utmb Health
Institute for Human Infections & Immunity
Update

Issue 7 June 2013

Message from the Director

In the face of a very tough extramural research funding climate, infectious disease research and training continues to thrive here at UTMB. Our infectious disease faculty continue to succeed in obtaining new grants and contracts as listed below. In addition, the Provost has approved more pilot funding for IHII constituent components than in most recent years, allowing the IHII and CBEID to continue their pilot grant programs and the SCVD to continue offering predoctoral fellowships. McLaughlin Predoctoral and Postdoctoral Fellowship applications will be reviewed in July and we anticipate increasing the number of fellows supported for FY2014. The recently begun search for a new chair for the Department of Pathology represents an opportunity to extend our research programs in new directions and the recruitment of a new Vice President for Research offers the promise of better coordination and integration of our research programs with other strong foci on campus. If you know of individuals whom we should consider for these positions, do not hesitate to contact me (I am on both search committees.)

In This Issue

Message from the Director	1
IHII Pilot Grants	1
CBEID	3
WRCE	4
CTD	6
SCVD	7
BS2	10
Funding News	10
ID Trainee Publications	12

The next IHII retreat has been scheduled for 5-6 December, 2013; details will be forthcoming with the keynote speaker invitation pending now. We will be making some changes to the format to enhance strategic discussions among our faculty. If you did not complete the survey after last year's retreat and have suggestions, please do not hesitate to contact me or any other IHII Executive Committee member: Christine Arcari, Alan Barrett, Allan Brasier, James LeDuc, Andrew McNees, Peter Melby, Fred Murphy, David Niesel, Lynn Soong, Robert Tesh, David Walker and Clinton White.

Scott Weaver, PhD
Director, IHII

IHII Pilot Grants

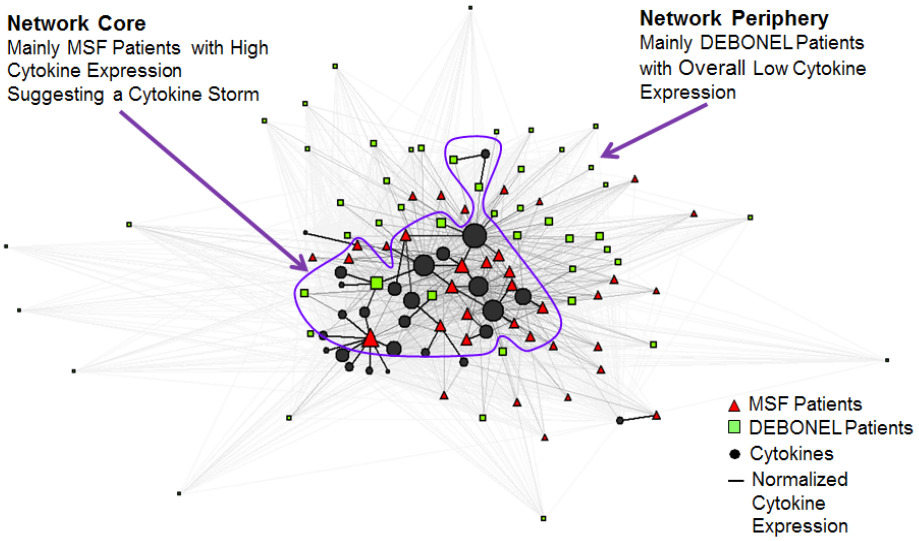
Applications Open for Fiscal Year 2014

The Institute for Human Infections & Immunity is now accepting applications for FY14 pilot grants. The purpose of the pilot grant program is to stimulate the development of new research initiatives in strategic areas of infectious disease and immunology designed to exploit new opportunities and strengthen overall IHII programs and goals. This year we are targeting proposal topics that build our capacity to compete for major funding initiatives available now or anticipated from the NIH or that exploit new technologies available on our campus. Proposals that focus on one or more of the following strategic areas are especially encouraged: (1) Studies of host-pathogen (or -vector for arthropod-borne pathogens) interactions that exploit new "omics" technologies and systems biology; (2) International collaborative research on tropical and emerging infectious diseases; (3) Novel imaging technologies for studies of microbial pathogenesis and structures; and (4) Pathogen genomics.

Further details and application instructions are available on the IHII website. This year's submission deadline is July 10, 2013. Questions regarding the preparation of your application should be directed to Andrew McNees, PhD.

IHII-Funded Research Receives Distinguished Paper Award

Suresh Bhavnani, PhD, Associate Professor of Biomedical Informatics at UTMB's Institute for Translational Science (ITS), and his team recently received a Distinguished Paper Award in Translational Bioinformatics (TBI). This award was given to the top five peer-reviewed papers presented at the 2013 Translational Bioinformatics Summit organized by the American Medical Informatics Association (AMIA), the primary organization for biomedical and health informatics in the US.



Bipartite network analysis of rickettsioses patients and cytokines

While bioinformatics research generally focuses on the analysis of molecular data, translational bioinformatics focuses on the integrated analysis of molecular and clinical data, with the goal of accelerating the transformation of basic discoveries into therapeutics. Furthermore, this emerging field places as much emphasis on molecular and clinical discoveries as it does on developing general computational methods that are applicable to a wide range of research questions.

Suresh Bhavnani, PhD

The award-winning paper, "How Cytokines Co-occur across Rickettsioses Patients: From Bipartite Visual Analytics to Mechanistic Inferences of a Cytokine Storm," was co-authored by an interdisciplinary research team including **Juan Olano**, **Bi-Hung Peng**, **Justin Drake** and **Bryant Dang** from UTMB, Shyam Visweswaran from the University of Pittsburgh, Gowtham Bellala from HP Labs, and Jose Antonio Oteo and Paula Santibañez-Saenz from the Centro de Investigación Biomédica de La Rioja in Spain.

The paper describes the use of bipartite networks to analyze patients with *Rickettsia*, a class of bacteria transmitted to humans through the bite of infected arthropods such as ticks, lice, fleas, mites and chiggers. A subset of humans has severe reactions to such infections, leading to endothelial leakage and mortality if untreated. However, despite the worldwide emergence and re-emergence of several rickettsial diseases, little is known about the pathways triggered during severe human rickettsial infections, mainly because most studies have either focused on mouse models or used univariate methods that analyze one variable at a time.

As shown in the figure, the authors used bipartite networks to analyze the multivariate relationship between candidate cytokines (circles) and patients (triangles and squares). This approach helped to narrow down the possible biological pathways implicated in severe rickettsial infections (triangles in the network core), which is an important step toward identifying effective therapeutics for the disease. Furthermore, because the data suggested that some cytokines had significantly higher expression (also referred to as a cytokine storm) in a subset of patients, the paper proposed a general graph-based method to analyze such phenomena across a wide range of infectious diseases. They are also developing a new algorithm that can be used to analyze "big data" consisting of thousands of patients and molecular measurements.

The research was funded by a pilot grant from IHII, and by the UTMB CTSA. For more information, please visit the DIVA Lab website at skbhavnani.com/DIVA

Center for Biodefense & Emerging Infectious Diseases (CBEID)

The Infectious Diseases and Immunity Colloquium Series

The Center for Biodefense and Emerging Infectious Diseases (CBEID) co-hosted this year's Infectious Diseases and Immunity Colloquium series with the Center for Tropical Diseases and the Department of Microbiology & Immunology. Invited experts gave one-hour lectures and met with faculty and students during their visits. Although the current series ends in May, we are inviting speakers for the coming academic year. Once the FY14 calendar is set, the schedule and speakers will be sent via email and posted on the UTMB Daily Announcements. Lectures will take place **at noon on Tuesdays in BSB 2.122**. All trainees and faculty are encouraged to attend these lectures in which the most current infectious disease research is presented and perspectives on immune mechanisms are shared.

Pathology Research Day

On May 7, the Department of Pathology held its 19th Annual Research Day in Levin Hall, which provided an opportunity for postdoctoral fellows, graduate students, residents, visiting scientists, international students and technicians to present their outstanding research to the UTMB community via a poster session. Sixty posters were judged by faculty members and 19 monetary awards were awarded in honor of Robert Harrison, MD, and Edward S. Reynolds, MD. The CBEID contributed funds for the awards, as did the Department of Pathology and numerous faculty. The following individuals were recognized for their meritorious research:

Edward S. Reynolds Award

Graduate Students:
- Olga Kolokoltsova
- Michael Patterson
- Kenneth Plante
- Sydney Ramirez
- Alexey Seregin
- Thomas Shelite
- Stephan Willias

Residents:
- Tahereh Dadfarnia
- Michelle Foshat
- Lorna Ogden

Robert L. Harrison Award

Postdoctoral fellows:
- Rubing Chen
- Paige Dunphy
- Birte Kalveram
- Felix Santiago
- Vanessa Vasquez

Visiting scientists, international students, and technical staff:
- Adriana Diaz-Quinones
- Shakuntala Kondraganti
- Tian Luo
- Nicole Mendell

2013 Research Day awardees, from left: Tian Luo, Paige Dunphy, Stephan Willias, Rubing Chen, Olga Kolokoltsova, Alexey Seregin, Tom Shelite, Michael Patterson, Felix Santiago, Nicole Mendell, Sydney Ramirez, Birte Kalveram, Kenneth Plante, Shakuntala Kondraganti, Vanessa Vasquez, Lorna Ogden, and Adriana Diaz-Quinones. ***Not pictured:*** Tahereh Dadfarnia and Michelle Foshat.

In addition, **Dr. Nisha Garg** was honored as the Researcher of the Year and gave a talk on "Cross-talk of Parasite and Host Mitochondria in Inflammatory Chagasic Cardiomyopathy." **Dr. Judy Aronson** was recognized by the Experimental Pathology Graduate Student Association for her excellence in graduate teaching and mentoring.

Request for Proposals: CBEID Pilot/Feasibility Projects

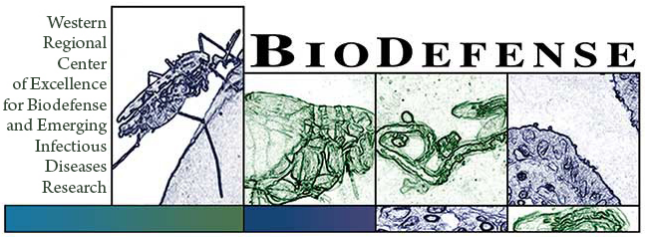
Pre-proposal deadline (not required): July 8, 2013
Application deadline: **Thursday, August 1, 2013**

The Center for Biodefense and Emerging Infectious Diseases (CBEID) invites applications for Pilot/Feasibility Projects. Funding for these project(s) is expected to begin on September 1, 2013. The total cost for the award is $50,000 or less for one year. The objective of the Pilot/Feasibility Projects is to support infectious disease research that allows a candidate to generate preliminary data, thereby leading to competitive research proposals that have a high likelihood of being funded by extramural sources. Projects must involve agents related to emerging infectious diseases and biodefense (see List of NIAID Emerging and Re-emerging Diseases). Proposals may involve basic science or translational research. New as well

as established UTMB investigators are encouraged to submit highly innovative proposals that are likely to lead to NIH or foundation funding.

Please share this funding opportunity with your colleagues. Contact Kimberly Schuenke (kischuen@utmb.edu) for details regarding this award, or questions regarding submission of preliminary ideas for consideration (pre-proposal). The CBEID office will provide the funding announcement and associated forms upon request; call x72464 or contact Angela Culler at anculler@utmb.edu.

WRCE Update



This is the final grant year for the Western Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research (WRCE), and researchers and CBEID staff were busy submitting U19 grant applications for Centers of Excellence for Translational Research (CETR) in March. The CETR program is designed to build upon the research and accomplishments of the RCE Program and to enhance ongoing product development activities. Applications will be reviewed in September, with funding decisions expected this fall.

Dr. Kent Peters, the current WRCE Program Officer, is resigning from the NIAID effective May 20 to accept a new position with the Department of Energy. Dr. Mike Schaefer will serve as the WRCE Program Officer.

The WRCE annual meeting will be held at UTMB's Open Gates on October 22nd and 23rd. Emails regarding the agenda and other details will be sent out in a few weeks.

WRCE RESEARCHER SPOTLIGHT: Patricia Aguilar, PhD

Dr. Patricia Aguilar was awarded a Career Development grant by the WRCE in March 2012 to study the recently isolated severe fever thrombocytopenia syndrome virus [SFTSV; X. J. Yu et al., Fever with thrombocytopenia associated with a novel bunyavirus in China. N Engl J Med 364, 1523 (Apr 21, 2011]. This novel bunyavirus was discovered in patient samples from China. Patients presented with fever, thrombocytopenia, and hemorrhagic manifestations. An initial case fatality rate of 12%-30% was reported and evidence of person-to-person transmission has also been documented. The exact mechanism by which this virus causes disease is still unknown. Dr. Aguilar and her colleagues have identified two viral proteins with the ability to block IFN responses. Her WRCE project is intended to further elucidate the role of these viral proteins in the evasion of host responses by SFTSV and determine their contribution to viral pathogenesis. Her work is expected to have an important positive impact in the bunyavirus field by providing critical insights into the molecular pathogenesis of this significant emerging human pathogen. Her research likely will have application to other related negative-sense RNA viruses, such as the novel emerging Heartland virus.

Dr. Aguilar has been involved in research on the epidemiology, genetics, and pathogenesis of a variety of different viral pathogens. She has carried out research on virus–host innate immunity interactions and has expertise with pathogenesis and virulence studies in mice and guinea pigs, and with reverse genetics systems of positive- and negative-sense RNA viruses. Her main research interest is to better understand the mechanisms that enable emerging viruses to evade host responses and cause disease. Viruses that are currently being investigated in her laboratory include encephalitic alphaviruses and bunyaviruses that cause hemorrhagic disease. She is also interested in identifying cellular factors that contribute to viral infection, which are potential targets for therapeutic interventions.

Dr. Aguilar obtained her BS in Pharmacy and Biochemistry at Universidad Nacional Mayor de San Marcos in Lima, Peru. She started her career as a research assistant at the US Naval Medical Research Center Detachment in Lima, and was heavily

involved in the passive surveillance for febrile illness in Peru. As part of this research effort, several arboviruses were isolated and identified as the cause of human illness. The public health and potential biodefense importance of these viruses motivated Dr. Aguilar to pursue a career in biomedical research to contribute toward the development of treatment and prevention measures for the associated diseases. She came to UTMB in 1999 on a Fulbright Scholarship and an Encyclopedia Britannica Scholarship to obtain a PhD in Virology in **Dr. Scott Weaver**'s laboratory. Her dissertation project was aimed at identifying phenotypic and/or genetic differences that could account for South American strains being less pathogenic for humans than North American strains. These studies identified important differences in interferon sensitivity among eastern equine encephalitis virus (EEEV) strains, and confirmed that persons living in endemic areas of EEEV transmission in South America were infected with EEEV but had no evidence of severe disease. In addition, by using reverse genetic analysis (construction of infectious clones and chimeric viruses), her studies revealed a better understanding of EEEV pathogenesis in humans. While at UTMB, she received a number of awards, including a Professional Enhancement Grant from the Fulbright Commission and a predoctoral McLaughlin Fellowship. In 2005, Dr. Aguilar relocated to New York City to do a postdoctoral fellowship in the laboratory of Dr. Christopher Basler at Mount Sinai School of Medicine, whose research interest is to better understand the mechanisms that enable viruses to evade innate immune response. While at Mount Sinai, Dr. Aguilar received a postdoctoral fellowship from the Northeast Biodefense Center to study the genetic determinants that confer interferon antagonism to EEEV. These studies were crucial in identifying a novel function of the EEEV capsid protein in viral pathogenesis. She also participated in the genetic reconstruction of the 1918 pandemic influenza virus.

Upon completion of her postdoctoral studies, Dr. Aguilar returned to Peru to work as a research scientist at the US Naval Medical Research Center Detachment (now NAMRU-6), the same institution where her passion for arboviruses began. At NAMRU-6, she continued to participate in the passive surveillance of febrile illness in Peru and was heavily engaged in arbovirus and influenza virus research, working closely with health authorities from the Peruvian Ministry of Health and General Directorate of Epidemiology.

Fortunately, Dr. Aguilar returned to UTMB in 2010 as an Assistant Professor in the Department of Pathology. She continues to work on arboviruses, and currently serves as a co-investigator of the World Reference Center for Emerging Viruses and Arboviruses.

Key publications by Dr. Aguilar and her colleagues include:

1. Juarez D, Long KC, Aguilar P, Kochel TJ, Halsey ES. Assessment of plaque assay methods for alphaviruses. Journal of Virological Methods, 2013. Jan;187(1):185-189. doi: 10.1016/j.jviromet.2012.09.026.
2. Venegas EA, Aguilar PV, Cruz C, Guevara C, Kochel TJ, Vargas J, Halsey ES. Ilheus virus infection in human, Bolivia. Emerging Infectious Diseases, 2012. 18(3):516-8. PMCID: PMC3309592.
3. Aguilar PV, Barrett AD, Saeed MF, Watts DM, Russell K, Guevara C, Ampuero JS, Suarez L, Cespedes M, Montgomery JM, Halsey ES, Kochel TJ. Iquitos virus: a novel reassortant Orthobunyavirus associated with human illness in Peru, 2011. PLoS Neglected Tropical Diseases, 201. Sep;5(9):e1315. doi: 10.1371/journal.pntd.0001315. PMCID: PMC3176741.
4. Aguilar PV, Camargo W, Vargas J, Guevara C, Roca Y, Felices V, Laguna-Torres VA, Tesh R, Ksiazek TG, Kochel TJ. Reemergence of Bolivian hemorrhagic fever: 2007-2008. Emerging Infectious Diseases, 15(9): 1526-1528. 2009. PMCID: PMC2819859.
5. Quiroz E, Aguilar PV, Cisneros J, Tesh RB, Weaver SC. Venezuelan equine encephalitis in Panama: Fatal endemic disease and genetic diversity of etiologic viral strains. PLoS Neglected Tropical Diseases, 2009. 3(6) e472. PMCID: PMC2697379.
6. Aguilar PV, Adams AP, Suárez V, Beingolea L, Vargas J, Manock S, Freire J, Espinoza WR, Felices V, Diaz A, Liang X, Roca Y, Weaver SC, Kochel TJ. Genetic characterization of Venezuelan equine encephalitis virus from Bolivia, Ecuador and Peru: Identification of a new subtype ID lineage. PLoS Neglected Tropical Diseases, 2009. Sep 15;3(9):e514. doi: 10.1371/journal.pntd.0000514. PMCID: PMC2734058.

7. Aiki-Raji C, Aguilar PV, Kwon YK, Goetz S, Suarez D, Jethra A, Nash O, Adeyefa C, Adu F, Swayne D, Basler CF. Phylogenetics and pathogenesis of early avian influenza viruses (H5N1), Nigeria. Emerging Infectious Diseases, 2008. 14(11): 1753-1755. PMCID: PMC2630749.
8. Yu X, Tsibane T, McGraw PA, House FS, Keefer CJ, Hicar MD, Tumpey TM, Pappas C, Perrone LA, Martinez O, Stevens J, Wilson IA, Aguilar PV, Altschuler EL, Basler CF, Crowe JE. Neutralizing antibodies derived from the B cells of 1918 influenza pandemic survivors. Nature, 2008. 455(7212): 532-536. PMCID: PMC2848880.
9. Aguilar PV, Leung LW, Wang E, Weaver SC, Basler CF. A five-amino-acid deletion of the eastern equine encephalitis virus capsid protein attenuates replication in mammalian systems but not in mosquito cells. Journal of Virology, 2008. 82(14):6972-83. PMCID: PMC2446984.
10. Tumpey TM, Basler CB, Aguilar PV, Zeng H, Solorzano A, Swayne DE, Cox NJ, Katz JM, Taubenberger JK, Palese P, Garcia-Sastre A. Characterization of the reconstructed 1918 Spanish influenza pandemic virus. Science, 2005. 310:77-80.

Center for Tropical Diseases (CTD)

CTD Postdoctoral Fellow – Dr. Rubing Chen

Rubing Chen, PhD, will complete a 2-year postdoctoral fellowship funded by the Center for Tropical Disease in August 2013. Dr. Chen's project, "The evolution of 3'UTR and its potential effect on host adaptation of Chikungunya virus," is focused on uncovering the genetic background that accounts for the arthropod-borne Chikungunya viral-host interaction, pathogenesis and transmission. Her current and future research plans include study of the evolution and biological importance of the 3'UTR of Arboviruses; the biological role of viral produced small RNAs in viral-mosquito interactions; and viral evolution and phylodynamics. She has six publications related to her work.

Fulbright Scholars Program – Dr. A. Clinton White

A. Clinton White, MD, Director of the Division of Infectious Diseases in Internal Medicine, was selected by the Fulbright Scholars Program in support of a teaching and research sabbatical in Peru. He is based at the Universidad Peruana Cayetano Heredia-UTMB collaborative research center in Cusco, Peru for 6 months. He is working with **Dr. Miguel Cabada**, director of the Center, who recently received an R01 grant from NIAID to study the impact of fascioliasis on children in the Cusco region. While in Peru, Dr. White is lecturing at the Universidad Nacional de San Antonio Abad de Cusco medical school, teaching in the Gorgas Course on Tropical Medicine and Travel Health in Lima, lecturing at the Peruvian Society for Infectious and Tropical Disease, and co-directing workshops on grant-writing. He will also co-direct a UTMB course in Field Epidemiology and supervise UTMB medical students on elective in Cusco. Dr. White noted, "The collaborative research center in Cusco provides UTMB with unique opportunities for global health research and education."

International Study Spotlight – Dr. Bruno Travi

Dr. Bruno Travi is directing first year medical student **Kevin Grabski** in a study on visceral leishmaniasis (VL) in Posadas City, Argentina, during the summer 2013. Kevin is working with a multidisciplinary research team that is surveying patients who were treated in the past for VL to determine their knowledge and practices regarding VL transmission, including actions to eliminate breeding places of sand fly vectors, and protecting dogs (the domestic reservoir). This project is part of a larger goal to understand the factors that led to the recent emergence of VL in northern Argentina.

Selected 2013 Publications by CTD Members

(For a more complete list of CTD members 2013 publications visit http://www.utmb.edu/ctd/Publications.aspx.)

1. **Vasilakis, N.; Forrester, N.L.**; Palacios, G.; Nasar, F.; Rossi, S.L.; **Wood, T.G**.; **Popov, P**.; Haddow, A.D.; Gorchakov, R.; Watts, D.M.; Guzman, H.; Travassos da Rosa, A.P.A.; **Weaver, S.C**.; Lipkin, I.W.; **Tesh, R.B**. Negevevirus – a new insect-specific taxon with a dispersed geographic distribution. J. Virol. 87:2475 – 2488; 2013
2. **Castellanos-Gonzalez A**, **White Jr AC**, Ojo KK, Vidadala RSR, Zhang Z, Reid MC, Fox AMW, Keyloun KR, Rivas K, Irani A, **Dann SM**, Fan E, Maly DJ, Van Voorhis WC. A novel Calcium Dependent Protein Kinase Inhibitor as a lead compound for treating Cryptosporidiosis. Journal Infectious Diseases. 2013 (In press)
3. Gupta S, **Garg NJ**. TcVac3 Induced Control of Trypanosoma **cruzi** Infection and Chronic Myocarditis in Mice. PLoS One. 2013;8(3):e59434. Epub 2013 Mar 26.
4. Tian B, Zhao Y, Kalita M, Edeh CB, **Paessler S**, **Casola A**, Teng MN, **Garofalo RP, Brasier AR**. CDK9-Dependent Transcriptional Elongation In The Innate ISG Response To RSV Infection In Airway Epithelial Cells. J Virol. 2013 Apr 17.
5. Tao P, Mahalingam M, Marasa BS, Zhang Z, **Chopra AK**, Rao VB. In vitro and in vivo delivery of genes and proteins using the bacteriophage T4 DNA packaging machine. Proc Natl Acad Sci U S A. 2013 Apr 9;110(15):5846-51. Epub 2013 Mar 25.
6. Liu H, Yao S, Dann SM, Qin H, Elson CO, **Cong Y**. ERK mitogen-activated protein kinase differentially regulates Th17- and Treg-cell development and contributes to the pathogenesis of colitis. Eur J Immunol. 2013 Apr 26. doi: 10.1002/eji.201242889.
7. Liu SY, Aliyari R, Chikere K, Li G, Marsden MD, Smith JK, Pernet O, Guo H, Nusbaum R, Zack JA, **Freiberg AN**, Su L, Lee B, Cheng G. Interferon-inducible cholesterol-25-hydroxylase broadly inhibits viral entry by production of 25-hydroxycholesterol. Immunity. 2013 Jan 24;38(1):92-105. doi: 10.1016/j.immuni.2012.11.005. Epub 2012 Dec 27.
8. Marzi A, Engelmann F, Feldmann F, Haberthur K, Shupert WL, Brining D, Scott DP, **Geisbert TW**, Kawaoka Y, Katze MG, Feldmann H, Messaoudi I. Antibodies are necessary for rVSV/ZEBOV-GP-mediated protection against lethal Ebola virus challenge in nonhuman primates. Proc Natl Acad Sci U S A. 2013 Jan 29;110(5):1893-8. doi: 10.1073/pnas.1209591110. Epub 2013 Jan 14.
9. **Paessler S**, **Walker DH**. Pathogenesis of the viral hemorrhagic fevers. Annu Rev Pathol. 2013 Jan 24;8:411-40. doi: 10.1146/annurev-pathol-020712-164041. Epub 2012 Nov 1. Review.
10. Hou L, Jie Z, Desai M, Liang Y, **Soong L**, **Wang T**, **Sun J**. Early IL-17 production by intrahepatic T cells is important for adaptive immune responses in viral hepatitis. J Immunol. 2013 Jan 15;190(2):621-9. doi: 10.4049/jimmunol.1201970. Epub 2012 Dec 10.
11. Soong L, Henard CA, Melby PC. Immunopathogenesis of non-healing American cutaneous leishmaniasis and progressive visceral leishmaniasis. Semin Immunopathol. 2012 Nov;34(6):735-51. doi: 10.1007/s00281-012-0350-8. Epub 2012 Oct 11. Review.

Sealy Center for Vaccine Development

SCVD Requests Applications from Graduate Students for FY14 Fellowships

The main purpose of the SCVD predoctoral fellowships is to support outstanding graduate students in the broad area of vaccinology. This may include:

- **Acute infectious diseases**
- **Chronic infectious diseases (e.g., HIV, tuberculosis, and parasitic)**
- **Chronic non-infectious diseases**

  We are particularly interested in research to develop vaccines for addiction (e.g., cocaine, methamphetamine, nicotine), atherosclerosis, autoimmune diseases (e.g., rheumatoid arthritis), cancer (with an emphasis on

hepatocellular carcinoma but also others [e.g., head and neck, anal cancer, and skin]), diabetes (insulin-dependent), neurodegeneration (e.g., Alzheimer's, Parkinson's).

We encourage applications involving co-mentorship between subject matter experts and faculty with ongoing vaccine development projects.

Applicants must submit proposals with the support of a mentor. The program is open to all current UTMB graduate students, regardless of Citizenship status. All students must have entered candidacy prior to the start of the funding period (September 1, 2013).

Detailed program and application submission information is available on the SCVD website at http://www.utmb.edu/scvd/edu/apps.shtml

Applications must be submitted no later than 4:00PM CST on Monday, July 22, 2013. Questions can be directed to Dr. Bridget E. Hawkins at (409) 747-8151 or behawkin@utmb.edu.

SCVD Co-Sponsors 13th Annual World Vaccine Congress

SCVD co-sponsored the 13th Annual World Vaccine Congress on April 16-18, 2013, in Washington, DC. This meeting attracted over 400 participants from industry, academia and government agencies. The SCVD had a booth there to promote UTMB and SCVD related activities and hand out educational materials. The booth was manned by **Andrew G McNees, PhD, MBA**, **Richard E Rupp, MD,** and **Bridget E Hawkins, PhD**, who also gave a talk titled "Vaccine development: From the bench to the bedside and beyond," which showcased the activities of the SCVD. **Alan DT Barrett, PhD,** gave a talk titled "Dengue vaccines: A landscape overview" and **David H Walker, MD,** chaired a session.

SCVD Sponsors Travel Awards for NFID's 16th Annual Conference on Vaccine Research

The National Foundation for Infectious Diseases (NFID) held their 16th Annual Conference on Vaccine Research, co-sponsored by SCVD, on April 22-24, in Baltimore, MD. This meeting attracted between 200 and 300 participants, including SCVD-sponsored trainees and faculty. SCVD held an abstract competition for travel awards to the conference in December and received many excellent applications from graduate students and postdoctoral scientists. **Andrew Beck**, a graduate student in **Dr. Alan Barrett's** laboratory, won a travel award to present his research, titled "Comparison of the live attenuated Yellow Fever Vaccine 17D-204 to its virulent parental strain Asibi by deep sequencing." He was selected to give an oral presentation, which was very well received by the audience. **Dr. Ashok Chopra's** graduate student **Christina Van Lier** was also awarded a travel award to present her research "Characterization of a Y. pestis double isogenic Δlpp/Δpla mutant in pneumonic and bubonic plague as a potential live-attenuated vaccine." The postdoctoral travel award went to **Dr. Michelle Meyer**, who works in **Dr. Alexander Bukreyev's** lab, and she presented her research titled "Aerosol vaccination against Ebola virus." Dr. Meyer was awarded the second prize (runner up) for the prestigious 2013 Annual Conference on Vaccine Research **Maurice Hilleman Early Stage Investigator Award.** UTMB postdoctoral trainees have been selected as runners-up for the Maurice Hilleman Early Stage Investigator Award in 2011 (**Dr. Birte Kalveram**) and 2013 (**Dr. Michelle Meyer**) and as winner of the award (**Dr. Olga Lihoradova**) in 2012**,** demonstrating the high quality of postdoctoral fellows at

Front row from left to right: Michelle Meyer, PhD; Eneida Male; Alan DT Barrett, PhD; Kwabena O Sarpong, MD, MPH; Nandadeva Lokugamage, PhD. ***Back row from left to right:*** Bridget E Hawkins, PhD; Christina J van Lier; Andrew Beck; David WC Beasley, PhD; Abbey B Berenson, MD, PhD; Richard E Rupp, MD.

UTMB.

Posters were also presented by other members of the SCVD:

Human Papillomavirus vaccine uptake among 18-26 year old low-income, multiethnic women.
AB Berenson, E Male, A Lee and M Rahman

Identification of EHEC-specific protective antigens using whole genome approach.
A Kalita, VA Garcia-Angulo, MK Kalita and **AG Torres**

Genetic stability of Rift Valley Fever virus MP-12 lacking NSs in Type-I interferon-incompetent Vero cells.
N Lokugamage and **T Ikegami**

Novel function of Sandfly Fever Sicilian virus NSs modifying host and viral gene expressions.
O Lihoradova, SV Indran and **T Ikegami**

SCVD Member and Professor, Departments of Pediatrics and Microbiology & Immunology, Richard Pyles, PhD


Rick Pyles, PhD

Dr. Richard Pyles recently received additional funding to evaluate additional compounds for Task order A07, Development of a diabetic mouse model for proof of concept testing (Project Director: **Richard Pyles, PhD**), under the Animal Models of Infectious Disease (AMoID) contract (PI: **Alan Barrett, PhD**). This new option will extend funding for this project until September 2014. Congrats Dr. Pyles!

Coming Soon

- SCVD will Co-sponsor and Exhibit at the 7th *Vaccine* and International Society for Vaccines (ISV) Congress this October 27-29 in Barcelona, Spain. SCVD is currently holding an abstract competition for travel awards to attend this meeting. Last day to submit abstracts to scvd@utmb.edu is **June 19, 2013**.
- SCVD will be sponsoring travel awards for the upcoming San Antonio Vaccine Development Center's 2nd Annual Vaccine Symposium, Vaccine Antigen Discovery and Vaccine-Induced Immunity, this November 15, 2013, at the University of Texas at San Antonio. Keep an eye on the hallway monitors for future announcements for the travel award competition!

SCVD's Clinical Trials Group Ongoing Clinical Trials

Some of the CTG's Current Clinical Trials:

Dengue Vaccine Study for 18-45 Year Olds
PURPOSE: Dengue fever is caused by infection with the dengue virus. The virus is transmitted from human to human by mosquitoes. Infection with a dengue virus can result in a range of symptoms, from subclinical disease to debilitating but transient dengue fever to life-threatening dengue hemorrhagic fever (DHF) to dengue shock syndrome (DSS). An estimated 36 million cases of dengue fever occur annually, which results in around 2.3 million cases of DHF and an estimated 20,000 deaths, primarily in children. Dengue is considered the most serious vector-borne disease in children, especially in countries in Southeast Asia, where more than 50% of all dengue cases and dengue related deaths occur in children below the age of 15 years. However, adults are also frequently at risk and, in some areas, have a greater incidence of disease than children. Mosquito control efforts in endemic areas have been ineffective in preventing dengue outbreaks or in preventing further geographical spread of the disease. Since World War II, the four dengue viruses have spread worldwide and are endemic in Asia, Central and South America including Colombia, the Caribbean, the Pacific Islands, and parts of Africa and Australia. Clearly, there is a need for a safe and effective vaccine that will protect against dengue infection. – ***Enrolling Now***

Rotavirus Vaccine Study for 2 Month Olds
PURPOSE: Both RotaTeq® and Rotarix® are licensed in the US, and it is expected that health care providers will admin-

ister both vaccines. A 3-dose regimen is recommended for RotaTeq® and a 2-dose regimen for Rotarix®. From previous experience, it is likely that one of the vaccines may become unavailable for some period or pediatric offices may switch from one vaccine to the other. Thus, it is probable that mixed schedules will be administered to infants. This study is designed to study mixed schedules of the 2 vaccines. ***– Enrolling Now***

Measles, Mumps, Rubella, Varicella Vaccine Study for 12-23 Month Olds
PURPOSE: A Phase III Double-Blind, Randomized, Multicenter, Controlled Study to Evaluate the Safety, Tolerability, and Immunogenicity of Measles, Mumps, Rubella, Varicella (MMRV) Vaccine Made with an Alternative Manufacturing Process (AMP) – ***Enrolling Now***

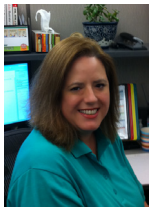
Herpes Zoster (Shingles) Vaccine Study
PURPOSE: The purpose of this study is to learn about the safety and effectiveness of an inactivated (not live) experimental herpes zoster vaccine in people with certain cancers. Zoster (HZ), or shingles, is a reactivation of the virus varicella which initially causes chickenpox. Following a chicken pox infection, the virus remains dormant in the nervous system until it reactivates, producing HZ. HZ is usually characterized by a painful, blistery skin rash. People with a lowered immune system have a higher chance of HZ, compared to the general population, and are at increased risk for developing severe and life-threatening complications. The only vaccine right now for shingles is a live vaccine and people who have lowered immune system should not take this vaccine. ***– Enrolling Now***

For more information about vaccine clinical trials, please contact the **SCVD's Clinical Trials Group** at (409) 772-5278 or scvd.ctg@utmb.edu or visit their website at: http://www.utmb.edu/scvd/clinTrial/index.shtml

Basic Science II Awards

Basic Science II (BS2), the administrative group that provides administrative and financial support for the Department of Microbiology & Immunology, Institute for Human Infections & Immunity (IHII), Sealy Center for Vaccine Development (SCVD) and the Galveston National Lab (GNL), recently instituted an employee recognition program and distributed its first awards. Awards are presented on a quarterly basis in each of the following four categories: customer service, innovation, leadership and teamwork. Award recipients, as determined by a rotating committee of administrative and financial staff, were:

Sonia Gonzalez
Sr. Financial Analyst
Leadership Award



Melissa Jones, MS
Administrative Coordinator
Customer Service Award
Innovation Award

Olga Kirby, MBA
Sr. Financial Analyst
Team Award

Please join us in congratulating Sonia, Melissa and Olga on their outstanding performance!

Recent Grants Awarded to IHII Faculty

The Institute for Human Infections & Immunity congratulates the following IHII faculty members on new funding awarded during the period of February 1 – June 13, 2013:

PI	Title	Sponsor	Award	Years	Amount
Aguilar, Patricia	Naturally Occurring Human Antibodies to Alphavirus Infection	Mount Sinai School of Medicine	R21	2	$ 94,478
Bukreyev, Alexander	ELII: Broadly Specific Needle-Free Vaccines against Emerging and Biothreat Viruses	NIAID	R01	1	$ 554,469

Bukreyev, Alexander	Human Monoclonal Antibodies Against Ebola and Marburg Virus	DOD via Vanderbilt University		4	
Casola, Antonella	Innate Immune Response to Human Metapneumovirus Infection	NIAID	R01	5	$ 355,955
Chopra, Ashok	Identification of New Antigens for a Plague Vaccine	NIAID	R01	5	$ 308,239
Chopra, Ashok	The Immunological Assessment of Samples from T4-phage Vaccinated Animals - Subaward 2	Catholic University of America	U01	5	$ 44,789
Enkhbaatar, Perenlei	Chemokine Modulator of Smoke Inhalation and Burn Injury	Radikal Therapeutics Incorporated	U01	3	$ 71,497
Freiberg, Alexander	Development of a Single-round Replicon-based Nipah Virus Vaccine Candidate	WRCE		1	$ 181,200
Freiberg, Alexander	Virus Inactivation	Texas Biomedical Research Institute		1	$ 995
Geisbert, Thomas	Efficacy of UV-5 and IHVR 19029 Against Marburg Virus Challenge in Guinea Pigs	Integrated BioTherepeutics Incorporated		1	$ 19,674
Geisbert, Thomas	EL II: P38 MAP Kinase Inhibitors as Therapeutics Targeting Ebolavirus Entry	Mount Sinai School of Medicine	R21	1	$ 51,068
Geisbert, Thomas	ELII: Filovirus Genes Preserved in Mammalian Genomes: Impact on Viral Replication	Mount Sinai School of Medicine		1	$ 76,500
Geisbert, Thomas	Development of an Immunoprotectant for Junin Virus Hemorrhagic Fever Viruses	Mapp Biopharmaceutical Inc		1	$ 8,624
Geisbert, Thomas	Advanced Development of a Multivalent Filovirus (Ebola/Marburg) Hemorrhagic Fever Vaccine	Crucell Holland B.V.		1	$ 416,263
Gelman, Benjamin	ELII: Texas NeuroAIDS Research Center	NIMH	U24	1	$1,179,094
Gelman, Benjamin	Integrated HIV DNA in CNS and deep body compartments	NIMH	R01	1	$ 270,375
Makino, Shinji	Analysis of Coronavirus-Host Cell Interactions	NIAID	R01	5	$ 344,250
McBride, Jere	ELII: Ehrlichia Type-1 Secreted Effectors Exploit Host SUMO Pathways	NIAID	R21	2	$ 420,750
Niesel, David	ELII: PREPing to a Biomedical PhD	NIGMS	R25	2	$ 348,438
Paessler, Slobodan	Recombinant life attenuated vaccine against Argentine hemorrhagic fever	NIAID	R01	5	$ 904,246
Paessler, Slobodan	Biodefense and Emerging Infectious Diseases (Project 7) - Stat 1 Modification for Antiviral Defense; Sub Award No. WU-12-254	Washington University in St. Louis	U54	5	$ 39,589
Paessler, Slobodan	Develop, evaluate, and compare four BSL2 VEEV alternative construct viruses with authentic virus	Army Medical Research Acquisition Activi		2	$ 301,867
Peterson, Johnny W	Stimulated Innate Resistance of the Lungs to Bioterror Pathogens	Texas A&M Health Science Center	U01	7	$ 52,886
Pierangeli, Silvia S	Antiphospholipid antibodies and lupus: new molecular targets for treatment	NIAMS	R01	5	$ 297,432
Soong, Lynn	ELII: Fifth World Congress of Leishmaniasis 2013	NIAID	R13	1	$ 6,000

Suzuki, Fujio	ELII: CCL 1 gene therapy to inhibit bacterial translocation in acute radiation syndromes	NIAID	U01	1	$ 521,570
Tang, Shao-Jun	ELII: Wnt signaling in glial activation during HIV-associated chronic pain pathogenesis	NINDS	R01	5	$ 382,500
Thangamani, Saravanan	Tick-Virus-Host interactions during Powassan virus transmission	National Research Fund for Tick-Borne Di		1	$ 60,000
Thirumalapura, Nagaraja	Immunity to Ehrlichial Infections	NIAID	K22	5	$ 108,000
Torres, Alfredo G	Long Polar Fimbriae of Attaching and Effacing Escherichia coli	NIAID	R01	5	$ 334,306
Walker, David H	Region VI Center for Biodefense and Emerging Infectious Diseases	NIAID	U54	5	$7,659,117
Weaver, Scott C	Characterization of Genetic Variability and Virulence Mechanisms of Venezuelan Equine Encephalitis Viruses	Lawrence Livermore National Security LLC		2	$ 127,296

ID Trainee Publication Highlights

The Lack of Maturation of Ebola Virus-Infected Dendritic Cells Results from the Cooperative Effect of at Least Two Viral Domains

Ndongala M Lubaki, **Philipp A. Ilinykh**, Colette Pietzsch, Bersabeh Tigabu, Alexander N. Freiberg, Richard A. Koup and Alexander Bukreyev. Journal of Virology. 2013. 87 (13): 7471-85

Ndongala Lubaki, PhD

Philipp Ilinykh, PhD

In this 2013 publication in the *Journal of Virology*, postdoctoral fellows in the department of pathology and co-first authors, **Dr. Ndongala M Lubaki** and **Dr. Philipp A. Ilinykh**, and colleagues investigated the contributions of Ebola virus (EBOV) proteins in the modulation of dendritic cells (DC) maturation by generating recombinant viruses expressing enhanced green fluorescent protein and carrying single amino acid mutations within several potentially immunomodulating domains within the envelope glycoprotein (GP) and the innate response antagonist domains (IRADs) located in VP24 and VP35. DC were infected with these viruses and DC maturation was monitored. They found that EBOV GP by itself is a strong inducer of DC maturation and none of the functional domains in GP had a significant effect on DC maturation. In contrast, each of the viruses carrying mutations disabling any IRAD in VP35 and VP24 induced a dramatic upregulation of DC maturation markers suggesting that "the immune paralysis" observed during EBOV infection results from a cooperative effect of two or more individual IRADs located in in two different proteins of the virus, VP35 and VP24.

Dr. Lubaki received his MSc in biotechnology from Johns Hopkins University in Baltimore, MD, in 2000. He received his PhD from McGill University, Montreal, Canada, where he studied the correlates of protection from HIV disease progression in individuals in acute early infection. He joined **Dr. Alexander Bukreyev's** laboratory at UTMB in 2010 to study the mechanisms of T lymphocyte activation, proliferation and apoptosis in Ebola virus (EBOV) infections.

Dr. Ilinykh received his MS in molecular biology from Novosibirsk State University in 2005 and PhD in physiology from the Institute of Cytology and Genetics, Russia. He joined Dr. Alexander Bukreyev's laboratory at UTMB in 2010 as a postdoctoral fellow to study the immunopathogenesis and host immune response to filoviruses.

Toscana virus NSs protein promotes degradation of double-stranded RNA-dependent protein kinase


Birte Kalveram, PhD

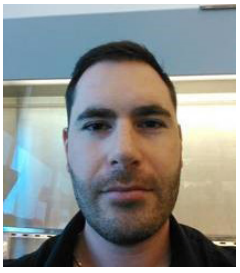
Birte Kalveram and Tetsuro Ikegami. Journal of Virology. 2013. 87: 3710-8.

In this 2013 publication in the *Journal of Virology*, Experimental Pathology postdoctoral fellow **Birte Kalveram, PhD**, and her mentor **Tetsuro Ikegami, PhD**, describe the discovery of a novel function of the Toscana virus (TOSV) virulence factor NSs. TOSV is a major etiologic agent of aseptic meningitis and encephalitis in the Mediterranean, and like other members of the genus Phlebovirus of the family Bunyaviridae, TOSV encodes a nonstructural protein (NSs) in its small RNA segment. Although the NSs protein of Rift Valley fever virus (RVFV) has been identified as an important virulence factor which suppresses host general transcription, inhibits transcription from the beta interferon promoter, and promotes the proteasomal degradation of double-stranded RNA-dependent protein kinase (PKR), little is known about the functions of NSs proteins encoded by less-pathogenic members of this genus. This study reports that TOSV is able to downregulate PKR with similar kinetics and efficiency as RVFV, while cellular transcription remains unaffected during TOSV infection. Furthermore, this study demonstrates that TOSV NSs is able to bind to PKR in infected cells and promote its proteasomal degradation. The discovery of this novel function of TOSV NSs will help understand the unique pathogenesis of TOSV infection in humans.

Dr. Kalveram received her PhD from the University of Constance in Germany where she studied the role of the cytokine-inducible ubiquitin-like modifier FAT10 in the immune response to intracellular pathogens. She is interested in understanding the complexity of host-pathogen interactions, particularly those of emerging viruses and their vertebrate hosts. Her current research in the laboratory of Dr. Tetsuro Ikegami focuses on elucidating the role of Bunyavirus NSs proteins in subverting innate and adaptive immune responses of the host.

Henipavirus Pathogenesis in Human Respiratory Epithelial Cells

Olivier Escaffre, Viktoriya Borisevich, J. Russ Carmical, Deborah Prusak, Joseph Prescott, Heinz Feldmann, Barry Rockx. Journal of Virology. 2013. 87(6):3284-94.


Olivier Escaffre, PhD

The henipaviruses Hendra (HeV) and Nipah (NiV) are zoonotic pathogens responsible for outbreaks in Australia and South-east Asia, respectively. Both viruses induce fatal lung infection and brain inflammation in humans and no vaccine or treatment is currently available. Most of the research regarding human henipavirus infection has focused on the neurological aspects of the disease they cause. However, the early steps of infection in the human respiratory tract and their potential roles in disease development remain unknown. Here, **Olivier Escaffre, PhD**, and colleagues investigate the ability for HeV and two NiV strains, isolated in Malaysia and Bangladesh, to infect human epithelial cells derived from the bronchi and the small airway. They showed that henipaviruses can efficiently infect these epithelial cells, suggesting they are early targets during natural human infection. In addition, henipavirus infection induced an inflammatory response, especially in cells derived from the small airway, which correlates with the extensive damage observed in human cases in that area of the lung. Finally, they report that NiV-Malaysia strain was more efficient in blocking a crucial innate immune response that usually puts the cells into an antiviral state and limits the infection. Our study provides new insights into the early steps of henipavirus infection in humans.

Dr. Escaffre received his BS and MS from Joseph Fourier University and his PhD from the European University of Brittany. He joined **Dr. Barry Rockx**'s laboratory at UTMB in 2011 as a Postdoc to work on the pathogenesis of risk group 4 agents. His previous experience focused on the understanding of the genomic packaging, the genetic reassortment as well as the pathogenesis of human and avian viruses from the *Orthomyxoviridae* and *Birnaviridae* family.