Scientific Think Tank:
Immunological Approaches to Sterilization of Dogs and Cats

Participants

Harini Bagavant, MBBS, PhD
Assistant Professor, Department of Medicine
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Dr. Harini Bagavant is an Assistant Professor in the Department of Medicine, Division of Nephrology and Center for Immunity, Inflammation, and Regenerative Medicine, at that University of Virginia School of Medicine. Dr. Bagavant obtained her M.B.B.S. degree from Government Medical College, Nagpur, India and her Ph.D. from the National Institute of Immunology, New Delhi, India. Her doctoral work was to investigate the potential of porcine zona pellucida proteins for immunocontraception. She then joined the Department of Pathology at the University of Virginia for post-doctoral studies on zona pellucida peptide vaccine development and ovarian autoimmune disease. This work was supported by a Fogarty Foundation training fellowship to the Center for Recombinant Gamete Contraceptive Vaccinogens.

After a brief break in her professional career, Dr. Bagavant started working on murine models of systemic autoimmunity, specifically Systemic Lupus Erythematosus (SLE). The primary focus of her research is to investigate the pathogenesis of renal disease in lupus using murine models of spontaneous SLE and development of systems for targeted drug delivery to the renal glomeruli. Her research is currently supported by funding from National Institutes of Health and Alliance for Lupus Research. She was one of the recipients of the 2007 Department of Medicine Award for Excellence in Research. Dr. Bagavant has presented her research at different national and international meetings and has published in peer-reviewed journals.

Stephen Boyle, PhD (Meeting Co-Chair)
Professor of Microbiology, Department of Biomedical Sciences and Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech
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Stephen Boyle received a B.A. in Natural Sciences from Rutgers, The State University (New Jersey) and an MSc and PhD in Bacteriology from the University of Rhode Island. He has served as a faculty member in both medical and veterinary colleges and has trained

graduate students and postdoctoral fellows. He is currently the Director of the Center for Molecular Medicine and Infectious Diseases and a Professor of Microbiology in the Department of Biomedical Sciences and Pathobiology at the Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, Virginia. His principal research interests revolve around the application of recombinant DNA technology to vaccine development, particularly as applied to refinement of brucellosis vaccines and their use as platforms to protect against additional pathogens. In addition, he is collaborating with the National Wildlife Research Center (USDA) on the development of a GnRH based contraceptive vaccine for delivery to wildlife and feral species. He is a founding member of the Alliance for Contraception in Cats and Dogs and is serving as the chair of their scientific advisory board.

David A. Brake, PhD
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David received his BS in Biology from Muhlenberg College. Following receipt of a PhD in Microbiology & Immunology from Hahnemann Medical University (now Drexel College of Medicine) in malaria immunology, he completed a 3 yr NIH post-doctoral fellowship at SmithKline Beecham Pharmaceuticals in the field of HIV molecular genetics. He was subsequently employed as a research immunologist at SmithKline Beecham Animal Health for 5 years, followed by an additional 8 years at Pfizer Animal Health where he held several scientific and management positions of increasing responsibility in both Biological Discovery and Biological Development. During his private industry tenure, David worked on numerous new vaccines for companion animals, livestock, and poultry, and published scientific papers in the area of veterinary immunology, immunoparasitology and vaccinology. In 2004, he founded the U.S.-based vaccine consulting company, BioQuest Associates, LLC. David currently serves as a scientific consultant to the U.S. Department of Homeland Security Science and Technology, providing technical and project management expertise for several transboundary animal disease vaccine projects. He is a member of several DHS S&T scientific committees and serves on the technical steering committee for the USDA National Veterinary Stockpile. He also serves as a scientific consultant to a U.S. life science biotechnology enablement company. David resides in East Lyme, CT with his wife, 2 teenage sons, 2 cats and a rabbit.

Joyce Briggs, M.S.
President, Alliance for Contraception in Cat & Dogs (ACC&D)
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Briggs has been a leader in national animal welfare for over fifteen years, through top general management, marketing, development, program and public relations positions at national nonprofit organizations, and as a management consultant bridging nonprofits, corporations and communities. During her four and a half years as executive director of PetSmart Charities, the organization raised and distributed $23 million to the animal welfare cause, primarily to support local pet adoption and spay/neuter programs. Briggs developed and oversaw that grants program. With adoption centers in over 620 PetSmart stores, PetSmart Charities, working with over 2400 adoption

partners, found homes for over 1.2 million once-homeless pets in that time. Prior to working for PetSmart Charities, Briggs was senior director of marketing and PR for the American Humane Association. She also served on the national Board of Directors for the Delta Society for three years and is active with a regional coalition of animal shelters. Prior to working full-time in animal protection, Briggs held corporate positions for 15 years. Her career spans management positions with New York City advertising agencies, including Ogilvy & Mather, and marketing leadership positions with Nabisco, Nutri-System and the Franklin Mint. She holds a master's degree in advertising from Northwestern University. Briggs shares her home in Portland, Oregon, with her husband, daughter, two dogs, two hens, one cat and a fish.

Scott Coonrod, PhD
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Dr. Scott Coonrod is an Associate Professor of Epigenetics and Reproductive Biology at Cornell Universities' Baker Institute for Animal Health in Ithaca, New York. Prior to that, Scott was an Assistant Professor in the Department of Genetic Medicine at Weill Medical College of Cornell University in New York City. His primary areas of interest include oocyte maturation, fertilization, and preimplantation development. More recently Scott has become interested in the mechanisms of epigenetic regulation estrogen-responsive genes in breast cancer cells. He received his BS in Veterinary Physiology (1984), his MS in Reproduction (1991), and his PhD in Veterinary Physiology (1995) from Texas A&M University. Scott then did his postdoctoral research at the University of Virginia under Dr. John Herr in the Department of Cell Biology.

Roy Curtiss, III, PhD
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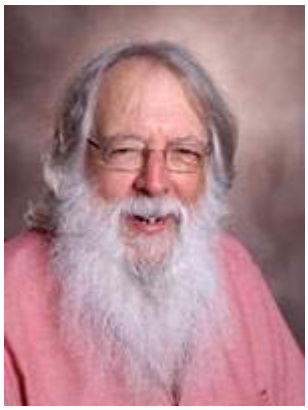

Roy Curtiss, III, PhD, is the director of the Center for Infectious Diseases and Vaccinology. He is a leader in exploring the genetic basis by which bacteria colonize invade and induce disease. Curtiss seeks to create vaccines that are safe and effective. Most recently his focus has been on the design, construction and evaluation of recombinant genetically modified *Salmonella* vaccine strains as immunizing vectors to deliver to deliver protective antigens could safely induce immunity in both humans and livestock.

Specifically, current endeavors are directed at developing vaccines to prevent infections by: *Streptococcus pneumoniae*, *Mycobacterium tuberculosis*, *Clostridium perfringens*, *Yersinia pestis*, enteric pathogens (such as *Salmonella, Escherichia, Shigella) Listeria monocytogenes*, hepatitis B virus, influenza viruses (human and avian) and *Eimeria* species.

In addition to his extensive knowledge of bacterial genetics, Curtiss has considerable expertise in avian plant and phage genetics. Curtiss' body of published work includes more than 250 reviewed articles. He has been issued numerous patents for his discoveries, including one for the use of recombinant avirulent *Salmonella*, *Escherichia* and *Salmonella-Escherichia* hybrids as antigen delivery vectors to induce mucosal, systemic and cellular immunity.

Before his time at ASU, Curtiss was the George William and Irene Keochig Freiberg professor of biology at Washington University where he chaired the Department of Biology from 1983-1993. In addition to his academic pursuits, Curtiss founded MEGAN Health Inc. where he served as a member of the board of directors until 2000.

Curtiss participates in a number of national and international activities and is a member of the American Society for Microbiology Finance Committee, a member of the National Academy of Sciences, and a member of the NIH Vaccine Research Study Section. Since 2000, Dr. Curtiss has chaired the Board of Executive Editors, *Escherichia coli & Salmonella*: Cellular and Molecular Biology, ASM Press.

Curtiss earned a BS from Cornell University and a PhD from the University of Chicago.

Gregg A. Dean, DVM, PhD
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Dr. Dean received his BS, DVM and PhD from Colorado State University. He also completed a clinical pathology residency at CSU and is a diplomate of the American College of Veterinary Pathologist. After two years as a post-doctoral fellow in the Department of Pathology in the School of Medicine at UC Davis he spent two years as a faculty research virologist in the School of Veterinary Medicine, also at Davis. In 1996 Dr. Dean accepted a position as a clinical pathologist at the College of Veterinary Medicine at North Carolina State University where he currently holds the rank of professor of immunopathology. After an international search Dr. Dean was appointed as Director for the Center of Comparative Medicine and Translational Research (CCMTR). The CCMTR is comprised of over 100 faculty from 5 different colleges at NC State that embrace the concept of 'one medicine' and seek to work in multidisciplinary teams to deliver solutions to veterinary and human patients. Dr. Dean's research is primarily focused on the immunopathogenesis of feline and human immunodeficiency virus, including vaccine development. He also investigates the mechanism of canine allergic and autoimmune diseases. He has been continuously funded by NIH since 1994 and has served on numerous study sections for NIH and other granting institutions.

Tamara Golden, PhD
Science Writer/Consultant
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After earning a BS with honors in Biochemistry from the University of Notre Dame, Tamara went on to earn her PhD in the Biochemistry Cellular and Molecular Biology program at the Johns Hopkins University School of Medicine, completed a postdoctoral position and worked for several years as a staff scientist at the Buck Institute, a non-profit research institute in the San Francisco bay area devoted to the research of aging and age-related disease.

Dr. Golden's research background focused on mitochondrial bioenergetics, and biochemical and gene expression changes related to oxidative stress and aging. She now writes about topics ranging from biochemical and molecular biological techniques, to diseases and disorders related to metabolism and aging.

Shirley Johnston, DVM, Ph.D., DACT
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Dr. Johnson was educated at the University of Washington, Seattle (BS Zoology, 1967), Washington State University, Pullman (DVM, 1974), and the University of Minnesota, St. Paul (PhD, Theriogenology, 1981). She is a diplomate of the American College of Theriogenologists (ACT), the veterinary specialty board for animal reproduction and served as ACT's first woman president.

Dr. Johnston's honors include the *Norden Award for Distinguished Teaching of Veterinary Medicine* (1984, 1988), the *Distinguished Service Award*, Association for Women Veterinarians (1992), and the *David E. Bartlett Award* from ACT. She is the senior author of Johnston SD, Root Kustritz MV, Olson PNS: *Canine and Feline Theriogenology*, WB Saunders Co., Philadelphia, 2001.

Dr. Johnston currently lives in Southern California, with her husband, Gary, a veterinary radiologist, their dog Kona, and cats Blinky and Brenda. Their son, Gary, is a teacher in Ho Chi Minh City, Vietnam and their daughter, Alison, is pursuing her PhD at the London School of Economics.

Julie Levy, DVM, PhD, DACVIM
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Dr. Julie Levy received her DVM from the University of California at Davis, completed an internship at Angell Memorial Animal Hospital, and a residency in small animal internal medicine at North Carolina State University. Levy is currently a professor in Maddie's Shelter Medicine Program in the College of Veterinary Medicine at the

University of Florida. Dr. Levy's research and clinical interests center on feline infectious diseases, neonatal kitten health, humane alternatives for cat population control, and immunocontraceptive vaccines for cats. She is the founder of two university-based feral cat spay/neuter programs that have sterilized more than 40,000 cats since 1994 (Operation Catnip). Dr. Levy's accomplishments include publication of more than 100 journal articles and textbook chapters. She is the recipient of the Carl J. Norden-Pfizer Distinguished Teacher Award, Outstanding Woman Veterinarian of the Year, and the European Society of Feline Medicine Award for Outstanding Contributions in the Field of Feline Medicine.

Colin R. Parrish, PhD
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Colin Parrish is the John M. Olin Professor of Virology at the Baker Institute for Animal Health, College of Veterinary Medicine of Cornell University. Dr. Parrish is a BSc (Hons.) graduate of Massey University in Palmerston North, New Zealand where he majored in Microbiology and Biochemistry. In 1984 Dr. Parrish was awarded his PhD in Virology from Cornell Ithaca, and that was followed by postdoctoral studies on flaviviruses at Monash University in Melbourne, Australia. Dr. Parrish has been on the faculty of Cornell's College of Veterinary Medicine since 1988. Among his academic roles was the organization and oversight of the Cornell DVM/PhD program from 2002 to 2008. He has trained 14 PhD candidates, and served as a advisor or supervisor for more than 40 students and postdoctoral fellow and trainees.

Dr. Parrish's research lab focuses on virology, virus structure and the evolution of host range by studying how viruses infect the cells of particular animals, and also how animals protect themselves against infection through the antibody responses. For the project on small animal contraception his laboratory has been studying the structure and function of the parvovirus capsid, and its reaction with antibodies. This may be used to develop specific reagents that can be used to display antigens of the reproductive proteins for enhancing various immune responses.

Beverly Purswell, DVM, PhD
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Dr. Beverly J. Purswell is a professor of theriogenology in the Department of Large Animal Clinical Sciences (DLACS) in the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech. She also served as interim head of the DLACS from 2004 to 2007. She received her DVM and her MS and PhD in immunology from the University of Georgia. She was an equine veterinarian in Clarkston, Georgia, immediately following graduation from

veterinary school. Dr. Purswell is board certified by the American College of Theriogenologists and currently serving on the examination committee for the A.C.T. She is a member of numerous professional organizations including the Southwest Virginia Veterinary Medical Association, the Virginia Veterinary Medical Association, the Society for Theriogenology, the American Veterinary Medical Association, the American Livestock Breeds Conservancy, and the American College of Theriogenologists. Dr. Purswell has served as president for the Southwest Virginia VMA, the Virginia VMA, and the Society for Theriogenology. She was chosen as the Virginia Veterinarian of the Year in 2004, and was the recipient of the Distinguished Alumni Award from the University of Georgia College of Veterinary Medicine in 2007.

Paul Christopher (Chris) Roberts, PhD
Associate Professor
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Dr. Chris Roberts received his BS degree in Biology from Davidson College in North Carolina in 1984. He subsequently obtained his MSc and PhD in Virology/Cell Biology at Philipps-Universität in Marburg, Germany in 1988 and 1992 respectively. He was a post-doctoral research fellow and senior research scientist at Emory University in Atlanta in the Department of Microbiology from 1992-1998. In 1999, he moved to Detroit, taking a position as assistant professor in the department of immunology and microbiology at Wayne State University School of Medicine. He subsequently moved to Virginia Tech in 2006, taking a position as Associate Professor. His laboratory has several focus areas: 1) viral vaccine development, 2) host pathogen interactions during viral:bacterial synergistic respiratory disease and 3) mechanisms of ovarian cancer immune evasion. He has served on the NIH Study Section for non-HIV anti-infectives, better known as Bugs and Drugs since 2005 and recently served as an ad hoc member for evaluation of the NIH funded National Centers for Excellence in Biodefense. He is the co-author of over 20 peer-reviewed articles and has been funded by the NIH and various private foundations since 1999. His research is currently supported by the National Institute of Aging (NIA) and National Cancer Institute (NCI).

John T. Schiller, PhD
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Dr. Schiller received his bachelor's degree in Molecular Biology from the University of Wisconsin, Madison in 1975, and his Masters and PhD degrees in Microbiology from the University of Washington, Seattle, in 1978, and 1982, respectively. He is currently the Chief of the Neoplastic Disease section of the Laboratory of Cellular Oncology, Center for Cancer Research, National Cancer Institute, Bethesda, MD. Prior to becoming a Senior Investigator in the NCI intramural program, he was a post-doctoral fellow, under the direction of Dr. Douglas Lowy, and then a Senior Staff Fellow in the same laboratory.

In more than 20 years at the NCI, Dr. Schiller has studied various aspects of papillomavirus molecular biology, immunology and epidemiology. The laboratory headed by Dr. Schiller and Dr. Lowy led in the initial discovery, development, and clinical testing of virus-like particle (VLP) vaccines to prevent the HPV infections that cause cervical cancer. His current interests include basic studies of papillomavirus virion assembly and infection, and the development of 2nd generation HPV vaccines, and the generation of virus-like display vaccines for other antigens.

Dr. Schiller has received numerous awards, most recently the 2007 Dorothy P. Landon-American Association of Cancer Researchers Prize for Translational Cancer Research, the 2007 American Medical Association's Dr. Nathan Davis Award for Outstanding Government Service, the 2007 Service To America Medal - Federal Employee of the Year, the 2007 Novartis Prize for Clinical Immunology, the 2008 Department of Health and Human Service's Hubert H. Humphrey Award for Service to America, and the 2008 Dermatology Foundation's Discovery Award.