro 856, 877, 1035
Jean-Marc, Hougard 1217
Jeffries, David 793
Jelicks, Linda A. 558
Jennifer, Keiser 236
Jenwithisuk, Rachaneeporn 980
Jerônimo, Selma M. B. 421, 872
Jessup, Kira 86
Jetsumon, Sattabongkot 245
Jha, Bharat 1147
Jia, Na 1167
Jiamton, Sukhum 113, 491
Jiang, Daojun **514**
Jiang, Desheng 815
Jiang, George 1018
Jiang, Jianlin 650
Jiang, Suping 1207
Jima, Daddi 35, **216**, 1003
Jiménez, Magdalena 586
Jiménez, Mirna 1101
Jiménez-Díaz, Belén **586**, **587**
Jin, Albert 3
Jin, Chaoyang **1173**
Jin, Xia 11, 44, 486, 490
Jin, Xiannu **978**, 979, 980
Jip, Nimzing 335, 874, 1157
Jiz, Mario A. 331
Jochim, Ryan C. **848**
Johansen, Maria Vang 37, 438
Johansson, Michael A. **112**
John, Chandy C. 85, 337, 1007, 1019, 1020, 1184, 1213
John, Davis 641
Johnson, Alison J. **500**, 512
Johnson, Barbara W. 834, 904, **905**
Johnson, David J. **1024**
Johnson, Jane 904
Johnson, Jacob 472, 970, 983
Johnson, Kelsey 1007

- Johnson, Kiersten B. **1048**
 Johnson, Marla K. 822
 Johnson, Patricia J. 285
 Johnson, Syd 804
 Johnson, Wesley O. 1092
 Johnston, Kelly L. **430, 431**
 Johnston, Stephanie P. **287, 456, 826, 1140**
 Joloba, Moses 591, 598
 Jones, Caroline 572, 998
 Jones, Franca R. 109
 Jones, Jane 852
 Jones, Jeffrey L. **1142**
 Jones, Kristin 511
 Jones, Therese 17
 Jones, Timothy F. 478, 551, 810
 Jongsakul, Krisada 763, 1120
 Jongwutiwes, Somchai **635, 637**
 Jorakate, Possawat **702**
 Jordan, Alexandra 852
 Jordan, Stephen J. **653, 1045**
 Jordan, Thomas W. 742
 Jortrakate, Possawat 418
 Joseph, Chabi 1217
 Josepha, Maya 1182
 Joshi, Hema 224
 Jost, Christiane A. 804
 Juerg, Utzinger 89, 89, 236
 Juliano, Jonathan J. 539, **611, 613**
 Juliao, Patricia C. **106**
 Juma, Elizabeth A. **168, 953**
 Juma, O. 27
 Jumanne, A. 27
 Junco Diaz, Raquel 1150
 Junpee, Alisa **526**
 Jusuf, Hadi 896, 897, 1109
- K**
- Kabali, Conrad 138
 Kabanywany, Abdunoor M. **585, 947, 982**
 Kabat, Juraj 36
 Kabatereine, Narcis 300, 359, 725, 752
 Kabeya, Alain M. 542
 Kabir, Mamun 289
 Kachur, S. Patrick 72, 175, 212, 614, 956
 Kaddu-Mukasa, Mark 882
 Kaewpan, Anek 418
 Kafatos, Fotis 1078
 Kafsack, Björn F. C. 1238
 Kahama-Maró, Judith **394, 397, 577**
 Kahigwa, Elizeus 175, 614, 956
 Kain, Kevin C. 322, 1184, 1187, 1198, 1200, 1209, 1214
 Kaiser, Christoph 130
 Kajaste-Rudnitski, Anna 805
 Kakabadse, Dimitri 413
 Kakuru, Abel 729, 944, 1050
 Kal, Alphonsus 1117
 Kalakheti, Balakrishna 447
 Kalomya, Julius 729, 944, 1050
 Kalanidhi, A. P. 493, 892
 Kalavsky, Erich 156
 Kalayanarooj, Siripen 120, 484
 Kaldas, Rania M. Kaldas. 442
 Kalil, Jorge 161
 Kalilani, Linda 75
 Kalyango, Joan 824
 Kamal, Hussein 131
 Kamalamba, John 823
 Kamanga, Aniset 305
 Kamate, Beh 24
 Kamdem, Colince 1169
 Kamgno, Joseph 1156
 Kamhawi, Shaden 866, 918, 921
 Kaminski, Dorothy 43
 Kamiza, Steve 772
 Kamugisha, Mathias L. 608
 Kamyra, Moses R. 84, 93, 177, 729, 730, 816, 818, 822, 824, 944, 1050, 1125
 Kande, Victor 424
 Kaneko, Akira 29
 Kaneko, Osamu 840
 Kaneko, Satoshi 699, 1056
 Kang, Seokyoung **664, 666**
 Kang'a, Simon 224
 Kannady, Khadija 259
 Kanneh, Lansana 1130
 Kante, Ousmane 24, 787
 Kao, Chuan-Liang 492, 496
 Kappe, Stefan H. I. 410, 837
 Kapre, Subhash 264
 Kaptue, Lazare 962
 Karanja, Diana M. S. 297, 299, 302, 330, 332, 333, 358, 362, 788
 Karema, Corine K. 791
 Kariuki, Curtis H. 308
 Kariuki, Simon 72, 214, 594, 1033
 Karunajeewa, Harin A. **1195**
 Karunakara, Unni 424
 Karunaweera, Nadira D. 549, 550, **634, 842**
 Kashinath, Ghosh 555
 Kasongo, Webster 323
 Kasparian, Serena 424
 Kasper, Jacob M. 775
 Kasper, Matthew R. 105, 426
 Kassuku, Ayub A. 38
 Kastens, William 1115, 1158
 Katarbarwa, Moses 527, 1160
 Kataraihya, Johannes B. 195
 Kateera, Fredrick K. **824**
 Kato, Kentaro **412**
 Kats, Lev M. 812
 Katureebe, Agaba 93
 Katzenstein, Terese 155
 Kaul, Surinder 121
 Kauth, Christian W. 1011
 Kawamoto, Fumihiko 634
 Kawuondo, K. 26
 Kayala, Matt 621
 Kayatani, Alexander K. K. **327**
 Kayentao, Kassoum 94, **220, 325, 620, 621, 987**
 Kazadi-Kyanza, Serge 424
 Kazura, James W. 215, 326, 380, 529, 651, 1020, 1112, 1115, 1158
 Ke, Hangjun **1030**
 Keating, Joseph A. 592, 631, 794
 Keenan, Alexandra B. **916**
 Keep, Lisa 711
 Keiser, Jennifer 170, 363
 Keita, Adama D. **128, 129**
 Keita, Mahamadou 797
 Keita, Somita 866
 Kellam, Lynda 764
 Keller, Christopher 1230
 Kelley, Angela M. 977
 Kelly, Ann 793
 Kelly, John D. 16
 Kelly, Jane X. **760, 975**
 Kelly, Rosmarie 810
 Kenangalem, Enny 796, 935, 1183, 1194
 Kendjo, Eric 1190
 Kengne, Pierre 1060
 Kenney, Joanie 9
 Kent, Rebekah J. **261, 671**
 Kenya-Mugisha, Nathan 73
 Kerguelen, Juan D. 943
 Kerin, Tara 98
 Kern, Marcia 679
 Kern, Peter 400, **402**
 Kern, Steven E. 171
 Kern, Winfried V. 402
 Kessy, Flora 396, 573
 Kester, Kent 646
 Khadga, Prem Kumar 66
 Khalid, Nabila 1226
 Khalil, Insaf F. 345
 Khan, Ashrafal I. 415
 Khan, Humarr 714
 Khan, M. S. U. 712, 715, 1131
 Khan, Shane **217, 1054**
 Khan, Sheik Humarr 1130
 Khanal, Basudha 445, 447
 Khantikul, Nardlada **167**
 Khatib, Rashid A. **614, 956**
 Khatun, Selina 1222
 Khoo, Cynthia C. H. **1085**
 Kiasi, Nsa 875
 Kiechel, Jean-Rene 859, 873, 1193
 Kifude, Carolyne M. **965**
 Kiggundu, Moses 591, 598
 Kigozi, Ruth 816
 Kihara, Jimmy 334
 Kikuchi, Mihoko 12, 893
 Kilian, Albert **1052**
 Kilima, Peter 1116
 Killeen, Gerry 247
 Kim, Charlie C. 336
 Kim, Jung-Yeon 968
 Kim, Kami 928
 Kim, Mijung **1138**
 Kim, Tong-Soo 291, 292
 Kim, Tae Im 291, 292
 Kima, Peter 354
 Kimani, Gachuhi 300, 359
 Kimbi, E. 438
 Kimbi, Helen K. K. **193**
 Kimera, S. 438
 Kimmel, Rhonda 326, 651
 Kimweri, Angela 175
 Kines, Kristine J. **739**
 King, Chwan-Chuen 114, 482, 492, **496**
 King, Christopher 607
 King, Chris 625, 628
 King, Charles H. 996, 1132
 King, Christopher L. 294, 639, **785, 1115, 1233**
 King, C. R. 5, 6, 7, 634, 651, 644, 1034, 1037
 King, Jonathan D. **335, 874, 1114, 1157**
 King, Jonas G. **659, 747**
 Kinney, Richard M. 493, 511, 892
 Kioko, John 785
 Kipp, Walter 130
 Kiptui, Rebecca 212
 Kirby, Jordona 551
 Kirby, Matthew J. **735**
 Kirby, Paula L. 764
 Kirk, Kiaran 841
 Kironde, Fred A. S. 882
 Kirsch, Philipp 1097
 Kisoka, William J. 525
 Kitron, Uriel 58, 894
 Kitua, Andrew Y. 601
 Kiwuwa, Steven M. 882
 Klei, Thomas R. 427, 517
 Klein, Sabra L. **313**
 Kleinschmidt, Immo **34, 475, 790**
 Kleshchenko, Yulyia Y. 924
 Klimov, Alexander I. 719, 802
 Klimpel, Gary 452
 Kline, Daniel L. 847, 1087
 Klion, Amy D. 128, 129, **787, 789, 1232**
 Klotz, Stephen A. 60
 Klungthong, Chonticha 125
 Knapp, Elisabeth **356**
 Knols, Bart G. 247
 Knox, Tessa B. **1091**
 Knue, Gregory 251
 Ko, Albert I. 68
 Kobashigawa, Andres 468
 Kobayashi, Kyousuke 412
 Kobayashi, Tamaki 208
 Kobylinski, Kevin C. **769, 1065**
 Kochel, Tadeusz J. 269, 272, 312, 316, 487, 709, 719, 890, 1091, 1099, 1100, 1101, 1128, 1129
 Koech, Davy 785, 1233
 Kohl, Vohith 997
 Koirala, Janak 66
 Koita, Ousmane A. **1004, 1027, 1182**
 Kok, Gerdalize 373

- Kokoza, Vladimir 1199
 Kokwaro, Gilbert 172
 Kolaczinski, Jan 377
 Kolappan, C 381
 Koles, Nancy 544
 Kolevic, Lenka A. 825
 Kolody, Brianna **657**
 Komar, Nicholas 261, **808**
 Komba, E. 438
 Kombila, Maryvonne 1190
 Komblo, Ibrahim 528
 Kome, Nelson E. S. **142**
 Konaté, Amadou T. 1017, 1031, 1041
 Konate, Siaka 128, 129, 787, 789, 1232
 Kone, Abdoulaye K. 25, 1036
 Kone, Mamady 1005
 Kone, Nouhoum 797
 Kone, Younoussou 220, 325, 620, 622, 987
 Kongjaroon, Suchada 418
 Kongoro, Jedidah 937
 Kongsin, Sukhontha 113, 491
 Konishi, Tamiko 353
 Konovalova, Svetlana 5, 6
 Konradsen, Flemming 226
 Koram, Kwadwo 223
 Koram, Kojo 876
 Korir, Jackson C. **338**
 Koroma, Joseph B. **135**
 Kortepeter, Mark 646
 Koru, Ozgur 541, 543, **826**
 Kosasih, Herman 13, 896, **897**, 1109
 Koscalova, Alena 966
 Kosoy, Michael Y. **265**, **416**
 Kosoy, Olga 500, 512, **904**
 Kossou, Hortense 1191
 Koster, Frederick 1107
 Kotaki, Akira 8
 Kotecka, Barbara M. 450
 Kotloff, Karen 369, 797
 Kotova, Svetlana 3
 Kou, Zhihua 11, **44**
 Kouriba, Bourema 25, 1036
 Kozar, Michael P. 589, 978, 979, 980
 Kozikowski, Alan 970
 Kraemer, Susan M. **940**
 Kramer, Laura D. 806, 1086
 Kramer, Martin L. 523, 582, **588**
 Kramer, Wayne 509
 Krasavin, Nina M. **665**
 Krastins, Brian 414
 Krause, Michael A. 220
 Krcmery, Vladimir **156**
 Krebs, John 268
 Kreamsner, Peter G. 191, 199, 1190
 Kristanto, I. 708
 Krogstad, Donald J. 580, 592, 631, 761, 1004, 1027, 1182
 Krogstad, Frances M. 580
 Krudsood, Srivicha 873, 1184
 Krueger, Laura 480
 Krzych, Urszula 646, 647
 Kuan, Guillermina 47, 126, 388, 705
 Kubaje, Adazu 299
 Kuboja, S. 27
 Kucerova, Zuzana 917
 Kudzala, Amose C. 16
 Kuikumbi, Florent M. 542
 Kuile, Feiko T. 1013
 Kuklinski, Jaime 738
 Kulesh, David A. 314
 Kulkarni, Prasad 264, 883
 Kumar, Abhay 19
 Kumar, Arvind 540
 Kumar, Nirbhay 208, 342, 762, 940
 Kumar, Pavan 381
 Kumar, Sanjai 811
 Kumar, Sanjeev 1070
 Kumaraswami, V 381
 Kumbak, D. 1117
 Kun, Juergen J. F. 191
 Kunz, Susan 657
 Kurane, Ichiro 8
 Kurkela, Satu **317**
 Kurtis, Jonathan D. 331
 Kurtz, Jonathan R. **60**
 Kuser, Paula Regina 225
 Kusuma, Andreas 935
 Kuzera, Kristopher 49
 Kuzmin, Ivan V. 265
 Kweka, Eliningaya J. **246**
 Kwiatkowski, Dominic 773
 Ky, Clotilde 605, 606, 619
 Kyabayinze, Daniel J. 177, **884**
 Kyelem, Dominique 528, **1112**, 1154
 Kyle, Dennis E. 192, 450, 540, **547**, 600, 973, 1121, 1122
 Kyle, Jennifer L. 45
- L**
- La Corte dos Santos, Roseli 951
 Laakkonen, Juha 317
 LaBeaud, A. Desiree 785, **1132**
 Lacerda, Hênio G. 421
 Lackner, Peter 1190
 Lacma, Julio 1088
 Ladipo, Olaniran 152
 Ladislau, José L. B. 951
 Lafferty, Erin I. 1184
 LaFlamme, Anne Camille 742
 LaForce, Marc 264, 883
 LaFuente, Carlos 1201
 Lagneau, Christophe 1221
 Laguna, Alberto 312, 709, 798, 1099, 1101
 Laha, Thewarach 290
 Lahiri, Pulak **553**
 Lamb, Erika 303
 Lambert, Lynn 4, 22, 645
 Lamberton, Poppy H. L. **752**
 Lambrechts, Louis **682**
 Lameyre, Valérie 77
 Lammey, Jovitha 1195
 Lammie, Patrick J. 141, 432, 1112, 1114, 1154
 Lampah, Daniel 796, 935, 1183, 1194
 Lampman, Richard L. **505**
 Lan, Nguyen T. P. **12**, 893
 Lanar, David E. 25, 646, 1036
 Lanata, Claudio F. 366, 367
 Lanciotti, Robert S. 512, 904
 Landa, Veronica 320
 Lander, Eric S. 406, 1211
 Landis, Sarah 1000
 Laney, Sandra J. 141, 1115, 1154
 Lanfrancotti, Alessandra 737
 Lang, Jean 386
 Lang, T. 26
 Langenbach, Kurt J. 479
 Lanier, Lewis L. 336
 Lanteri, Charlotte 979
 Lanzaro, Gregory C. 50, 241
 Laowatanathaworn, Paiwan 418
 Lapid, Bruno 233
 Laquer, Kari M. 643
 Lara, Ana M. 288
 Larocque, Regina C. 414, 415
 Larsen, David 794
 Larsen, Thomas 314
 Larson, David **144**, 786
 Lascano, Mauricio 417, 695
 Laserson, Kayla 100, 101, 102, 299, 368, 369, 370, 372, 615
 Laufer, Miriam K. **728**, 989
 Laurens, Matthew B. 25, 728, **1036**
 Laurent, Thierry 1202
 Laven, Janeen 904
 Laven, Janeen J. **512**
 Laverty, Caroline 1204
 Law, Irwin 1195
 Lawniczak, Mara 1078
 Lawrence, Emma 1229
 Lawrence, Jody 575
 Lawrence, Joanne 852
 Lawson, Bernard W. 253
 Lazarus, Wilfred 138
 Lazo, John S. 472
 Le, Hung X. 1051
 Le, Thuan K. 1051
 Le Doux, Diffo J. **531**
 Le Mire, Jacques 1219
 Leach, A. 26, 27, 1036
 Leake, John 196
 Leary, Kevin J. 182
 LeBlanc, Ralph E. **208**, **940**
 Lebowitz, Jack 3
 LeBreton, Matthew 531
 Lebrun, Lauren M. 414
 Leclipteux, Thierry 1202
 Ledezma, Eliades 552
 Lee, Nelson **959**
 Lee, Rogan 86
 Lee, Yoosook **50**
 Lee, Yeuk-Mui 440, 532, **864**
 Lefèvre, Gilbert 171, **568**, 569
 Lehmann, Tovi 748
 Lehnert, Nicola 199
 Leifsson, Pall S. 37
 Leimgruber, Stephanie 472
 Leistner, Christine 695
 Leite, Liliene 423
 Lejano, Jennylynn N. 1037
 Lek, Dysoley **295**
 Leke, Rose G. F. 327, 1015
 Lekule, Faustin 438
 Lell, Bertrand 199
 Lemma, Hailemariam **173**
 Lemnge, Martha M. 23, 26, 96, 155, 195, 328, 345, 601, 608, 641, 1012
 Leng, Lin 1231
 Lengeler, Christian 394, 396, 397, 573, 577, 585, 947
 Lenhart, Audrey **1220**
 Lennon, Niall 47
 Lennon, Niall J. 123
 Leon, Leonor L. 561, 920, 919
 Leon-Cabrera, Sonia 437
 Lerch, Melissa 1235
 Lerdthusnee, Kriangkrai 416
 Lertora, Juan J. L. 761
 Lescano, Andrés G. 109, 309, 320, 1088
 Leslie, Toby 54, **377**
 Lessa, Marcus 161
 Lessler, Justin 385
 Letson, Bill 899
 Leturia, Carlos 709
 Levashina, Elena 1069
 Levine, Myron M. 369, 797
 Levine, Richard A. 49
 Levio, Mantos 110
 Levy, Joshua 1130
 Levy, Karen **364**
 Levy, Michael Z. **767**
 Lewis, Drew 374
 Lewis, Sheri 710
 Li, Ang **1186**, 1210
 Li, Ben-Wen 427, **520**
 Li, Hua 558
 Li, Hongyi 1098
 Li, Julin 245
 Li, Jia **352**, 363
 Li, MingLin 1
 Li, Qigui 178, **182**, **183**, 184, 185, 186, 589, 970, 1207
 Li, Sheng 6
 Li, Shunyi 291, **292**
 Li, Tao 1
 Li, Xiaoming 322
 Li, Yuesheng 357
 Lia, José 240
 Liang, Alison 106
 Liang, Jennifer L. 1114
 Liang, Li-Ching 913
 Liang, YanMei 1151
 Liauw, Felix 1113

- Libraty, Daniel H. 120, **389**, 484, 891
- Liebman, Katherine 975
- Lievens, M. 26, 27, 28
- Liles, W. Conrad 322, 1184, 1187, 1198, 1214,
- Lillie, James 582
- Lim, Chae-Seung 968
- Lim, Chwee Teck 1186, 1210
- Lim, Jung-Dae 942
- Lim, Parath 599
- Lim, Tong Seng 1186
- Lim, Yvonne A. L. 276
- Lima, Aldo A. M. 107
- Lima, Iraci D. 421
- Lima, Maria F. 924
- Lima-Junior, Josué C. 999
- Limbach, Keith 5, 6, 7, 644, 1034, 1037
- Limban, Carmen 1145
- Limpitikul, Kriengsak 635
- Lin, Ai J. 589
- Lin, Min-Hau 492
- Lin, Ming 809
- Lindblade, Kimberly 98, 214, 463, 777, 1007, 1033
- Lindegardh, Niklas 575, 730
- Lindsay, Steven W. 259, 688, 735, 793
- Lindstrom, Stephen 719
- Linehan, Mary 464, 528
- Lines, Jo 997
- Linser, Paul J. **661**, 1139, 1171
- Linthicum, Kenneth J. 1058
- Lira-Zumbardo, Victor 732
- Lisakuluk, Sunisa 114
- Liskova, Anna 156
- Listyaningsih, Erlin 105, 716
- Littrell, Megan 794
- Liu, Chung-Ming 482
- Liu, Hanlan 190, 582
- Liu, Huayin 580
- Liu, Hwei-Chung 913
- Liu, Jun 322
- Liu, Mingshun 14
- Liu, Qingzhen 1133
- Liu, Rui Q. 403
- Liu, Shifan 294
- Liu, Tsan-Hsiun 913
- Liu, Yaobao 245
- Livengood, Jill A. **493**, 892
- Liyana, Tilaka 433
- Llanos, Joseph K. 700
- Llanos-Cuentas, Alejandro 858, 1202
- Loaiza, Jose R. **680**
- Lobo, Neil F. 679
- Locke, Emily 5, 6
- Loftin, Karin 717
- Logue, Christopher H. **311**
- Loke, P'ng 159
- Lokomba, Victor 1000
- Lolis, Elias 1231
- Lomo, Dr. Peter 81
- Londono, Berlin L. **592**, **631**
- Londono-Navas, Angela 1161
- Long, Carole A. 4, 5, 6, 22, 620, 642, 645, 652, 1034, 1039
- Long, Earl 456
- Long, Kanya C. **316**
- Long, Maureen 506
- Looareesuwan, Sornchai 633, 873
- Lopansri, Bert 1194
- Lopez, Beatriz 98
- Lopez, Carmen 1128
- Lopez, Gerard 463
- Lopez, Martha 109
- Lopez Sifuentes, Victor 766
- Lopez-Martinez, Giancarlo 750
- Lord, Cynthia C. 749
- Loroño-Pino, Maria A. 732, 809
- Lothrop, Branka B. 1058
- Loughlin, Anita M. 868
- Louis, Penali K. 595
- Loukas, Alex 290
- Lourido, Sebastian 1239
- Lovato, Raquel 140
- Lovegrove, Fiona E. **1184**
- Loyevsky, Mark 1
- Lozano, Leyder Elena 454, 744
- Lozano, Sonia 971
- Lozano-Fuentes, Saul 732, 771, **1066**, **1067**
- Lu, Da-bing 329
- Lu, Feng 245, 968
- Lu, Ziyue 1198
- Lubaki, Jean-Pierre F. 542
- Lubega, George 356
- Luby, Stephen P. 17, **20**, 263, 319, 712, 715, 1131, 1222
- Lucas, Carmen M. 197, 563, 632, 1014
- Lucas, John R. **1218**
- Lucchi, Naomi W. 341, **392**, 1013
- Lucena, Marize C. 951
- Luchavez, Jennifer 966
- Luckhart, Shirley 686, 698, 1077
- Lugemwa, Myers 816, 1125
- Lugo de Yarbuh, Ana 165, 166, 533
- Lukas, Susan 1122
- Luke, Lisol N. 703
- Lukens, Amanda K. **1211**
- Lum, Emmaculate 193
- Lum, Lucy C. 113, 491
- Luna, Giuseppe 1204
- Lungi, Victor 1130
- Luong Chan, Quang 391
- Lushino, P 993
- Lusingu, John P. 23, 26, 328, 345, 601, 641, 1012
- Luxemburger, Christine 391
- Luy, Betty E. 493, 507, 511, 892
- Lwin, Myo M. 966
- Lyashchenko, Konstantin P. 68
- Lydy, Shari L. **417**
- Lyimo, Issa 247
- Lyimo, John 568, 571
- Lyke, Kirsten E. 25, 1036
- Lynch, Caroline **348**
- Lynch, Julia A. 700
- Lynch, Michelle M. 1042
- Lyons, Jeffrey 647

M

- M, Oduola A. 949
- Ma, Wu 939
- Mabey, David C. 1225
- Mabuza, Aaron 373
- Macaluso, Kevin R. 783
- Macareo, Louis **178**
- MacDonald, Nick 3
- Macedo de Oliveira, Alexandre 71
- Machado, Paulo L. 355, 1203
- Machado, Paula R. 116
- Machado-Silva, Jose R. 436
- Macharia, Stephen 542
- Machel, F. 27
- Machevo, Sonia 571
- Machorro, Garcia 888
- Maciel, Bruna L. L. **421**
- Macintyre, Kate 794
- Mack, Brian 592
- Mackenstedt, Ute 404
- Mackenzie, Charles 138, 139, **140**, 384, 525, **875**, 1116, **1160**
- Mackenzie, Charles D.
- MacLean, J. Dick 1227
- MacLennan, Calman A. 340
- Madarieta, Susana 115
- Madebe, Rashid 608
- Madison, Marisa N. **924**
- Madrid, Cesar 1099
- Madureira, Ana Paula 225
- Mady, Ndiaye 832, 912
- Maes, Gregory E. 296
- Maes, Louis 1205
- Maestre, Amanda 593
- Magak, Gideon N. 1019
- Magalhães, Andrea 161
- Magalhães, Izanelda 951
- Magalhaes, Tereza **654**, 770
- Magill, Alan 188, 189, 472, 581, 589, 1207
- Magistrado, Pamela A. 601, **641**
- Magnussen, Pascal 438, 820
- Mahamadou, Ibrah 1004
- Mahande, Aneth M. 246
- Mahande, Johnson M. 246
- Mahanty, Siddhartha 22, 36, 420, 787, 789, 1232
- Mahapatra, Lily 379
- Maharaj, Raj 475
- Mahdy, Mohammed 276, 1179
- Maher, Steven P. 776, **931**
- Mahesh, Nira 772
- Maia, Dilson C. 919
- Maiga, Deo 195
- Maiga, Hamma 571, **727**, 950, 987
- Maiolatesi, Santina 7
- Maire, Nicolas 219
- Maiteki-Sebuguzi, Catherine 818
- Majambere, Silas 259, **688**, 793
- Major, Joshua W. 583
- Majori, Giancarlo 206
- Makame, Hamad 571
- Makemba, Ahmed 573
- Makene, Christina L. 139, 525
- Makin, Jenny 827
- Makprasert, Sirirat 702
- Malafaia, Emilia C. O. B. 902, 903
- Malaga, Fernando 767
- Maliquias, Luiz Cosme C. 303
- Maldarelli, Grace 382
- Maldonado, Fernando 109
- Malecela, Ezekiel K. 195, 608
- Malecela, Mwele 138, 139, 525, 875, 1116
- Malhotra, Indu 625, 651, 785, **1233**
- Malila, Aggrey 585
- Malimi, Masunga C. 1012
- Malkin, Elissa 22, 646, 969, 1039
- Mallory, Rayburn 62
- Maloney, Jenny G. **551**
- Maloney, Susan A. 416, 418
- Mamani, Enrique **118**, 485, 906, 914
- Mammen, Ansu 1151
- Mammen Jr, Mammen P. 891
- Manalastas, Emily 1178
- Manamperi, Aresha 1032
- Mancini, Emiliano 1069, 1168
- Mancuso, Jamie 711
- Mand, Sabine 383
- Mandala, Wilson L. **340**
- Mandava, Nageswara 707
- Mandel, Eric 268
- Mandike, Renata 195
- Manfred, Weidmann 912
- Mangeni, Fred W. 177, 1125
- Manivannan (Uradey), Bhagyashree **742**
- Mann, Victoria H. 739
- Manni, Tytti 317
- Manning-Cela, Rebeca G. **562**
- Manohar, Nalini 1034, 1037
- Manque, Patricio A. 288
- Mansor, Sharif 1193
- Mantilla, William 1128
- Manyando, Christine **570**
- Maraga, Seri 819
- Marano, Nina 461
- Maraschiello, Ciriaco 590
- Marcel, Tanner 89, 236
- Marchant, Tanya J. **998**
- Marchena, Loyd 1107
- Marchesini Barbosa, Paola 951
- Marchetti, Elisa 264, 883
- Marcombe, Sebastien **232**, **1221**
- Margolius, David 331
- Mariani, Giuseppe 405, 443

- Marin, Dairo 687, 744
 Mariñas, Jamileth 1107
 Marinho, Claudio R. F. 629
 Marini, Francesca 693
 Marjason, Joanne 1039
 Marlenee, Nicole 511
 Maroli, Michele 693
 Marovich, Mary A. 10
 Marques, Isabel 227, 229
 Marquet, Pablo A. 713
 Márquez-Dueñas, Claudia 562
 Marquino, Wilmer 1026
 Marrast, Anne-Claire 171
 Marrs, Carl F. 413
 Marsh, Kevin 26, 617, 817
 Marshall, Jonathon C. 683
 Marshall, Stephanie A. 1037
 Martellet, Lionel 264
 Martelli, Celina T. 113, 491
 Martin, Gregory J. 269
 Martin, Laura B. 4, 622, 623, 642, 645, 652, 1039
 Martin, Sam 799
 Martin, Shannon S. 720
 Martínez, Idali 886
 Martinez, Luis J. 700
 Martínez, María 590
 Martinez-Calvillo, Santiago 164, 556, 562
 Martinez-Flisser, Gina 39
 Martinez-Gutierrez, Marlen 497, 498
 Martinez-Medina, Dalila 858
 Martins-Filho, Olindo A. 902, 903
 Martinson, Jeremy 640, 1022, 1230
 Maruli, A. 708
 Marx, Preston 566
 Mary Lynn, Baniecki 579
 Masokoto, A. 993
 Mason, Carl J. 267, 270, 801
 Mason, Peter W. 55, 111, 499, 807
 Massougbody, Achille 210, 567, 1191
 Masuku, Humphreys 16
 Masur, Henry 1182
 Mateus, Cristian E. 943
 Mather, Michael W. 1030
 Mathew, Anuja 889
 Mathingau, Alice 100, 101, 102, 368, 370
 Mathison, Blaine A. 456
 Matos, Eduardo 914
 Matthias, Frank 199
 Matuja, W. 438
 Matute, Juan Carlos 126
 Mave, Vidya 761
 Maves, Ryan C. 269, 487
 Mawlouth, Diallo 832
 Max, Grogl 1207
 May, Balam 887
 May, William 1066
 Mayan, Ismail 377
 Mayanja-Kizza, Harriet 73
 Mayence, Annie 557
 Mayengue, Pembe 199
 Mayer, Gunter 515
 Mayhew, George F. 428, 519
 Mayor, Yovanna E. 825
 Mayta, Egma 906
 Mayumana, Iddy 396, 573
 Mayxay, Mayfong 633, 1123
 Mazitschek, Ralph 190, 578
 Mazumder, Lakshman 557
 Mazure, Hubert 76, 92
 Mazzudulli, Gina M. 923
 Mbanya, Dora 962
 Mbaye, Aïcha 967
 Mbidde, Edward 419
 Mbogo, Charles M. 672
 Mboup, Soulyemane 349, 406, 1211, 1212
 Mbuyita, Selemani 175, 982
 Mc Millan, David 581
 McAbee, Rory D. 50
 McArdle, James L. 716
 McAuliffe, Isabel T. 440, 532
 McBride, Alan 68
 McCaffrey, Anton 350
 McCall, Philip J. 778, 1220
 McCalmont, William 979
 McCarthy, James 703, 854, 959
 McCarthy, James S. 52
 McClellan, Holly 1047
 McClintock, Shannon K. 1114
 McCollum, Andrea M. 197, 198, 343, 408, 984
 McDermott, Colleen 519
 McElroy, Kate L. 123, 502
 McFarland, Deborah 335, 874
 McGarvey, Stephen T. 329, 1181
 McGee, Bryan 730
 McGee, Charles E. 513, 1111
 McGill, Alan J. 973
 McGowan, Stephen E. 421
 McGrath, Shannon 646, 1034, 1037
 McGugan, Glen 157
 McHenry, Amy M. 411, 639
 McKenzie, F. Ellis 617, 767, 817
 McKerrow, James 159, 162, 1205
 McKinney, Michelle D. 314
 McManus, Donald P. 357, 399, 403
 McMorrow, Meredith L. 72, 614, 956, 987
 McNamara, David T. 607
 McNulty, Samantha N. 429
 McQuiston, Jennifer 268
 McVey, Duncan 6, 644
 Mduluzza, Takafira 342
 Mead, Daniel G. 478, 810
 Mead, Paul S. 419
 Means, John 1134
 Mease, Ryan M. 643
 Meckel, Jason 769, 1065
 Medeiros, Daniele B. A. 723
 Medeiros, Marco A. 68
 Medica, Darcy L. 508
 Medina, Anicia M. 825
 Mediratta, Rishi P. 97
 Medlock, Jan 697
 Meek, Sylvia 997
 Megnekou, Rosette 627
 Mehlhop, Erin 804
 Mehus, Joseph O. 696
 Meira, Glenda C. 902
 Mejia, Lidia 704
 Mejia-Zuluaga, Lida 878
 Melendez, Victor 182, 185, 555, 760, 970, 978, 979, 980
 Melgar, Sergio 59
 Melman, Arnold 565
 Melo, Paulo R. S. 673, 751
 Melrose, Wayne 92, 132
 Membi, C. 27
 Menan, Kouame G. 595
 Mende, Katrin 266, 275
 Mendelsohn, Laurel 1182
 Mendez, Antonio 552
 Mendez, Fabian 469
 Mendez, Juan 555, 925, 1207
 Mendez, Yolanda 465
 Mendlovic, Fela 437
 Mendoza-Silveiras, Jose 7, 1034
 Menegon, Michela 206
 Meneses, Claudio R. 50
 Menezes, Collin N. 400
 Menezes, Eliane P. 161
 Menezes, Gisele B. L. 901, 902, 903
 Menge, David M. 1213
 Menocal Heredia, Lenina 1150
 Menon, Manoj 16, 99
 Menten, Joris 567, 823, 1150
 Meola, Mark A. 806
 Mercado, Edel 389
 Mercado, Erik H. 103
 Mercado, Xiomara 886
 Mercer, Luke 538, 1205
 Mercier, Thomas 170
 Meredith, Stefanie 130
 Meremikwu, Martin M. 618
 Merino, Nancy 914
 Merrill, Denise 479
 Mertens, Eva 805
 Mertz, Gregory J. 713, 1103, 1127
 Mesa, Ana María 981
 Meshnick, Steven R. 75, 539, 611, 613, 1000, 1119
 Messele, Ayenew 1003
 Messina, Jane 1098
 Mestres-Simon, Montserrat 737
 Mesu, Victor K. 542
 Metenou, Simon 787, 789, 1015, 1232
 Meteyer, Carol 1161
 Metta, Emmy 175
 Meya, David 73
 Meyer, Esmeralda V. S. 999
 Meylan, Françoise 379
 Meza, Rina 109
 Meza, Yocelinda 109
 Meza Gómez-Palacio, Isaura 895
 Mharakurwa, Sungano 305, 393, 986, 988
 Michael, Edwin 137, 139, 525
 Michael, Obaro S. 79, 398
 Michael, Scott F. 907
 Michaels, Sarah R. 255, 509, 510, 1083
 Michalski, Michelle 519, 521, 522
 Michelet, Lorraine 42
 Michon, Pascal 633
 Midega, Janet T. 672
 Midzi, Nicholas 342
 Miesfeld, Roger L. 656, 657, 658, 1136
 Mihigo, Jules 71
 Milazzo, Mary Louise 1126
 Miles, Aaron P. 22
 Miles, Michael A. 51
 Milhous, Wilbur K. 176, 192, 973
 Miliani, Efrain 465
 Militello, Kevin T. 775
 Milkreit, Maïke 483
 Miller, Ann K. 179
 Miller, Becky 1123
 Miller, David A. 858
 Miller, John 35, 216
 Miller, Lori 647
 Miller, Louis H. 3, 4, 22, 24, 220, 620, 621, 622, 623, 642, 645, 652, 1005, 1038, 1039, 1047
 Miller, R. S. 182, 763
 Miller, Scott 178
 Milligan, Paul 726, 735
 Millogo, Athanase 40, 41
 Milner, Erin 979
 Milner, Jr., Danny A. 406, 772, 1211
 Minakawa, Noboru 699
 Minakawa, N. 1056
 Minh Dung, Nguyen 1224
 Minja, Daniel T. 23, 1012
 Minnick, Sharon 890
 Mintwo, Alaine F. 542
 Mintz, Eric 98, 369
 Miranda, Aracelis 1028
 Miranda, María Consuelo 454
 Miranda-Choque, Edwin 879
 Miranda-Verástegui, César 858, 1202
 Miraval, Maria 914
 Mircetic, Marko 325, 622, 623
 Miri, Emmanuel 335, 1117, 1157
 Mis-Avila, Pedro 1066
 Misago, Seth 23, 608
 Mishra, Arunima 938
 Mishra, Prasun 80
 Mispireta, Monica 367
 Misty, Carlson 1207
 Mitre, Edward 144, 378, 786
 Mitreva, Makedonka 429, 520
 Miura, Kazutoyo 4, 22, 24, 620, 642, 645, 652, 1039

- Mixson-Hayden, Tonya 392, **984**
 Mkandawire, Rhoda 570
 Mkulama, Mtawa A. P. 393
 Mladonicky, Janice 432, 1114
 Mlambo, Godfree 342, 940
 Mlangwa, J. E. D. 38, 438
 Mlozi, M. R. S. 38, 438
 Mmbando, Bruno P. 155, 328, 345, 601, **608**
 Moafo, Jonas 384
 Moch, J. Kathleen 839
 Moerman, Filip 829
 Mogollón, Nora 165, 166
 Moguel, Barbara 59
 Mohammed, Hamish 488
 Mohammed, Nasir 377
 Mohandas, Narla 812
 Moharana, Surya Kant 18
 Moji, Kazuhiko 525
 Molaei, Goudarz 697
 Molgo, Jordi 233
 Molina, Sandra 1225
 Molina-Cruz, Alvaro 691, 1070, **1170**
 Moloney, James P. 1055
 Molyneaux, John W. 17, 263
 Molyneux, Malcolm E. 340, 772
 Mombo Ngoma, Ghyslain 199
 Moncayo, Abelardo C. 478, 551, **810**
 Mondal, Dinesh 277
 Mondal, Utpal K. 712, 1222
 Monintja, Juan 935
 Monroy, Carlota 59
 Montano, Silvia M. 1099, 1102, 1129
 Monteiro, Glória R. 421
 Monteiro, Hamilton A. O. 721
 Monteville, Marshall 1166
 Montgomery, Jacqui 772
 Montgomery, Joel M. 272, 309, 312, 316, 320, 709, 719
 Montgomery, Philip 406, 1211
 Montgomery, Susan P. 297, 299, **332, 333**
 Montip, Gettayacamin 589
 Montoya, Jose G. 1142
 Montoya, Romeo 113, 491
 Moon, Steven J. 314
 Moore, Christopher **73**
 Moore, Chester G. 771, 833
 Moore, Julie M. 1187, 1188
 Moore, Sarah J. 247
 Moormann, Ann 326, 651
 Moormann, Ann M. 1020
 Mor, Siobhan M. **1141**
 Morales, Maria Eugenia 261
 Morales, Maria 301, 739
 Morales, Rossana 555
 Morales-Betoulle, Maria Eugenia 808
 Moran, Diego 374
 Moran, Thomas M. 43
 Morazzani, Elaine M. **1162, 1163**
 Morenikeji, Olajumoke A. 624
 Moreno, Alberto **650, 999**
 Moreno, Elio A. **165, 166, 533**
 Moreno, Elizabeth C. 303
 Mores, Christopher N. 1090
 Moretz, Samuel E. 5, 652
 Morgan, John 1215
 Morgan, Marjorie **854**
 Morgan, Oliver **800**
 Morgan, Timothy W. 783
 Morita, Kouichi 12, 893
 Morlais, Isabelle 1079
 Morris, Natasha 475, 771
 Morris, Shaun K. **262**
 Morrissey, Joanne M. 1030
 Morrison, Amy C. 272, 316, 890, 894, 1089, 1091
 Morrison, Dennis N. 386
 Morrone, Aldo 173
 Moses, Lina M. **1130**
 Mosha, Frank W. 96
 Mosha, Jacklin F. 96
 Mosher, Aryc W. 35, 216, **527, 1003**
 Moss, Kelley J. 493, 892
 Moudy, Robin M. **806**
 Mouline, Karine 1075
 Mounsey, Kate E. **52**
 Moura, Iaci 1143
 Moya, Roni 227
 Moyou Somo, Roger 531
 Mpanga Sebuyira, Lydia 395
 Mpimbaza, Arthur **93, 1189**
 Mponda, Hadji 998
 Mpoto, Alfred M. 542
 Msangeni, Hamis H. 608
 Msham, Salum 23
 Msham, S. 26
 Mshana, Christopher 573
 Mshinda, H. 27
 Mshinda, Hassan 247, 396, 573
 Mtsiwa, Deo 394, 397, 577
 Mtullu, Samuel 155
 Muchiri, Eric 299, 300, 359, 785, 996, 1233
 Mueke, Jones M. 689, 690
 Mueller, Ellen C. **145**
 Mueller, Ivo 703, 819, 1195
 Mueller, Natascha 977
 Muerhoff, Scott 961, 962, **963**
 Muh, Bernice F. 193
 Muhire Manzi, Remy Serge **870**
 Mukama, Bateganya F. H. **83**
 Mukherjee, Shankar 558
 Mukherjee, Sudeshna 810
 Mukhri, Haditya L. 1109
 Mukwamataba, Doreen 823, 829
 Mulenga, Modest 323, 823, 829
 Mulet, Teresa 586, 587
 Mullen, Gregory E. 623, 642, 652, 1039
 Müller, Joachim 286, 1145
 Mulumba, Madishala P. 243
 Mulure, Nathan 172, 173, 571, 585, 947
 Muluvi, Geoffrey M. 1033
 Munasinghe, Anusha 634
 Mundaca, Cecilia C. 709
 Mungai, Peter 625, 651, 785, 996, 1233
 Munguti, Kaendi 174
 Muniz, Andre Luiz 784
 Muñoz, Carlos 1107
 Muñoz, Fredy **463**
 Muñoz-Jordán, Jorge 43, 123, 502
 Munstermann, Leonard 469, 687, 744
 Munungi, Auguy K. 542
 Munungu, Blaise F. 542
 Muok, Erick M. O. 297, 299, 332, 788
 Muratova, Olga 22, 1043
 Murray, Clinton K. **266, 269, 275**
 Murray, Meredith R. 495
 Murray, Sara A. **4**
 Musapa, Mulenga 252
 Muskavitch, Marc **1078**
 Musoke, Charles 1189
 Mutabingwa, Theonest K. 743, 1124
 Mutale, Felix 823
 Mutalemwa, Prince 525
 Mutambu, Susan L. 342
 Mutangala, Willy 424
 Mutantu, Pierre N. 542
 Muth, Sinuon 599
 Mutombo, Wilfried 424
 Mutuku, Francis **689, 690**
 Mutunga, James M. **1216**
 Muturi, Ephantus J. **248**
 Muvdi, Sandra 545
 Mwai, Leah 991
 Mwakalinga, Steve 993
 Mwakalinga, Steven B. 641
 Mwakilembe, P. 438
 Mwakingwe, Agnes **928**
 Mwakitalu, Mbutolwe E. **138, 139, 875**
 Mwangi, Jonathan **407**
 Mwangi, Rose W. **70**
 Mwangi, Tabitha 817
 Mwanje, Mariam 299
 Mwapasa, Victor 75
 Mwatha, Joseph K. 300
 Mwebaza, Norah **84, 576**
 Mwesigwa, Julia **730**
 Mwingira, Upendo J. **139, 525**
 Mwinzi, Pauline N. 297, **299, 302, 330, 332, 333, 358, 362, 788**
 Mwita, Alex 195
 Myer, James 189
 Myers, Timothy G. 143, 1153
 Myint, Hla Y. **188**
 Myles, Kevin M. 321, 1162, **1163**
 Myllynen, Johanna 317
 Myombo, Mtango 525
 Myrick, Alissa 336
 Mzayek, Fawaz **761, 1182**
- Mzilahowa, Themba **1094**
- ## N
- Na-Bangchang, Kesara 593
 Nabakooza, Jane 395
 Nagarkatti, Rana **811**
 Nagpal, Avinash C. 984
 Nagy, Tamas 1188
 Naha Biswas, Sejuti 553
 Nahar, Nazmun **712, 715, 1131, 1222**
 Nahlen, Bernard L. 214, 1033
 Nahum, Alain 567, 571
 Naik, Kinnery 100, 101, 102, 368, **370**
 Nair, Shalini 200, **1123**
 Najera-Vazquez, Rosario 732
 Nakavet, Agat 1119
 Nakayaga, Joan 730
 Nakiboneka-Ssenabulya, Deborah 1189
 Namayanja, Monica 356
 Nambozi, Michael 829
 Namountougou, Moussa **1060**
 Namwanje, Harriet 464
 Nana-Djeunga, Hugues 1156
 Nanayakkara, Dhammika 857
 Nandy, Anindita 87, 88
 Nankabirwa, Joaniter I. **725**
 Nantezza, Ann 356
 Naorat, Sathapana 418, 702
 Napuli, Alberto J. 977
 Naquira, Cesar 1201
 Naranjo, Nelson 1077
 Nare, Bakela 162, 537, **538, 1205**
 Narro-Robles, Jose 39
 Narum, David L. 3, 22, **839, 1038**
 Nascimento, Eliana T. 421
 Nascimento, Marcia 355
 Nascimento, Rute 227
 Nash, Oyekanmi 398
 Nash, Theodore E. 36, 420
 Nataro, James P. 104
 Nathan, Rose 396, 998
 Nau, Martin 1122
 Naumova, Elena N. 1141
 Navaratnam, Viswerwaran 873, 1193
 Navarro, E 1103, 1127
 Navas, Adriana **915**
 Nawaz, Fatima 598
 Nayiga, Susan 576
 Ndanu, Ann M. 1033
 Ndao, Momar 483, 1227
 Ndassa, Arouna 531
 Nde, Pius N. 924
 Ndege, Henry **1022, 1230**
 Ndenga, Bryson 259
 Ndiaye, Daouda 349, 406, 967, 1211, 1212
 Ndiaye, Jean L. A. 967
 Ndiaye, Mady 1106
 Ndir, Omar 349, 1211, 1212

- Ndirango, James 803
 Ndjamen, Blaise **354**
 Ndjemai, Hamadou N. M. **237**
 Ndububa, Dennis A. 584
 Ndubuisi, Mackevin 279
 Ndumbe, Peter M. 204
 Ndyomugenyi, Richard 820
 Neafsey, Daniel E. 406, 1078, 1211
 Neal, Aaron 1045
 Nébié, Issa 1017, 1031, 1041
 Neira Oviedo, Marco V. 661, **1139**
 Nelson, Kara 364
 Nelson, Randin C. **504**
 Nelson, Steevenson **804**
 Nemeth, Nicole 500
 Nemmers, Suzie T. 69
 Neres, Rita 227, **629**
 Nery, Susana 1052
 Nett, Randall 1140
 Neves, Luis 438
 Newman, Patrick C. 318
 Newman, Robert 71, 72, 987
 Newman, Stanton 1192
 Newsome, Anthony 551
 Newton, Charles R. 1190
 Newton, Je T'Aime 717
 Newton, Paul 1123
 Neyra, Joan M. 709
 Neyra, Victor **649**
 Ng'ang'a, Zopporah W. 788
 Ng'habi, Kija R. 247
 Ngalle, Elive 384
 Ngamije, Daniel **791**
 Ngo, Thang D. **1051**
 Ngondi, Jeremiah 35, 1003
 Ngouama, Daniel 424
 Ngouamegne, Erasmiene T. **187**
 Ngouela, Silvere 187
 Ngoundou-Landji, Josiane 624
 Ngowi, Helena A. **38**, 438
 Ngu, Vu T. T. 12, 893
 Nguyen, Cokey 578
 Nguyen, Trong Toan 391
 Nguyen, Tien 537
 Nguyen, Vu 3, 1038
 Nguyen Thi, Kim Tien 391
 Ngwa, Alfred A. 930, **933**
 Niambale, Mohamed B. 24
 Nian, Hong 298
 Niangaly, Amadou 25, 1036
 Nielsen, Morten A. 641
 Nielsen, Robin 646
 Nieto, Monica 1129
 Nieves, Elsa **240**
 Niezgodá, Michael 265
 Nikolajczyk, Barbara 1151
 Nimmannitya, Suchitra 484
 Nimmo, Derric 1068
 Nin, Daniel A. 583
 Nisalak, Ananda 120, 147, 484, 891
 Nitiema, Pascal 40, 41
 Njama-Meya, Denise 818
 Njenga, Sammy M. 1112
 Njepuome, Ngozi A. 1117, 1157
 Njiokou, Flobert 531, 1156
 Njuguna, P. 26
 Njunge, James M. 1033
 Njunju, Eric 570
 Nkhoma, Ella T. **75**
 Nkuo-Akenji, Theresa 149, 193
 Nkya, Watoky M. 195
 Nneji, Chiaka 948
 Noble, Agustina 943
 Nobre, Mauricio L. 872
 Nobrega, Aglaer 423
 Noe, Robert A. 537
 Nofchissey, Robert 504, 910
 Noh, John C. **440**, 532, **864**
 Nojima, Toshi 1097
 Noland, Gregory S. **1019**
 Nolder, Debbie 954
 Nombella, Nohelly 1223
 Nonato, Walker 355
 Noonsate, Kittisak 418
 Noor, Abdisalan 617
 Noor, Ramadhan 23
 Noordin, Rahmah 1113
 Noormahomed, Emilia 438
 Noriega, L. M. 1103, 1127
 Noronha, Elza 161
 Norris, Douglas E. 252, 694
 Norris, Laura C. **694**
 Norton, Alice J. 308, 752
 Nosten, Francois 200, 966, 1123
 Nota, Anong D. **626**
 Novak, Robert 1080, 1081
 Novelli, Jacopo 516, 518
 Novick, Richard 928
 Noviyanti, Rintis **935**
 Novriani, Harli 897
 Noyes, H.A. 549
 Nsagha, Dickson S. **612**
 Nsobya, Samuel L. 591, 598
 Ntoburi, Stephen 458
 Ntoko, Mesame 193
 Ntonifor, Nelson N. 193
 Ntoumi, Francine 199
 Ntumngia, Francis B. **639**, 628
 Nuchprayoon, Surang 526
 Nugud, Abdel Hameed D. Mohamad Nugud 1095
 Nukui, Yoko **8**
 Nundy, Shantanu 282
 Nunes, Ashlee A. K. 740
 Nunes, Keley N. B. 723
 Nunes, Márcio R. T. 315, 721, 723
 Nunes Neto, Joaquim P. 315, 721
 Nuñez, Andrea 126, 388
 Nuorti, Juha Pekka 317
 Nuortti, Marja 568
 Nurhayati **896**
 Nursamsy, Nugradzia 935
 Nutman, Thomas B. 128, 129, 143, 379, 381, 382, 787, 789, 1153, 1232
 Nwaiwu, Obiyo 172, 571
 Nwakanama, Davis 1016, 1168
 Nwizu, Chidi **881**
 Nwoke, Betram E. B. 67, 451
 Nwuba, Roseangela I. 624
 NY, Lars 558
 Nyamongo, Isaac 438
 Nygren, Benjamin 17, 263
 Nyigo, Vitus 139
 Nyirenda, Oswald 728
 Nyitegeka, François 791
 Nyunt, Myaing M. **94**, **762**
 Nzarubara, Bridget 818
- O**
- O, Gbotosho G. 949
 O'Brien, Meg E. 205
 O'Connell, Amy E. 1152
 O'Meara, Wendy P. **617**, **817**
 O'Neil, Michael 176, 184, 472, 589
 O'Reilly, Ciara E. 369
 O'Reily, Michael 110
 Obaldia III, Nicanor 192, **450**, 970, 979
 Oberhelman, Richard **798**
 Oberholzer, R 27
 Obernauer, P.j. 847
 Obonyo, Charles O. **953**
 Obor, David 372, 615
 Obrist, Brigit 396, 573
 Obure, Alfredo 106
 Ocampo-D, Clara B. 469, 687, **744**
 Ochoa, Theresa J. 103, 366, 367, 704, 825, 878
 Ochong, Edwin **1029**
 Ockenhouse, Chris 7, 95, 643, 646, 647, 969, 1034
 Odaibo, Alex A. 624
 Odero, Christopher **72**
 Odhiambo, Frank 72
 Odidi, Beatrice 100, 101, 102, 368, 370
 Odiit, Amos 93
 Odoom, Shirley C. **74**
 Oduola, Ayoade M. J. 79, 597, 974
 Oduro, Abraham R. 876
 Offei Owusu, Irene 235
 Offianan, Toure A. **595**
 Ofori-Anyinam, Opokua 28, 646
 Ofulla, Ayub V. 1022
 Ofware, Peter 372, 615
 Ogah, G. 874
 Ogah, Gladys G. 1117, 1157
 Oguiche, Stephen 764
 Oguike, Chiaka M. **929**
 Ogutu, Bernhards 172, 763, 969, 983
 Ogwang, Sheila 372
 Ohrt, Colin 188, 189, 458, 581, 589, 758
 Ojaku, Alex 395
 Ojo, Kayode K. 977
 Ojurongbe, Daniel O. **191**
 Ojurongbe, Taiwo A. 191
 Ojwang-Ndong, Alice 172
 Okafor, Christian M. F. 624
 Okebe, Joseph 930, 1016
 Okedi, Loyce 53
 Okell, Lucy **31**, 795
 Okeola, Valeelat 948
 Okiror, Robert 395
 Okoko, Brown J. 264
 Okoroma, Christiana N. 455
 Okuda, Naoko 12
 Olack, Beatrice 803
 Oladoyinbo, Olatunde S. 153, 154
 Olaniyan, Omobola 174
 Oleinikov, Andrew V. **743**
 Oliveira, Bruna B. 107
 Oliveira, Fabiano **866**, 918
 Oliveira, Ieda F. 654
 Oliveira, Joyce 161
 Oliveira, Luis F. 921
 Oliveira-Ferreira, Joseli **999**
 Oliveras, Elizabeth 712, 715
 Olley, Benjamin O. 174
 Olliaro, Piero L. 470, 471, 731, 873, **952**, **1193**
 Olmeda, Raul 978, 979
 Olojede, Folake 398
 Olomi, Raimos 641
 Olotu, Ally **26**
 Olsen, Sonja J. 800
 Olson, Courtney 331
 Olson, Carol A. **542**
 Olson, Christine K. 100, 101, 102, **368**, 370
 Olson, Kenneth E. 122, 1085
 Olson, Sarah H. **685**
 Olszewski, Kellen 1237
 Olungah, C. O. 438
 Olutayo, Mojisola C. **453**
 Olveda, Remigio M. 331, 1181
 Olwoch, Peter 395
 Omer, Rihab A. **404**
 Omondi, Angela 983
 Omore, Richard 369
 Omosun, Yusuf 624
 Onapa, Ambrose 464
 Ong'echa, John M. 339, 371, 640, **936**, 937, 1022, 1230
 Ongoiba, Aissata 220, 325, 620, 621
 Ongugo, Paul O. 81
 Onischuk, Lisa 1140
 Onlamoon, Nattawat 46
 Onofre Arce, Gabriela C. 871
 Onwujekwe, Obinna **169**
 Onwuliri, Celestine O. E. 67, 451
 Onyeka, Preet I. K. **863**
 Ooko, Edna A. O. **81**
 Opoka, Robert O. 85, 337, 1184, 1213
 Opportune, Gomez G. 595

- Opreh, Philips 218
 Orago, Alloys S. S. 339
 Oramasionwu, Gloria E. **375**
 Orcutt, Andrew 22
 Ord, Rosalyn 72
 Orellana, Roberto 1129
 Orellana Rios, Wagner 766
 Oria, Prisca 368
 Oria, Reinaldo B. 107
 Oriero, Eniyou C. 1016
 Orimadegun, Adebola E. **153**, 154
 Orimba, Vincent 372
 Oringanje, Chioma M. **618**
 Orjuela-Sánchez, Pamela **211**, 604
 Oronsaye, Francis E. **90**, **909**
 Oronsaye, Praise I. Osazuwa 90
 Orr, Matthew D. **537**
 Ortega, C. 1103
 Ortega, Corrie 691, 1170
 Ortega, Oscar 126, 388, 705
 Ortega, Ynes 278
 Ortiz, Bernardino 555
 Osei Akoto, A. Y. 28
 Osei-Atweneboana, Mike Y. **1228**
 Osei-Kwakye, Kingsley 28, 473
 Osorio, Jorge E. 493, 497, **892**, **899**, 900, **1161**
 Ospina, Marta C. 497
 Ossai, Doris I. N. **909**
 Osters, Graciela R. **941**
 Otieno, Lucas **571**
 Otieno, Michael F. 339, 1230
 Otsuki, Hitoshi 840, 1043
 Otsyula, Moses G. 907
 Ott, Amy C. **1023**, **1042**
 Ottesen, Eric 528
 Ottesen, Eric A. 1112
 Otuonye, Ngozi M. **151**
 Ouari, Ali 1060
 Ouattara, Florence T. 605, 606, 821
 Ouedraogo, Andre Lin 1017
 Ouédraogo, Alphonse 1017, 1031, 1041
 Ouédraogo, Espérance 1017, 1031, 1041
 Ouédraogo, Jean-Bosco 306, 985, 1060, 1082, 1084
 Ouma, Collins 339, 371, 640, 936, 937, 1022, **1230**
 Ouma, John 785, 1233
 Ouma, Peter 571
 Oumar, Faye **832**, **911**, **912**
 Ousmane, Faye 832, 912
 Ovalle Bracho, Clemencia **545**
 Oviedo, Milagros 271, 465, 552
 Owaga, Chrispin 299
 Owen, Andrew 1029
 Owino, Simon O. 1187
 Owor, Nicholas 419
 Owusu, Ruth 28, 462, 473
 Owusu Boahen, K. 28, 473
 Owusu-Agyei, Seth **28**, 462, 473, 764, 995
 Owusu-Kwarteng, S. 28
 Oyama, Toshifumi 12
 Oyediji, Segun I. 191
 Oyibo, Wellington A. 191
 Oyofe, Buhari A. 1166
 Ozensoy Toz, Seray 543
 Ozkoc, Soykan 543
- P**
- Pa'au, Molisamoa 1114
 Pablo, Vial A. **1103**, **1127**
 Pabón, Adriana **981**
 Pachas, Paul 914, 1099
 Padilla, Norma 766
 Padilla-Mejia, Norma E. 164, **556**
 Padilla-Raygoza, Nicolas 860
 Page, Anne-Laure 966
 Page-Sharpe, Madhu 1195
 Pagnoni, Franco 174
 Paige Adams, A 318
 Painter, Heather J. 1030
 Palma, Eduardo R. 713
 Palomeque, Francisco S. 51
 Palsson, Katinka 1168
 Pamba, Allan 179, 584, 764
 Pancharoen, Chitsanu 147
 Pandharkar, Trupti 540
 Pando, Jackeline **704**
 Panella, Amanda J. 512, 904
 Panella, Nicholas 500, 808
 Paniu, Steven 1158
 Pankey, George A. **274**
 Panning, Markus 310
 Paonin, Surat 801
 Parapini, Silvia 976
 Paredes-Esquivel, Claudia C. **745**
 Parekh, Falgunee 7
 Parikh, Sunil **336**, **575**, 730, **822**
 Park, Bborie K. 1092
 Park, Daniel 406, 1078, 1211
 Park, Gregory S. **337**, 1019
 Park, Mahin 279
 Parker, Kenneth 414
 Parker, Michael D. 62, 720
 Parker, Tina 266
 Parmakelis, Aristeidis 683
 Parnsut, Krit 110
 Parquet, Veronique 972
 Parra, Beatriz 915
 Parriott, Sandi K. **290**
 Parsons, Michele 98
 Parulekar, Varsha 264, 883
 Parwati, Ida 896, 897
 Pasay, Cielo 52, 854
 Pascale, Juan M. 1107
 Pascoe, Steve 568
 Pascual, Mercedes 29
 Pastor, Jorge 320
 Pasvol, Geoffrey **1192**
 Pataca, Alexandra F. 71
 Patel, Jigar J. 990, 1123
 Patel, Vishal 349, 578, 582, 588, 775
 Patiño, Gladys 468
 Patocka, Nicholas **307**
 Pattanarangsang, Rattaporn 801
 Patterson, Noelle B. **5**, **6**, **7**, **644**, **1034**, **1037**
 Pattinson, Robert 827
 Patz, Jonathan A. 685
 Paul, Richard 121
 Paulson, Sally L. 1216
 Pavlin, Julie A. 801
 Paz Soldan, Valerie **894**
 Peacock, Erin 184
 Peacock, Sharon J. 68
 Pearce, Edward 355
 Pearce, Richard **344**
 Pearlman, Eric 380
 Pearson, Richard D. 421
 Peeters, Koen **619**
 Pei, Xinhong 812
 Peixoto, Vítor S. 721
 Penha-Gonçalves, Carlos 227, 229, 629
 Pannetier, Cédric 233, **1217**
 Penny, Melissa **219**
 Perales, Joe B. 537
 Peralta, Jose M. 279, **436**
 Peralta, Regina H. S. 279
 Perdrizet, George 813
 Pereira, Armando S. 723
 Peret, Teresa C. T. 800
 Perez, Carmen L. 898
 Pérez, Juan 109, 1088
 Pérez, Mary C. 165, 166
 Perkins, Douglas J. 339, 371, 640, 936, 937, 1022, 1230
 Perng, Guey Chuen **46**
 Perniciaro, Leon 843
 Perry, Chelsey 14
 Perry III, Henry B. 524
 Peruski, Leonard F. 416, 418, 702
 Pesko, Kendra 749
 Peters, Jennifer 600, 1121, 1122
 Peters, Nathan 1241
 Peterson, Kristine M. **277**
 Petrarca, Vincenzo 681, 1168
 Petri, Jr., William A. 277, 289
 Pets, Evelin 923
 Peyton, David H. **975**
 Pezzarossi, Nancy 98
 Pfarr, Kenneth 515
 Phillips, Aaron 489
 Phillips, Anastasia 1192
 Phillips-Howard, Penelope A. 214, 1033
 Phipps-Yonas, Hannah 43
 Phiri, Isaac K. 37
 Phiri, Kamija S. 474
 Phong, Nguyen C. 467
 Phordee, Warunyu 702
 Phuanukoonnon, Suparat **703**
 Piera, Kim 1183, 1194
 Pierce, Mark A. 24, 642, 1005, **1039**
 Pierce, Susan K. 220, 325, 620, 621, 622, 623
 Pierre, Druilhe 856
 Pierson, Theodore C. 804
 Pigeon, Olivier 1052
 Pillai, Maheswaran M. **503**
 Pillai, Smitha **515**
 Pilotte, Nils 141
 Pimentel, Guillermo 266
 Pimgate, Chusak 125
 Pinder, Margaret **793**
 Pineda, Fernando J. 694
 Pineda, Vanessa 768, 1028
 Ping Chen, Ping 644
 Pinkerton, Relana 73
 Pinto, Antonio G. 1175
 Pinto, Joao 1168
 Pinyoratanachote, Arunya 1119
 Piola, Patrice **855**
 Pion, Sébastien D. S. **130**, **1156**
 Piper, Joe 1085
 Pirard, Marjan 1180
 Pitaluga, Andre N. 55
 Pitmang, Simon 584
 Planer, Joseph D. 1206
 Plassmeyer, Matthew L. **3**, 1038
 Platt, Kenneth B. 501, 809
 Plattner, Jacob **162**, 1205
 Platzer, Edward G. 1177
 Pleydell, David 403
 Plikaytis, Brian 264, 883
 Plotkin, Joshua B. 767
 Plowe, Christopher V. 25, 728, 989, 1036
 Plyusnin, Alexander 722
 Plyusnina, Angelina 722
 Poespoprodjo, J R. **796**
 Poetker, Shelene 355
 Pohlig, Gabriele 542
 Poinsignon, Anne **737**, 1219
 Pokhrel, Bharat M. **66**
 Polhemus, Mark 178, 544, 763, 969, 983
 Pollard, William 461
 Pollissard, Laurence 391
 Polman, Katja 296, 364, **1150**, 1180
 Polsomboon, Suppaluck 260
 Polyak, Christina 803
 Pombi, Marco 679, **681**, 693
 Ponce, Karina 413
 Ponce-de-Leon, Gabriel 71
 Ponce-Garcia, Gustavo 1063, 1067
 Pondja, A. 438
 Pong, Clinton K. 934
 Ponnusamy, Loganathan 780, 1097
 Pontes, Maria 423
 Pontes, Núbia N. 421
 Poo, Jorge L. 386, 387
 Poole, B. K. **122**
 Poovassery, Jayakumar 1188
 Popper, Stephen J. **14**

Porter, Kevin R. 716, 897, 896, 1109
 Porto, Aurelia 784
 Porto, Luiz Cristovão S. 999
 Posner, Gary H. 759
 Postigo, Jorge R. 871
 Potts, James A. 484
 Poudel, Prakash 447
 Poulakakis, Nikolas 683
 Poupard, Marie 1223
 Poupardin, Rodolphe 232
 Pourrut, Yves-Xavier 531
 Powell, Jeffrey R. 683
 Powers, Ann M. 500, 809
 Pradines, Bruno 972
 Praet, Nicolas 41
 Prager, Martin 454
 Prajapati, Surendra K. 224
 Prakash, Nirupama 18
 Prapasiri, Prabda 418
 Prasad, Jayendra 294
 Prasanthong, Rungnapa 385
 Preaud, Jean-Marie 264
 Premaratne, Prasad H. 1032
 Premji, Zul 764
 Premji, Zulfiqarali C. 172
 Press, Cynthia 1142
 Prestigiacomo, J 61
 Pretrick, Moses 132
 Preux, Pierre-Marie 130
 Preziosi, Marie-Pierre 264, 883
 Pri-Tal, Benjamin M. 668
 Price, Jessica L. 720
 Price, Ric 200, 796, 935, 1183, 1194
 Prichard, Roger 356, 1156, 1228
 Priotto, Gerardo 424
 Pritt, Bobbi S. 955
 Proano, Roberto 140
 Proux, Stephane 966
 Provost-Javier, Katie 662
 Puangpeeapichai, Thaiboonyong 1119
 Puffer, Bridget A. 495
 Pukrittayakamee, Sasithon 633
 Pullan, Rachel L. 133
 Puma, Lwipa 570
 Punjabi, Narain 105
 Purnama, S. 708
 Pussini, Nicola 1161
 Putaporntip, Chaturong 635, 637
 Putnak, Robert 120
 Putnam, Shannon D. 105, 426, 802

Q

Qadri, Firdausi 365, 414, 415
 Qifang, Shi 1042
 Quakyi, Isabella 235
 Quang, Nguyen N. 449
 Queiroz, José W. 421, 872
 Quick, Linda 93, 816

Quick, Rob 16, 99, 106
 Quijano, Eberth 1102
 Quijano-Hernandez, Israel 922
 Quinhento, Vátusia 229
 Quinn, Matthew H. 44
 Quinnell, Rupert J. 133, 469
 Quintero-Gil, Carolina 497
 Qureshi, Ammar 179
 Qvarnstrom, Yvonne 287, 826, 1176

R

Raczniak, Greogry 1166
 Radhakrishnan, Sujatha 479
 Rahman, Muhammad Aziz 319
 Rahman, Mahmudur 319, 1222
 Rahul Fadnis, Prachi 905
 Rai, Dev R. 1147
 Raikhel, Alexander S. 1174, 1199
 Raj, Vishal 108
 Rajakaruna, Rupika S. 226
 Rajapandi, Thavamani 230, 939
 Rajasekariah, G-Halli R. 76, 86, 92, 448
 Rajwans, Nimerta 1184
 Rakers, Lindsay J. 1117
 Raksanegara, Ardini S. 1109
 Ram, Pavani K. 17, 18, 100, 101, 102, 263, 368, 370
 Ramaiah, Kapa 1112
 Ramakrishnan, Vijay 298
 Ramamurthy, Nalini 834
 Ramanathan, Roshan 420, 1153
 Ramanathan, Suresh 873, 1193
 Ramaswmy, Rajendranath 161
 Ramelan, Wahyuning 13
 Ramey, Kiantra I. 917
 Ramineni, Bhanumati 645
 Ramírez, Andrés 546
 Ramirez, Cesar 744
 Ramirez, Josue 57
 Ramirez, Jose L. 428, 1071
 Ramírez, Martha C. 165
 Ramirez, Ruth E. 899
 Ramirez-Sierra, Maria Jesus 844, 922
 Ramos, Mary 898
 Ramos-Rodriguez, Mariana 709
 Ramzy, Reda M. R. 131
 Randeniya, Preethi V. 1032
 Randrianarivelojosia, Milijaona 611, 613
 Ranford-Cartwright, Lisa 407
 Rankov, Leonid 503
 Ranson, Hilary 232, 1215
 Ranucci, Elisabetta 30
 Rao, Grace 136, 1118
 Rao, Muralidhara 19
 Rao, Ramakrishna U. 427, 433, 517
 Rasgon, Jason L. 662, 676
 Rasmussen, Terri A. 459
 Ratcliffe, Amy 93

Rathore, Dharmendar 594, 811
 Rattendi, Donna 557
 Rätti, Osmo 317
 Rausch, Kelly M. 22, 645
 Ravdin, Jonathan 280
 Raverdy, Sylvine 515, 523
 Rawson, Ian 631
 Ray, Prabhati 581
 Rayavara, Kempaiah 221
 Rayner, Julian C. 653, 1045
 Razuri, Hugo R. 309, 320
 Razzauti Sanfeliu, Maria 722
 Rea, I. 422
 Redding, Kevin M. 1152
 Reddy, Michael R. 738
 Reddy, Vijayalakshmi 905
 Redmond, Seth 1078
 Reed, John L. 989
 Reed, Steven G. 564
 Reeder, John 819
 Reese, Necole 978, 979
 Regis, David 7, 1034
 Reif, Kathryn E. 783
 Reimels, William 810
 Reimer, Lisa J. 241
 Reimert, Claus M. 300
 Reingold, Arthur 705
 Reis, Eliana A. G. 751, 902, 903
 Reis, Mitermayer G. 68, 673, 751, 901, 902, 903
 Reisen, William K. 256, 1092
 Reiter, Karine 3, 1038
 Reithinger, Richard 216
 Relman, David A. 14
 Remich, Shon 458
 Remington, Jack S. 1142
 Remoue, Franck 324, 737, 1093, 1219
 Renaud, François 206
 Resende, Mafalda 641
 Restrepo, Bertha N. 899, 900
 Reuter, Stefan 402
 Rewerts, Cindy 537
 Reyes, Lissette 98, 777
 Reyes, Miguel 705
 Reyes, Nora 1099
 Reyes, Sharina 7
 Reyes-Solis, Guadalupe C. 1063, 1067
 Reynolds, Christine 568
 Reynolds, Steven 73
 Rhman, Bassem Abdel 266
 Rhodes, Michael T. 85
 Ribeiro, Gilmar J. 673
 Ribeiro, Isabela 731, 951
 Ribeiro, José M. 941, 1070, 1172
 Ribeiro, Paula 307, 741
 Richards, Allen 780
 Richards, Frank O. 35, 216, 335, 527, 874, 1003, 1117, 1157, 1160
 Richards, Stephanie L. 692, 749
 Richardson, Eugene 827
 Richardson, Jason 416, 734, 980
 Richardson, Susan E. 262

Richardus, Jan Hendrik 1167
 Richie, Thomas L. 5, 6, 7, 644, 1018, 1034, 1037, 1046
 Richman, Adam 1
 Richter, Martin H. 1126
 Rick, Fairhurst 866
 Rider, Mark A. 849, 1083
 Rieckmann, Karl H. 450, 973
 Riedesel, Melissa A. 1007
 Riehle, Michael A. 668, 669, 1135
 Rienthong, Somsak 702
 Rijal, Basista Prasad 66
 Riley, Eleanor 26, 32, 795, 997, 1016, 1229
 Rimi, Nadia A. 715
 Riner, Diana K. 242
 Ringwald, Pascal 774
 Rini Poespoprodjo, Jeanne 935
 Rippert, Anja 991
 Riquelme, R. 1127
 Riscoe, Mike 760
 Rivera, Cedillo 887
 Rivera, Fulton P. 825
 Rivera, Yisel 886
 Rivero-Cardenas, Nubia 732
 Rivers-Davis, Andrea 288
 Rivière, Gilles-Jacques 568
 Rizal, Suman 445
 Rizvi, Moshahid A. 224
 Rizzo, Nidia R. 869
 Robb-McCord, Judith 216
 Robert, Willie 1130
 Roberts, Jacquelin 1142
 Roberts, Lisa O. 321
 Robertson, Janelle L. 275
 Robins, Melissa L. 18
 Robinson, Jamie S. 834, 905
 Robles Lopez, Jose Luis 57
 Robles-Barcena, Miguel 39
 Roca, Yelin 1099
 Rocha, Crisanta 14, 47, 388
 Rocha, Claudio 316, 890
 Roche, James K. 104, 288
 Rocheleau, Thomas A. 663
 Rochford, Rosemary 581
 Rock, Dabiré 1217
 Rocke, Tonie E. 1161
 Rodart, Itatiana F. 901
 Rodnak, Ditthakorn 957
 Rodpradit, Prinyada 125
 Rodrigo, W.W. Shanaka 486, 490
 Rodrigues, Janneth 691, 1070, 1170
 Rodrigues, Raquel F. 561, 920
 Rodrigues, Sueli G. 721
 Rodrigues-Silva, Rosangela 436
 Rodriguez, Aixa 557
 Rodriguez, Nilda E. 160
 Rodriguez-Neaves, Nydia A. 1063
 Roeffen, Will 993
 Roehrig, John T. 489, 830
 Roellig, Dawn M. 548
 Rogers, David W. 1069

- Rogers, William O. 599, 876
 Rogerson, Stephen 75, 323, 819, 935, 1195
 Rogier, Christophe 972
 Rohim, Abdul 376
 Rohmer, Michel 187
 Rollinson, David 296
 Romanini, Maria C. 923
 Romano, Alessandro 423
 Romeo, Sergio 976
 Romero, Ibeth 454
 Romero, Liliana M. 825
 Romero, Sylvia 1140
 Romero-Severson, Jeanne 1072
 Romig, Thomas 404
 Romo, Flores 888
 Romoser, Margaret 695
 Romoser, William S. 695
 Roncal, Normal 979
 Roncalés, María 971
 Rondon, Johan 533
 Rondon, Maritza 240
 Rood, Michael 480
 Roper, Cally 72, 226, 344
 Rosa, Maria Elisa A. 1203
 Rose, Robert C. 486, 490
 Rosedo-Paredes, Elsy del Pilar 732
 Rosen, David 772
 Rosenberg, Ian 414
 Rosenblatt, Jon E. 955
 Rosenthal, Philip J. 84, 187, 336, 575, 591, 598, 729, 730, 818, 822, 1125
 Rosero, Doris A. 686
 Ross, Jennifer M. 278
 Rossi, Shannan L. 9
 Rossignol, Marie 737
 Rossnagle, Eddie 743
 Rothenberger, Meghan K. 280
 Rothman, Alan L. 125, 484, 889, 891
 Rothstein, Yarrow 189, 581, 758
 Rousset, François 1079
 Rout, Jonathan 136, 1118
 Rowland, Mark 377
 Rowley, David 813
 Rowley, Wayne A. 501
 Roy, Alma 1090
 Roy, Sajal 553
 Roy, Sharon 1140
 Ruang-areerate, Toon 267
 Ruangweerayut, Ronnatrai 865
 Rubie, Jennifer J. 76
 Rudge, James W. 329
 Rudiman, Irani F. 13
 Rudiman, Pandji I. F. 897, 1109
 Ruebush, Trent K. 1026
 Ruiz, Marilyn O. 1098
 Ruiz Espinosa, Aniran 1150
 Rujan, Iulian N. 938
 Rule, Ana 1143
 Rullas, Joaquín 706
 Rungruang, Thanaporn 181
 Rungsihirunrat, Kanchana 593
 Rupprecht, Charles E. 265, 312
 Rusangwa, Christian 870
 Rusconi, Carla 976
 Rush, Amy C. 520
 Russell, Brandy 834
 Russell, Tanya L. 247
 Russo, Elizabeth T. 16
 Ruth, Laird 106
 Rutta, Acleus 23, 608
 Rwakimari, John B. 395, 1125
 Ryan, Edward T. 365, 414, 415
 Rye, Erika 813
- S**
- Sa, Juliana M. 774
 Saad, Magdi D. 1166
 Saavedra-Rodriguez, Karla L. 1061, 1063, 1067
 Sabeti, Pardis C. 406, 1211
 Sabin, Lora 602, 1006, 1008
 Saborío, Saira 705
 Sachs, Paige B. 242
 Sack, R. B. 97
 Sacko, Adama 241
 Sacko, Moussa 359
 Saffa, Sidiki 1130
 Safi, Najibullah 54
 Safi, Noorulhaleim Z. 54
 Sagara, Issaka 24, 172, 1005, 1036
 Sagnon, N'Falé 1059, 1084
 Sah, Binod K. 113, 488, 491
 Sahasakmontri, Nongnard 120
 Saito, Akio 30
 Saito, Mayuko 798
 Sakamoto, Hirokazu 1044
 Sala Gallini, Giuseppe 443
 Salanti, Ali 641
 Salas, Carola J. 194, 197, 1025
 Salazar, Milagros 312
 Salcedo, Enrique 1029
 Saldaña, Azael 768, 1028
 Salgado, Hugo 590
 Lidwina Salim 439
 Salim, N. 27
 Sall, Amadou A. 1106, 1165
 Sallam, Atiya 1179
 Sallas, William M. 171
 Sallusto, Federica 44
 Salman, Sam 1195
 Salmavides, Frine 878
 Salmon-Mulanovich, Gabriela 312, 320
 Salumbides, Brenda 940
 Salvana, Edsel Maurice T. 380
 Salwati, Ervi 13
 Sama, Grace 1015
 Sama, Woquan 239
 Samake, Sibiry 866
 Samalvides, Frine 879
 Samarakoon, Upeka 990
 Sambian, D. 28
 Sambo, Maria R. B. 229
 Sambo, Y. 1117
 Samir, Ahmed 266
 Sampane-Donkor, Eric 21
 Sampath, Aruna 188, 581
 Samsi, Kiki M. 896
 Samsi, Tatang K. 896
 Samudio, Franklyn 1028
 Samy, Abdallah M. Samy. 442
 Sananikhom, Pany 121
 Sanasuttipun, Wiwan 800
 Sanchez, Bruno A. Marinho. 1021
 Sanchez, Deyanira 1107
 Sanchez, Eduardo 468
 Sanchez, Felix 1101
 Sandison, Taylor 729, 944, 1050
 Sang, Rosemary C. 907
 Sangare, Cheick P. O. 950
 Sangare, Lansana 1182
 Sangha, Jasbir K. 1048
 Sangweme, Davison 342
 Sankara, Dieudonne 464
 Sanogo, Dramane 128, 129, 787, 789, 1232
 Sanogo, Mariam 1004
 Sanogo, Youssouf 1004
 Sanon, Antoine 1082
 Sanon, Souleymane 1017, 1031, 1041
 Sanprasert, Vivornpun 526
 Santaella-T, Julian 469
 Santamaría, Ana María 768, 1028
 Santana, Nelma 902, 903
 Santelli, Ana Carolina F. S. 951
 Santiago, Gilberto A. 123
 Santiago, Helton 815, 1175
 Santolalla, Meddy L. 197, 1025
 Santolamazza, Federica 1168
 Santos, Carlos G. 673
 Santos, Fatima 999
 Santos, J. M. 751
 Santos, Silvano B. 784
 Santos, Thiago B. 919
 Santos da Silva, Natal 211
 Saracino, David 414
 Saravia, Nancy 454
 Saric, Jasmina 352, 363
 Sarkar, Rouha A. 715
 Sarkar, Shrisendu 374
 Sarr, Demba 1188
 Sarr, Jean Birame 324
 Sarr, Jean B. 254
 Sarr, Ousmane 406, 1211, 1212
 Sasi, Philip 991
 Sateren, Warren B. 269
 Satimai, Wichai 957, 958, 1119, 1120
 Satoguina, Judith S. 1229, 1016
 Sattabongkot, Jetsumon 980, 1043
 Sauerwein, Robert 196, 993
 Saul, Allan 22, 642, 1047
 Saunders, David 589, 1207
 Saute, Francisco 71
 Sauve, Laura 262
 Savage, Harry 671
 Savarese, B. 26, 28
 Saviolakis, George A. 182
 Savranskaya, Tatiana 643
 Sawadogo, Simon P. 1082
 Saye, Renion 24, 787, 987, 1005
 Sayer, David 688
 Sazzad, Shahed 319
 Scaraffia, Patricia Y. 1136
 Schaffner, Stephen F. 406, 1211
 Schal, Coby 1097
 Schapira, Allan 219, 792
 Scheld, W. Michael 73
 Schenider, Bradley S. 513
 Schieck, Elise 991
 Schiehsler, Guy A. 973
 Schlesinger, Jacob J. 11, 44, 486, 490
 Schlienger, Raymond 570
 Schmaedick, Mark A. 1114
 Schmid, Caecilia 424
 Schmidt, Justin 60
 Schmutzhard, Erich 1190
 Schnabel, David 799, 983
 Schochetman, Gerald 962
 Schoepp, Randal J. 314, 714
 Scholtz, L. 1103, 1127
 Schountz, Tony 1104, 1105
 Schousboe, Mette L. 226, 328
 Schuller, Elisabeth 835
 Schultz Hansen, Kristian 820
 Schulze, Alexander 396, 573
 Schwab, Kellogg 1143
 Schwabe, Christopher 34, 790
 Schwartz, Ira 48
 Schwartz, Owen 36
 Scollard, D. M. 61
 Scott, Erick 36
 Scott, Paul 269
 Scott, Philip 355
 Scott, Thomas W. 49, 125, 682, 734, 890, 894, 1089, 1091
 Sebastian, Silvie 1185
 Sebunya, Kiwe 16
 Séchaud, Romain 568
 Seck, Ibrahim 967
 Secor, William Evan 297, 299, 302, 330, 332, 333, 358, 362, 742, 788
 Sedegah, Martha 7, 646, 1034, 1037
 Seethamchai, Sunee 635, 637
 Segeja, Method 23
 Segeja, Method D. 608, 1012
 Segovia, Rosana 413
 Segura, Jose Luis 34, 209, 790
 Seguro, Antonio 425, 444, 446
 Sehgal, Rahul 108
 Seidahmed, Osama 1057
 Seif el-Din, Sayed H. H. H. 293
 Seino, Kathy 506
 Sem, Rithy 599
 Sembuche, Samuel 23, 155, 195, 608

- Semenova, Elena 6, 644
 Sen, Debrup 553
 Senanayake, Sanath C. S. A. **842**
 Senbanjo, Idowu O. **218**
 Sendagire, Hakim **882**
 Senglat, Marie 1093
 Senkoro, Kesheni 525
 Senn, Nicolas **819**
 Sepe, Daphne 607
 Serghides, Lena 1187
 Serrano, Adelfa 190, 555, 578
 Servilleja, Jesus E. **107**
 Servina, Gomorraí 1195
 Seth, Misago D. 1012
 Setiabudi, Djatnika 896
 Severini, Carlo **206**
 Severson, David D. 1072, 1074
 Sevilleja, Jesus Emmanuel A. D. 104, 288
 Shaffer, Donna 22, 642
 Shafir, Shira 1001
 Shahum, Andrea 156
 Shaikh, Gulvahid **152**
 Shaikh, Jean 528
 Shakarian, Alison M. **157**
 Shakya, Krishna P. 427
 Shamad, Mahdi 140, 1160
 Shane, Hillary L. 333
 Shang, Chuin-Shee **482**, 496
 Shainheit, Mara G. 1242
 Shankar, P A. 19
 Shanks, Dennis 202, 467, 973
 Shapiro, Theresa A. 762
 Sharakhov, Igor V. 674, 675, **677**, 678
 Sharakhova, Maria V. 674, 675, 677, **678**
 Shargie, Estifanos B. **35**, 216, 1003
 Sharlow, Elizabeth R. **472**
 Sharma, Rishi 503
 Sharma, Surya K. **203**
 Sharma, Yagya D. 1011
 Sharp, Brian 234
 Shehata, Magdi G. Shehata. **442**
 Sheikh, Alaullah 414
 Sheikh, Mehraj 1226
 Shepard, Donald S. 113, 390, **488**, 491
 Sheth, Anandi N. **16**
 Shi, Hui 1186, **1210**
 Shi, Pei-Yong 806
 Shi, Ya Ping 214, 594, 826, 1033
 Shibata, Hiroki 893
 Shiff, Clive J. 305, 393
 Shikama, Félicien 870
 Shimada, M. 1056
 Shimp, Richard 3
 Shin, Dongyoung **1072**
 Shin, Hyunjin 1151
 Shin, Sang Woon 1174, **1199**
 Shinondo, Cecilia 986, 988
 Shomari, M. 27
 Shono, Yoshinori 1218
 Shrestha, Mohanish 537
 Shu, Bo 719
 Shu, Jianfen 277
 Shukla, Man M. 1006, 1008
 Shultz, Leonard 587
 Siba, Peter 703, 1158, 1195
 Sibley, Carol H. 973
 Sie, Albert 819
 Siegel, Richard M. 379
 Sien, L. W. 708
 Sihuincha, Moises 890
 Sikalima, Jay 305, 393
 Sikasunge, Chummy S. **37**
 Silengo, Shawn J. 493, 892
 Sillah, Ansumana 1225
 Silva, Breno M. 117
 Silva, Helder R. 902, 903
 Silva, Liliane G. 919
 Silva, Luciano K. 673, 751
 Silva, Sheyla 47
 Silva, Wilda 704
 Silva-Ibanez, Maria 440
 Silveira, Alda Maria S. 303
 Sim, Cheolho **655**, 664
 Sim, Kim Lee 1
 Sim, Shuzhen 1071
 Simard, Frederic 679, 681, 683, 746, 1169
 Simkin, Alfred 222
 Simmons, Cameron 1224
 Simon, Cousens 856
 Simon-Chazottes, Dominique 805
 Simondon, François 324, 737, 1219
 Simondon, Kirsten 324
 Simons, Hilary 852
 Simpson, Jennifer E. **697**
 Simpson-Haidaris, Patricia J. 11
 Sims, Jennifer S. **775**
 Sims, Peter A. 775
 Simsek, Kemal 543
 Sinden, Robert E. 207, 250
 Siner, Angela **946**
 Singh, Balwan 650
 Singh, Balbir 946
 Singh, Jasjit 65
 Singh, Inder 205
 Singh, Jaspreet 108
 Singh, Mrigendra P. 602, 1006, 1008
 Singh, Nalini 610
 Singh, Neeru 341, 602, 984, 1006, 1008, 1011, 1013
 Singh, Puspendra P. 1011, **1013**
 Singh, Rupa 447
 Sinkala, Moses 570
 Sinnis, Photini 928
 Siqueira, Isadora 784
 Siqueira, Joao B. 113, 491
 Siqueira, Nilton G. 436
 Siriarayapon, Potjaman 110
 Sirima, Sodiomon 859, 1017, 1031, 1041
 Sirimanna, Ganga 550
 Sirinarm, Pokasem 702
 Sirisopana, Narongrid 801
 Siriwardana, Yamuna D. **549**, **550**
 Sisouk, Thongchanh 121
 Sissoko, Mahamadou S. 24, 25, **756**, **1005**, 1036
 Sit, N.W. 1193
 Siv, Sovannaroeth **1049**
 Sivapalan, Murugesu 1098
 Skerker, Jeffrey M. 977
 Skinner, Jason 379
 Slater, Madeline 818
 Slatko, Barton 430, 515, 516, 518
 Slebodnick, Carla 811
 Sligar, Jessica M. 537
 Slike, Bonnie M. 10
 Sloan, Lynne M. 955
 Slotman, Michel A. **683**, 738
 Slowikowski, Jacek J. 107
 Slutsker, Laurence 72, 212, 214, 372, 594, 826, 1033
 Sluzas, Emily M. 495
 Smartt, Chelsea T. 692
 Smilkstein, Martin 760
 Smith, Bryan 178, 1120
 Smith, Bryan L. **763**
 Smith, Geoffrey 1188
 Smith, Kathryn 7
 Smith, Kristin E. 661, **1171**
 Smith, Lucy A. **572**
 Smith, Michael P. 780
 Smith, Peter 94, 950
 Smith, Peter J. S. 1171
 Smith, Stella I. 151
 Smith, Thomas A. 219, 792, 995
 Smithyman, Anthony M. 76, 86, 92, 448
 Snell, Paul 1225
 Snider, Cynthia **289**
 Snounou, Georges 633
 Snow, Robert 817
 Sobel, Jeremy 423
 Soberon, Valeria R. L. **197**
 Sobsey, Mark **15**
 Socha, Aaron 813
 Socheat, Duong 599, 865, 997
 Sodha, Samir V. **99**
 Sodiomon, Sirima B. 1035
 Soeharso, Purnomo 13
 Sofarelli, Theresa 460
 Sohn, Eun-Hwa 942
 Soisson, Lorraine 5, 7, 25, 646, 647, 969, 1034, 1036
 Sokhal, Buth 426
 Sokhna, Cheikh 324, 737
 Sokolova, Yuliya Y. 459
 Solberg, Owen D. **1164**
 Solorzano, Elizabeth 59
 Solorzano, Nelson 850
 Somé, Fabrice 985
 Somoulay, Virasack 121
 Song, Guanhong 22, 1043
 Sonye, George 699, 1056
 Soong, Lynn **560**, 1197
 Sorensen, Bess 1124
 Sorgho, Hermann **306**
 Soriano Arandes, Antoni **701**
 Sorontou, Yohanna 196, 376
 Sorvillo, Frank **1001**
 Sosa-Estani, Sergio 860
 Soto, Giselle 709
 Soto, J. 422
 Soto-Castellares, Giselle 798
 Soulama, Issiaka 1017, **1031**, 1041
 Souleymane, Sanou 877, 1035
 Soumaoro, Lamine 129, 787, 789, 1232
 Soumaré, Mohamadou L. 1106
 Soumaré, Peinda O. L. **1106**
 Soumarou, Lamine 128
 Sousa, Jason 978, **979**
 Sousa, James D. 872
 Sousa, Tais N. **225**, 1021
 Souza-Neto, Jayme A. **1071**
 Sovero, Merly 719, 1101
 Sow, Cheikh S. 1219
 Sow, Samba 264
 Sow, Seydou 364
 Sow, Samba O. **797**, 883
 Sowunmi, Akintunde 574, 597, 764
 Spano, Robyn 480
 Sparatore, Anna 976
 Specht, Sabine **383**
 Spichler, Anne **425**, **444**, **446**
 Spillmann, Cynthia 58
 Spiro, David 520
 Spitzer, Dirk 1208
 Spring, Michele 7, 646, **647**, **1040**
 Sreng, Bun 110
 Srethapranai, Vanlaya 110
 Srichantrapunt, Wisuth 801
 Sridaran, Sankar **347**, 408
 Srijan, Apichai 270
 Srikiatkachorn, Anon 484, 891
 Srinivasan, Prakash **838**
 Sripa, Banchob 290
 Srisaengchai, Prasong 418
 Srivastava, Shweta **285**
 Sriwichai, Sabaithip 1120
 Ssekabira, Umaru 395
 Ssewanyana, Isaac 1189
 Staalsoe, Trine 627
 Staedke, Sarah G. 84, 93, 576, 725, 816, 1125
 Stafford, Richard 1
 Stange-Thomann, Nicole 1211
 Stankiewicz, Maria 233
 Staples, J. E. 419
 Stark, Lillian 500
 Stauffer, William 280
 Stedman, Timothy 230, 939
 Steel, Cathy **143**
 Stefaniak, Maureen E. 6, 644
 Steger, Kirby 356
 Steinauer, Michelle L. 330
 Steinbeiss, Victoria 7

- Steketee, Richard 216, 792
 Stephane, Tchicaya E. **236**
 Stephens, Chad 540
 Stepniewska, Kasia **859**
 Steurer, Francis 541
 Stewart, Alison **272**
 Stewart, Ann 965, 1036
 Stewart, Lindsay 773
 Stewart, V. A. 25
 Stich, August 402
 Stieglitz, Elliot 309
 Stiles, Jonathan K. 917, 984
 Stinchcomb, Dan T. 493, 511, 892
 Stocker, J. T. 786
 Stoddard, Steven T. **890, 894**
 Stojan, Jure 233
 Stolk, Wilma A. **1159**
 Stone, Chris M. **736**
 Stoops, C. A. 708
 Stout, Rhett W. 783
 Stoute, José A. 1208
 Stracener, Catherine N. 1208
 Straimer, Judith J. **991**
 Streit, Thomas 141, 1154
 Strode, Clare 232
 Stryjewska, B. 61
 Stuart, Melissa A. 845
 Studer, Alain 219
 Stufe, Ansgar 130
 Sturgeon, Michele M. **480**
 Su, Qin 143
 Suarez, Gloria 777
 Suarez, Jorge 552
 Suarez, Luis 1099
 Suarkia, Dagwin L. 703
 Suaya, Jose A. **113, 390, 488, 491**
 Suazo, Harold 733
 Subedi, Janardan 1147
 Suchdev, Parminder 106
 Sudimack, Dan 1147
 Sudjana, Primal 896, 897, 1109
 Sudo, Atsushi 412
 Sudré, Adriana P. 436
 Sueker, J. Jeremy **862**
 Sugiarto, P. 796
 Suhaimi, Mohamed 1193
 Sukkam, Sanya 1119
 Sulaiman, Suad M. Ahmad. Sulaiman. 1095
 Sullivan, David J. 94, 393
 Sultana, Rebeca 712, **715, 1131, 1222**
 Sultana, Sharmin 319
 Sumba, Peter Odada 215, 326, 1020
 Sun, Jenny 68
 Sun, Jiaren 560
 Sun, Jian 660
 Sun, Jianxin 1172
 Sun, Joseph C. 336
 Sun, Tao 399
 Sun, Wellington 123, 502, 898
 Sunderland, Deirdre 1143
 Sunyakumthorn, Piyanate 267
 Supali, Taniawati **1113**
 Supan, Christian 199
 Suphapeetiporn, Kanya 481
 Surin, Johari 276, 1179
 Susanto, Nugroho H. 896, 897, **1109**
 Susapu, Melinda 607, 1115, 1158
 Sutherland, Colin J. 32, 346, 954
 Suthirattana, Saithip 416, **418**
 Suwandono, Agus 716
 Suwansrinon, Kanitta **63**
 Suzuki, Ryosuke 111
 Suzuki, Stephanie 593
 Svennerholm, Ann-Mari 365
 Sweat, Mark 540, 547
 Swierczewski, Brett E. **757**
 Syafruddin, Din 196, 376, 1185
 Sykes, Melissa L. **163, 536**
 Sylla, Massamba 769, 1065
 Sylla, Mariam 797
 Sylverken, J. 28
 Syphard, Luke M. 347, 408
 Szeki, Sebastian 1192
 Szumlas, D.E. 847
- T**
- Tabachnick, Walter J. 692, 749
 Tachibana, Mayumi 840, **1043**
 Tadesse, Zerihun 35, 216
 Taft, Andrew S. **754**
 Tagle, Joseph 115
 Tahar, Rachida 198
 Tajima, Shigeru 8
 Takala, Shannon L. 25, 1036
 Takasaki, Tomohiko 8
 Takem, Ebako N. **204**
 Takeo, Satoru 1043, **1044**
 Talaat, Kawsar 420
 Talisuna, Ambrose 177, 576, 1125
 Tallo, Veronica 389, 1181
 Tally, John 1207
 Tamarozzi, Francesca **405, 443**
 Tamminga, Cindy **7, 1034**
 Tan, Asako 990
 Tan, B. **457**
 Tan, Kavin 1210
 Tan, Lian H. 113
 Tan, Ratna I. 897, 1109
 Tan, Shyong Wei 1186
 Tangpukdee, Noppadon 873, 1184
 Tanner, M. 27
 Tanomsing, Naowarat **633**
 Tanowitz, Herbert B. **558, 565**
 Tanwisaid, Kittisak 418
 Tanyuksel, Mehmet **435, 543**
 Taoromina, Joanna 717
 Tapia, Laura L. **1014**
 Tapia, Milagritos 264, 797, 883
 Tapia, M. 1103, 1127
 Tappero, Jordan W. 729, 944, 1050
 Tar, Moses **565**
 Tarafder, Mushfiqur R. **1181**
 Taramelli, Donatella **976**
 Tarazona-Santos, Eduardo M. 225
 Targett, Geoffrey 324
 Tarique, Abdullah 414
 Tarleton, Rick L. 1196
 Tarnagda, Zékiba 41
 Tarun, Alice S. **837**
 Tassara, E. 1127
 Taylor, Diane W. 327, 934, **1015**
 Taylor, Mark J. 430, 431
 Taylor, Melanie M. 130
 Taylor, Ronald P. 338
 Taylor, Robert W. 376
 Taylor, Terrie E. 728, 772, 989
 Taylor, William 859
 Taylor, Walter 470, 471, **873, 952, 1193**
 Teates, Kathryn 106
 Teelen, Karina 993
 Teferi, Tesfaye 1003
 Teixeira, Clarissa 866, 918, 921
 Teja-Isavadharm, Paktiya 589
 Tekete, Mamadou 727, **950**
 Tekwani, Babu 581, 857
 Telford, Sam R. 779, 781
 Telleria, Erich L. **846**
 Tellez, Yolanda 126
 Tempone, Antonio J. 55
 Tenaw, Eskinder 35, 216
 Tendongfor, Nicholas 384
 Tenorio, Antonio 118
 ter Kuile, Feiko O. 214, 609, 731, 1033
 Terashima, Angelica 879
 Terlouw, Dianne 214, 731, 1013, 1033
 Tero, D'thong 599
 Terpening, Sara 62
 Terpinski, Jacek 973
 Tesh, Robert B. 316, 724
 Tetteh, Kevin K. A. **636, 773**
 Teuscher, Franka **1121**
 Thailayil, Janis 1069
 Thamsborg, Stig M. 438
 Thamthitawat, Somsak 418
 Thangamani, Saravanan 258, **1172**
 Thanh, Nguyen X. 449, 467
 Thapar, Mita 179
 The Trung, Dinh **1224**
 Theander, Thor G. 328, 345, 601, 601, 641
 Theilgaard, Zahra 155
 Theodore, Ted 824
 Thera, Mahamadou A. **25, 1036**
 Thesing, Phillip 728, 989
 Thévenon, Audrey D. **934**
 Thi Thu Thao, Le 1224
 Thiam, Sylla 967
 Thibodeaux, Brett A. **830**
 Thien, Nguyen X. 467
 Thior, Papa M. 967
 Thipsuk, Charnchai 702
 Thisyakorn, Chule 147
 Thisyakorn, Usa 147, 481
 Thomas, Charlie 6, 644
 Thomas, Stephen **120**
 Thompson, Andrew 401
 Thompson, Richard C. A. **1204**
 Thompson, Trevor 459
 Thompson, Winston 917
 Thomson, Russel 1234
 Thongkukiatkul, Amporn 840
 Thonnard, Joelle 25, 1036
 Thuma, Philip E. 94, 208, 393, 840, 988
 Thuy, Tran T. 12, 893
 Thwing, Julie I. **71, 72**
 Tibenderana, James 177
 Tierney, Ev 646
 Tijani, Muyideen K. **624**
 Tilahun, Abate 1003
 Timbine, Atime 727
 Tindanbil, Daniel **201**
 Tine, Roger C. L. 967
 Ting, Li-Min 928
 Tinh Hien, Tran 1224
 Tinley, Kathleen E. **868**
 Tinoco, Yeny 719
 Tiono, Alfred **584, 1017, 1031, 1041**
 Tipayamongkholgul, Mathuros **114, 496**
 Tiruvury, Hemavarna **707**
 Tisch, Daniel J. **215, 326, 380, 529, 1158**
 Tiwari, Avdesh 445
 Tjaden, Jeffrey A. 1166
 Tjitra, Emiliana 796, **865, 935, 1183, 1194**
 Tobias, S. 708
 Todd, Charles W. 535
 Toe, Hyacinthe K. **1084**
 Tohya, Yukinobu 412
 Tokechi, Arturo 468
 Tokumasu, Fuyuki 941
 Toledo, J 422
 Tolosa, Michel Tolosa 1221
 Tolouei Semnani, Roshanak **379**
 Toma, Luigi 173
 Tomashek, Kay M. **898**
 Tomc, Christa 695
 Tomicic, V. 1127
 Tompkins II, Rodman D. 1108
 Tongkong, Dokrak 1119, 1120
 Tongren, Jon Eric **477**
 Top, Samphornarann **213, 1010**
 Torii, Motomi 840, 1043, 1044
 Torreele, Els 424
 Torrero, Marina N. 144, **378, 786**
 Torres, Katherine **630**
 Torres, Pedro 971
 Torrez, Miguel 209
 Tosh, Donna 647
 Tosi, Alessia 976
 Touabi, Malek 966
 Touch, Sok 426, 802

- Touré, Abdoulaye M. 249
 Toure, Seydou 464
 Toure, Sekou 950
 Townson, Harold 745
 Tozan, Yesim **945**
 Tran, Tuan 999
 Tran, Thanh N. 970
 Traore, Abdrahamane 220, 622
 Traore, Boubacar 94, 220, 325, 620, 621, **622, 987**
 Traore, Bourama 866
 Traoré, Broulayé 1182
 Traore, Drissa 25
 Traore, Hamidou 987
 Traore, Karim 25, 1036
 Traore, Oumar B. 727
 Traore, Pierre 866
 Traore, Sitan 1004
 Traoré, Sekou F. 50, 128, 129, 241, 249, 787, 789, 1232
 Traore, Zoumana I. 727, 950
 Trape, Jean-François 324
 Traub-Cseko, Yara M. 55, 846
 Travassos da Rosa, Amelia P. A. 724
 Travassos da Rosa, Elizabeth S. 723
 Travers, Thomas 449
 Trenholme, Katharine **932**
 Trianty, Leily 935
 Trimarsanto, Hidayat 935
 Tripathi, Lalit M. 857
 Triquell, Maria F. **923**
 Trivedi, Kavita 99, 369
 Trofimovich, Lily 464
 Trongtokit, Yuwadee 1220
 Trovoada, Maria de Jesus **227, 229**
 Troyo, Adriana **684**
 Trudel, Richard 695
 Trueba, Gabriel A. **413, 1164**
 Trung, Trieu N. 467
 Tsamo, Etienne 187
 Tsang, Victor C. W. 439, 440, 864
 Tse, Margaret C. L. 46
 Tseng, Hsin-Chi 492
 Tsetsarkin, Konstantin 513, 1111
 Tshifu, Kitoto Antoinette 1000
 Tshiswaka Kashalala, Gauthier 853
 Tsofa, Benjamin 617
 Tsuboi, Takafumi 840, 968, 1043, 1044
 Tsukayama, Pablo **563**
 Tu, Zhijian 674, 678, 1168
 Tuan, Tran M. 12, 893
 Tuchman, Jordan 602, 1006, 1008
 Tucker, Bradley J. 501
 Tucker, Kathryn **969**
 Tucker, Matthew S. **1122**
 Tuddenham, Edward 1224
 Tuero, Iskra **452**
 Tuikue Ndam, Nicaise G. 641
 Tukaheba, Edridah M. 300
- Tuladhar, Nhuchhe Ratna 66
 Tumpey, Abigail 718
 Tumwine, James K. 1141
 Tuong, Vo V. 12
 Turell, Michael J. **257, 696**
 Twu, Olivia 774
 Tzipori, Saul 1141
- U**
- Ubalee, Ratawan **980**
 Ubol, Sukathida 483
 Uchime, Onyinyechukwu 3, **1038**
 Udagedara, Chandani 550
 Udhayakumar, Venkatachalam 197, 198, 343, 347, 392, 408, 594, 984, 1013
 Uejio, Christopher 57
 Ueno, Norikiyo **160**
 Ugwuegbulam, Cletus 179
 Ullum, Henrik 155
 Umaru, John 335, 874, 1117, 1157
 Umeh, Rich E. 764
 Umezawa, Eufrosina S. 535
 Ungchusak, Kumnuan 49
 Upadhayay, Ram P. 1147
 Upadhyaya, Megha **150**
 Urassa, Honorathy 247
 Urbano Ferreira, Marcelo 211, 604
 Urbina, Mary Paz 331
 Urdaneta-Marquez, Ludmel 1063
 Urgaonkar, Sameer 190
 Uribe, Andres 497
 Usurup, Jethro 703
 Utzinger, Jürg 352, 363
 Uzochukwu, Benjamin 169
- V**
- V, Kumaraswami 382
 V, Udhayakumar 1011
 Vaheri, Antti 317
 Vahey, Maryanne 1122
 Vaidya, Akhil B. 1030
 Vaillant, Michel 470, 471, 873, 952, 1193
 Valderrama, Amy L. 1140
 Valderrama, Liliana 915
 Valderrama-A, Carlos **687**
 Valdivieso, F 1127
 Valea, Innocent **964**
 Valecha, Neena 865
 Valencia, Cristian 1202
 Valenzuela, Jesus G. 848, 866, 918, 921, 1070
 Valerio, Laura 693
 Vallejo, Efrain 1099
 Valsanciacomo, Francesca 995
 Van Beckhoven, Dominique 1223
- van Buuren, Stef 731
 van den Bogaart, Erika 976
 Van den Eede, Peter **409, 994**
 Van Der Auwera, Gert 409
 van der Ven, Andre J. A. M. 1185
 van Dijk, Janneke 94
 Van Doren, Waltruda 791
 Van Dormael, Monique 1180
 Van Dyke, Melissa K. 996
 van Eijk, Annemieke 369
 Van Eijk, Erica 323
 Van geertruyden, Jean-Pierre **323, 791, 823, 829**
 van Gemert, GeertJan 993
 van Kuppevelt, Toin H. 30
 Van Ngoc, Tran 1224
 Van Overmeir, Chantal 409, 567, 994
 Van Voorhis, Wesley C. 977
 Vanchinathan, Veena 353
 vande Vegte-Bolmer, Marga 993
 Vanden Eynde, Jean Jacques 557
 VanEkeris, Leslie A. 1171
 Vangordon, Gail 480
 Vanlandingham, Dana L. 513, 1111
 Vansadia, P. 26
 VanBuskirk, Kelly M. 628
 Vapalahti, Olli 317
 Vargas, Jorge 1099, 1100
 Vargas, Maria Jose 14
 Vargas-Inchaustegui, Diego A. 560, 1197
 Vasan, S S. 1068
 Vasanthapuram, Ravi **834, 905**
 Vasconcelos, Helena B. 315
 Vasconcelos, Pedro F. C. **315, 721, 723**
 Vasilakis, Nikos 9
 Vasquez, Alicia 312
 Vasquez, Laura 271, 552
 Vasquez, Libia R. **271, 465**
 Vasquez-Prokopec, Gonzalo 894
 Vasquez-Ricciardi, Laura C. **465**
 Vaughan, Jefferson A. 522, **696**
 Vaughn, David 120
 Vaughn, David W. 484
 Vazquez-Prokopec, Gonzalo M. **58**
 Vedvick, Thomas S. 564
 Vekemans, J. 26, 27, 28
 Velandia, Daniel 545
 Vélez, Ivan D. 497
 Velez, Jason 904
 Velez-Ramirez, Daniel E. 164
 Vely, Jean Francois 592
 Venkatesan, Meera **676**
 Vennervald, Birgitte J. 300, 359
 Verani, Jennifer R. **333**
 Verastegui, Hector 367
 Verastegui, Manuela 1201
 Vercruysse, Jozef 364
 Vereecken, Kim 296, 364
 Verley, Janice 152
- Vermeire, Jon J. 814, **1231**
 Verne, Eduardo 825
 Verotta, Luisella 30
 Vesely, Brian 547
 Vestergaard, Lasse S. **155, 328, 345, 601**
 Vial, Pablo A. 713
 Victor, Melendez 589
 Vidal-Mas, Jaume **971**
 Videia, Elsa 705
 Vieira, Conceição M. A. 315
 Vieira, Rute 229
 Viera, Sara 586, 587
 Vijaykadga, Saowanit **1119**
 Villaça, Pedro 425, 444, 446
 Villafana, T. 26, 27
 Villalta, Fernando 924
 Villamizar, Nestor J. 134
 Villanueva, Miguel 109
 Villaran, Manuel 269, **1102**
 Villarreal, Juana 165, 166
 Villegas, Elci 1220
 Villegas, Leopoldo 408, 594
 Villegas, Rossana 943
 Villinger, Francois 46
 Villinski, Jeffrey T. Villinski. 442
 Vinayak, Sumiti **594**
 Vincent, Corbel 1217
 Vincent, Tim 1016
 Vincent, William 222
 Vinetz, Joseph 196, 452
 Virtanen, Mailis 570
 Vitalis, Renaud 746
 Vithessonthi, Kanyalak **147**
 Vivas, Livia 976
 Viviani, Simonetta 264, 883
 Vizuet-de-Rueda, Juan C. 556
 Vogel, Mari 538
 Volkman, Sarah **406, 772, 1211**
 von Seidlein, L. 26
 Vongphrachanh, Phengta 121
 Vonthanak, Saphonn 802
 Vora, Neil 729, 944, **1050**
 Vosswinkel, Katherine 141
 Vu Thi Que, Huong 391
 Vudtakanok, Judpon 801
 Vuitton, Dominique A. 399
 Vulule, John M. 72, 215, 326, 339, 369, 372, 615, 640, 651, 689, 690, 936, 937, 1007, 1019, 1020, 1022, 1230
- W**
- Wabwire Mangen, Fred 395, 816
 Wagner, Marissa 787
 Waidab, Woraman **481**
 Waite, Erica 294
 Waitumbi, John N. 338, 965, 983
 Walker, Edward D. 214, 689, 690, 1098
 Walker, Larry 188, 189, 581, 857
 Walker, Martin **1148, 1149**
 Walker, Todd W. 1058

- Walls, Colleen D. **281**
Walsh, Douglas 983
Walther, Michael 773, 930, 1016, 1229
Walton, Shelley F. 52, 854
Wamachi, Alex 785, 1233
Wamae, Anna W. 100, 101, 102, 368
Wamae, Annah W. 370
Wang, Cunshan 374
Wang, Chien-Chih 913
Wang, Marie 1102
Wang, Susan P. Y. 815
Wang, Tianping 329
Wang, Wei-Kung 496
Wang, Xunde 1182
Wang, Yulan 352
Wang, Zhinning 1122
Wanji, Samuel 140, **384**, 1156
Wannemuehler, Kathleen 16, 99
Wanzira, Humphrey 729, 944, 1050
Ward, Brian J. 483, 1227
Ward, Stephen A. 340, 584, 764, 989, 991, 1029, 1024
Ware, Lisa 25, 646, 647, 1036
Warhurst, David C. 346
Warikar, N. 796
Wasson, Peggy 189
Watany, N. 847
Watcharapichat, Pochaman 801
Waterman, Stephen 57
Waters, Norman 983
Watkins de Jong, Laurel **669**
Wattanavijitkul, . **851**
Watts, Douglas M. 318, 1128
Weaver, Scott C. 9, 318
Weber, Ingrid B. **419**
Webster, Bonnie L. 296
Webster, Jayne 572
Webster, Joanne P. 308, 329, 334, 752
Wei-Mei, Ching 272
Weil, Gary J. 92, 131, 427, 429, 433, 517, 520, 522, 1112, 1113, **1115**
Weill, Mylène 765
Weina, Peter J. 182, 183, 185, 186, 555, 763, 925, 1207
Weinberg, J. Brice 1194
Weinger, Merri 16
Weinkopff, Tiffany S. **432**
Weiss, Greta 220, **325**, 620, 621, 623
Weiss, Walter 1046
Wellems, Thomas E. 774
Wellington, Sun 886
Wen, Tzai-Hung 492, 496
Werbovets, Karl 540
Were, Tom **339**, 371, 640, 936, 937, 1022, 1230
Were, Vincent 106
Wesson, Dawn M. 255, 509, 510, 843, 849, 907, 1083, 1090, 1097
West, Mark **845**
Westerman, Richard 758
White, Bradley J. **679**, 1075
White, Nicholas J. 188, 633, 859
Whitten, Miranda M. A. 1069
Whittington, Jessica 2
Whitty, Christopher J. M. 31, 84, 377
Wibowo, Heri 1113
Wicaksana, B. 708
Widdowson, Marc-Alain 98
Widjaja, Susanna 13, 896
Widman, Douglas G. 499, **807**
Wiegand, Roger 406, 578, 579, 582, 772, 977, 1078, 1211
Wierzba, Thomas F. 426, 802
Wiggan, O'Neil 493
Wijaya, S. 708
Wikel, Stephen K. 258, 1172
Wilairatana, Polrat 873, 873
Wiley, Michael R. **321**, 1163
Wilhite, Kara 1130
Wilkins, Patricia 440, 532, 864
Williams, Calvin **927**
Williams, Francis 7
Williams, Frank 1034
Williams, Gail M. 399, 403
Williams, Jeffrey F. **19**, **875**
Williams, Jack L. 643
Williams, Kimberly D. 1147
Williams, Katherine L. 45, 495
Williams, Martin 671
Williams, Maya 13, 426, 708, **716**, 896, 897, 1109
Williams, Steven A. 141, 432, 1112, 1115, 1154
Williams, Thomas 817
Williams-Blangero, Sarah 1147
Williamson, John 214, 332, 803, 1033
Willingham, A. Lee 38, **438**
Willingham III, Lee A. 37
Wills, Bridget 1224
Wilson, Danny 326
Wilson, Marianna 826
Wilson, Michael D. 223, 253
Wilson, Mary E. 160, 161, 350, 421, 916
Wilson, Mark L. 29, 996
Wilson, Nana 917
Wilson, Patrick T. **625**
Wilson, Shona **359**
Wilson, William C. 257
Winkelmann, Evandro R. **111**
Winstanley, Peter A. 584, 764
Winter, Rolf 760
Winthrop, Kevin L. 278
Wireko Brobby, N.A. 28
Wirth, Dyann F. 190, 349, 406, 578, 579, 582, 588, 597, 634, 772, 775, 977, 1078, 1211, 1212
Withers, Mark R. 969
Wittes, Janet 969
Wittlin, Sergio 974, 975
Witzig, Richard S. 858, 1014
Woehlbier, Ute 288, 1011
Woerdemann, Meike 1150
Wojcik, Richard 710
Wojno, Abbey 695
Wolfe, Nathan 531
Wölfel, Roman **310**, 494
Wolkon, Adam 212, 216
Wolofsky, Kayla T. **1214**
Won, Kimberly Y. 141, **1154**
Wondji, Charles **1215**
Wong, Edward 610
Wong, Jennifer 77
Wong, Jacklyn **1089**
Wong, Kimberly Y. 1113
Wongsrichanalai, Chansuda 599, 1119
Woodring, Joseph V. **270**
Woodson, Sara E. **831**
Wootton, Susan H. 375
Wortmann, Glenn W. 95, 544
Wring, Stephen A. 537, 1205
Wu, Bo 430, 515, **516**, **518**
Wu, Baolin 1007
Wu, Xiaobo 1208
Wu, Yimin 3, 22, 1043
Wylie, Blair J. **602**, 1006, 1008
Wynn, Willard W. 1058
Wysocki, Vicki H. 1136
-
- X**
- Xa, Nguyen X. 1051
Xi, Zhiyong 428, 1071
Xia, Annie 162
Xia, Ai **674**, 677
Xiang, Charlie 228
Xiao, Lihua 278, 282, **1140**
Xiao, Shu-Yuan 724
Xiao, Shuhua 1178
Xiavier, Karen 1140
Xie, Dongsheng 162
Xie, Lisa H. 184, **186**, **1207**
Xin, Lijun 560, 1197
Xiong, Xu 510
Xu, Xiyan X. 802
-
- Y**
- Yabsley, Michael J. 478, 551, **548**
Yakob, Laith W. **33**
Yaméogo, Laurent 1159
Yamo, Emmanuel O. 936, **937**
Yan, Guiyun 33, 603, 672, 1002
Yan, Zheng 110
Yang, Yu R. **399**, **403**
Yanni, Emad 461
Yarlett, Nigel 1205
Yaro, Alpha S. **249**
Yaro, Jean Baptiste 1017, 1031, 1041
Yartel, Anthony 477
Yartlet, Nigel 557
- Yasnot, Maria F. **943**
Yasunami, Michio 12, **893**
Yates, Matthew 509
Yates, Terry L. 713
Yattara, Oumar 987
Yau, Vincent 816
Yébakima, André 232, 1221
Yeboah-Antwi, Kojo 602, 1006, 1008
Yeh, Ching-Ming 568
Yeka, Adoke 395
Yellow-Duke, Archibong 472
Yeo, Kee Thai **651**
Yeo, Tsin W. 1183, 1194
Yi, Yong 520
Yin, Jing 1186, 1210
Yoder, Jonathan 1140
Yohannes, Ambachew Medhin 35, 216
Yohannes, Gideon 1003
Yohn, Christopher 215, 651
Yoo, Won Gi **291**, 292
Yoon, In-Kyu 125, 389
Yoonprakhon, Somkid 702
Yosaatmadja, Francisca 323
Yoshino, Timothy P. 754
Young, Stephen 1140
Young, Suzanna A. **64**
Youssouf, Kaboré 856
Yozwiak, Nathan 705
Yp-Tcha, Marie-Michèle 1221
Yu, K.S. 457, 851
Yu, Xin 275
Yumari Uzcátegui, Nathalie 317
Yusibov, Vidadi 356
Yusuf, Bidemi 174
Yuwono, Djoko 13, 896, 897
-
- Z**
- Zaidenberg, Mario 58
Zamalloa, Hernán 312
Zamora, Jorge 658
Zamora Perea, Elvira 766
Zamudio-Meza, Horacio **895**
Zanolari, Boris 170
Zanotto, Paolo M. A. 1106, 1165
Zapata, Angela C. 546
Zapata-Estrella, Hiatzy 566
Zarife, Maria Alice S. 902, 903
Zavaleta, Nelly 366
Zegarra, Raul 320
Zeng, Qiang 184
Zerihun, Mulat 1003
Zhan, Bin **815**
Zhang, Bo 806
Zhang, Jing **184**, 186, 1207
Zhang, Lixin 413
Zhang, Shuyi **159**
Zhang, Si-Ming **298**
Zhang, Xuebin 660
Zhang, Xing 670
Zhang, Yanling 3
Zhang, Y.K. 162

Zhang, Zhongsheng 977
Zhao, Dazhi 565
Zheng, Qiang 1207
Zhong, Daibin 1002
Zhou, Ainong 1015
Zhou, Guoli **656**
Zhou, Hong 4, 5, 652
Zhou, Huchen 162
Zhou, Huayun 245
Zhu, Daming 22, **1047**
Zhu, Guoding **245**
Zhu, Jinsong **670**
Zhu, Xiaohua **540**
Zhuang, Shijie 207, 250
Ziegler, Sarah A. **724**
Zielinski-Gutierrez, Emily 57
Zimmerman, Dominica 717
Zimmerman, Dan 1018
Zimmerman, Peter A. 607, 996,
1158
Zink, Rebecca 519, **521**
Zinyowera, Sekesai 342
Zongo, Issaka **985**
Zou, Zhen **1174**, 1199
Zuluaga, Lina 981
Zunt, Joseph R. 1102, 1129
Zwang, Julien 952

