Scientific Think Tank:
Gene Silencing Potential for Sterilization of Dogs and Cats

Participants

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.

Greg Dissen, Ph.D.
Staff Scientist, Oregon National Primate Research Center, Oregon Health and Science University
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Gregory Dissen received his doctorate in 1989 in Physiology of Reproduction. Graduate and postdoctoral training included work on all three components of the hypothalamic-pituitary-ovarian axis. His work has focused on the role of the neurotrophin family of growth factors in ovarian development and ovulation. An important second area of research has been the study of the role of a recently identified transcription factor called enhanced at puberty in the control of gonadotropin releasing hormone release in both rodents and non-human primates. He also directs the Lentiviral Vector Core at the ONPRC. He has more than 7 years experience working with the second and third generation lentiviral vector systems using both vectors for gene transfer and knockdown, using siRNA technology, for in vitro and in vivo use in both rodents and non-human primates. He is presently a co-investigator on a Found Animals Foundation project titled: Inducing stable infertility by RNA interference – proof-of-principal studies; where in nonpathogenic adeno-associated virus (AAV) will be tissue targeted to delivery siRNAs that will hopefully induce infertility.

Tamara Golden, Ph.D.
Science Writer/Consultant, Golden Tech Writing
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After earning a BS with honors in Biochemistry from the University of Notre Dame, Tamara went on to earn her Ph.D. in the BCMB program at Johns Hopkins University's School of Medicine.

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

Norman Hecht, Ph.D.
William Shippen Jr. Professor of Human Reproduction, Department of Obstetrics and Gynecology, Center for Research on Reproduction and Women's Health, University of Pennsylvania Medical Center
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The research interests of Norman B Hecht include:
- post-transcriptional regulation of mammalian spermatogenesis with a focus on proteins and RNA-protein complexes that control mRNA transport and stabilization
- creating mouse models to mimic and define the causes of human male infertilities
- development of non-hormonal male contraceptives
- defining the regulatory functions of small non-coding RNAs in male germ cells

John Herr, Ph.D.
Director, Center for Research in Contraceptive and Reproductive Health, University of Virginia
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Dr. Herr is a cell and developmental biologist with an interest in reproductive biology and contraceptive development. His laboratory at the University of Virginia Medical School works on the proteomics and genomics of spermiogenesis and oogenesis. The lab has recently identified several novel proteins unique to the sperm and to the oocyte and early embryo, and is interested in developing small molecule contraceptives to these proteins.

Dr. Herr is an active inventor having named more than 35 genes in the human genome and applied for patents on their use as diagnostic or therapeutic targets. In addition to basic science studies his laboratory conducts translational research with the intent of moving discoveries into products. For example, based on identification of a soluble testis specific biomarker, SP-10, found in the sperm acrosome, his laboratory recently developed the first FDA approved point-of-care immunodiagnostic test for detecting low numbers of sperm, SpermCheck Vasectomy, useful in monitoring declines in sperm count after vasectomy or in men using male contraceptives.

Dr. Herr attended Grinnell College and Stanford University as an undergraduate, received his PhD from the University of Iowa in 1978 and was a postdoctoral fellow at the University of Washington from '78-'81. Since '81 Dr Herr has been at Virginia where he is Professor of Cell Biology, Professor of Urology, Professor of Biomedical Engineering, founder and Director of the Lymphocyte Culture Center, and directs the Center for Research in Contraceptive and Reproductive Health. He is also program director for a postdoctoral program funded by the NIH Fogarty International Center that seeks bilateral cooperation and collaborations with Indian Scholars. He also serves as a member of the INDO-US Joint Working Group, a commission of scientists and governmental officials working to develop scientific exchange and development in India.

Carl Johnson, Ph.D.
Executive Director for Science, Hereditary Disease Foundation
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Carl received his B.S. from the University of Chicago (1970) and Ph.D. from the California Institute of Technology (1977) for genetic and biochemical studies of the nervous system of the nematode (round worm) Caenorhabditis elegans. He did postdoctoral research at the University of Wisconsin and, in 1986, joined Cambridge NeuroScience, Inc. as Director of Genetics. Carl, with H. Robert Horvitz, founded NemaPharm, Inc. in 1990. NemaPharm, the first company to focus exclusively on using model animals for human therapeutic discovery, was acquired by Sequana Therapeutics in 1997 and subsequently merged to form Axys Pharmaceuticals.Carl joined the Hereditary Disease Foundation as Executive Director of the Cure Huntington's Disease Initiative, or CHDI, in 2001. The Cure Huntington's Disease Initiative is a fast-track, virtual company strategy for accelerating drug discovery, testing, and development. In 2004, Carl became Executive Director for Science for the Hereditary Disease Foundation. As Executive Director, Carl is responsible for the overarching scientific vision and activities of the Hereditary Disease Foundation. This includes managing all aspects of the scientific programs of the Hereditary Disease Foundation. He directs the three annual meetings of the Science Advisory Board, interacting with applicants to ensure that their proposals go hand-in-hand with the mission of the Foundation. He also follows up after funds are granted to maximize the usefulness of the research expenditures for the Hereditary Disease Foundation and the grantee.Carl organizes and moderates all of the Hereditary Disease Foundation's unique interdisciplinary workshops, focused on the most cutting–edge scientific topics and questions. He also represents the Hereditary Disease Foundation in scientific interactions internationally.

Shirley Johnston, DVM, Ph.D., DACT
Director of Scientific Research, Found Animals Foundation
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Dr. Johnson was educated at the University of Washington, Seattle (B.S. Zoology, 1967), Washington State University, Pullman (D.V.M., 1974), and the University of Minnesota, St. Paul (Ph.D., 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 Ph.D. at the London School of Economics.

Michelle Kutzler, DVM, Ph.D.
Associate Professor of Theriogenology, Oregon State College of Veterinary Medicine
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Dr. Kutzler is a graduate from Washington State University College of Veterinary Medicine (1993). She worked in private practice in Minnesota for 4 years before going to Cornell to pursue residency and PhD training. She has been at Oregon State University College of Veterinary Medicine for the past 7 years, where she is an Associate Professor of Theriogenology. Her research interests are primarily in the field of large and small companion animal reproduction, with her current emphasis on the many applications of GnRH vaccination for intact and neutered dogs, cats, horses and camelids. Dr. Kutzler is married with three children and has two dogs, four llamas, two alpacas, three goldfish and one snake.

Dennis F. Lawler, DVM
Retired research veterinarian
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Dr. Dennis Lawler received his DVM degree from the University of Illinois, 1974. His research and clinical experience include work in animal reproduction, pediatric medicine, genetics, nutrition, population medicine, and the natural biology of animal populations. He is author of numerous publications in these areas.

Dr. Lawler provided health care for over two decades in colonies of dogs and cats numbering in total between 1400 and 2200. He was a co-principal investigator in a landmark study in which lifetime reduced energy intake was evaluated in dogs. This work has resulted in over 20 refereed publications. This study was the first of its kind to be completed in a larger mammal, allowing the benefits of long-term reduced energy intake in dogs to be compared to a considerable volume of similar research in other mammals and many species of invertebrates.

More recently, Dr. Lawler was part of an international research team of 24 scientists that explored the genetics of size in dogs. This project involved several scientific disciplines, and was headed by scientists at the National Institutes of Health. This group identified a single gene that codes for a growth factor (IGF-1) in dogs. This gene accounts for approximately 50% of the size variation among dog breeds of today. In the past, the genetics of size differentiation among dog breeds was thought to be far more complex. This work appeared in the journal Science in 2007.

Dr. Lawler's present research interests include biology of populations and evolutionary aspects of chronic diseases of aging.

Kevin Morris, Ph.D.
Director of Research, Animal Assistance Foundation
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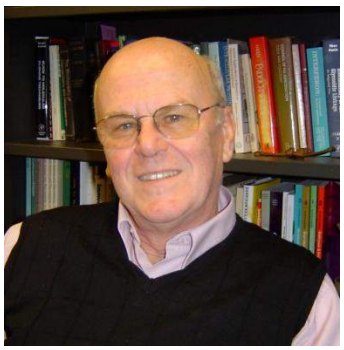
Dr. Morris holds a Ph.D. in Molecular Biology and Biochemistry from the University of Chicago. His research thesis focused on RNA-protein interactions in the ribosome. He worked as a postdoctoral fellow with Dr. Larry Gold at the University of Colorado from 1991 to 1993, with research emphasizing the development of RNA aptamers for catalysis and in vivo targeting applications. This work was further developed as a visiting professor at the University of Salzburg and as a consultant to NeXstar Pharmaceuticals. In 1999, he co-founded Sirius Medicine, a translational research and development company that generated new radiosurgical technologies for cancer treatment. The primary technology was successfully tested in FDA-approved clinical trials prior to purchase of the company in 2007. Dr. Morris joined the Animal Assistance Foundation in 2008, where he develops and analyzes animal welfare programs as the Director of Research.

R. Michael Roberts, Ph.D.
Curators' Professor of Animal Science and Biochemistry, University of Missouri



R Michael Roberts is a Curators' Professor at the University of Missouri, with appointments in Animal Sciences, Biochemistry and Veterinary Pathobiology. He is currently an investigator in the University of Missouri, Christopher S Bond Life Sciences Center. He gained his B.A. and D.Phil. in Plant Sciences from Oxford University, England, but since the mid 1970s has worked primarily as a reproductive biologist. Roberts' is best known for his work on uterine secretions, and particularly the iron-binding acid phosphatase, uteroferrin, in the pig, and on how the early embryo signals its presence to the mother in ruminant species through the production of small proteins called interferons. More recently, Roberts has been studying the role of other unique trophoblast proteins in pregnancy and has (with colleague Jon Green) developed a pregnancy test for cattle that is in the process of being commercialized. He is currently studying specification of trophoblast as it emerges from pluripotent cells, creating trophoblast stem cells by reprogramming differentiated somatic cells. Another project pertains to the role of maternal diet in regulating the sex of her offspring. His work is supported primarily through Federal Agencies such as the National Institutes of Health (NIH) and the United States Department of Agriculture (USDA), and also through Missouri State funds in support of agriculture.

Dr. Roberts has published over 270 papers in refereed scientific journals and over 70 reviews and chapters in books. He was elected to the National Academy of Sciences in 1996, and has received several international awards, including the Milstein Prize for Research on Interferons and the Wolf Prize for Agriculture (2003). Dr. Roberts also received the Carl G. Hartman Award (2006) from the Society for the Study of Reproduction. Roberts was Chief Scientist with the USDA's Competitive Grants Program (the National Research Initiative) from 1998-2000. He also served on the National Research Council's Committee that published recommendations to the Federal Drug Agency on concerns regarding the use of genetically modified animals for food (*Animal Biotechnology: Science Based Concerns*, National Academy of Sciences, Washington, D.C.) and chaired the NRC committee that investigated Animal Care & Management at the National Zoo.

John Rossi, Ph.D.
Dean, Chair and Professor, Molecular Biology, Associate Director for Laboratory Research, Co-leader, Cancer Biology Program, City of Hope's Irell & Manella Graduate School of Biological Sciences, Comprehensive Cancer Center

Dr. Rossi received his doctorate in microbial genetics from the University of Connecticut in Storrs. For postdoctoral training Dr. Rossi went to Brown University Medical School in Providence, Rhode Island where he trained under Dr. Arthur Landy studying the genomic structure, organization and expression of two gene clusters encoding tRNA-tyrosine in E. coli. This research led to the first observation that a tRNA gene cluster was co-transcribed with and subsequently processed from a mRNA. In 1980 Dr. Rossi moved to the Department of Molecular Genetics at the City of Hope in Duarte, California. Dr. Rossi's laboratory began to develop and test the idea of utilizing catalytic RNAs or ribozymes for inhibition of HIV infection. This research program has led to two clinical trials in which ribozyme genes have been transduced into hematopoietic stem cells for autologous transplant in HIV infected individuals. Work in the laboratory continues to focus upon enhancing the intracellular efficacy of ribozymes and RNA decoys via RNA trafficking and target co-localization approaches. At present a large percentage of the research effort of the lab is focused upon the biology and utilization of small interfering RNAs, or siRNA. This program has led to a first of its kind hematopoietic stem cell clinical trial using a triple gene therapy approach in AIDS/lymphoma patients.

Michael K. Skinner, Ph.D.
Professor, School of Molecular Biosciences, and Director, Center for Reproductive Biology, Washington State University

Dr. Michael Skinner is a professor in the School of Molecular Biosciences at Washington State University. He did his B.S. in chemistry at Reed College in Portland Oregon, his Ph.D, in biochemistry at Washington State University and his Postdoctoral Fellowship at the C.H. Best Institute at the University of Toronto. He has been on the faculty of Vanderbilt University and the University of California at San Francisco. Dr. Skinner's research is focused on the investigation of how different cell types in a tissue interact and communicate to regulate gonadal growth and differentiation, with emphasis in the area of reproductive biology. Recent studies have elucidated several critical events in the initiation of male sex differentiation, testis development and ovarian primordial follicle development. His current research has demonstrated the ability of endocrine disruptors to promote transgenerational epigenetic disease phenotypes due to abnormal germ line programming in gonadal development. Dr. Skinner has over 200 peer reviewed publications and has given over 180 invited symposia, plenary lectures and university seminars. Dr. Skinner established and was the Director of the Washington State University and University of Idaho Center for Reproductive Biology (CRB) since its inception in 1996. The CRB has over 90 faculty and is one of the largest reproductive sciences research Centers in the world. Dr. Skinner also established and was the Director of the Center for Integrated Biotechnology (CIB). The CIB was established in 2002 and has over 170 active research faculty members. In 2008 he stepped down as Director of the Centers to focus his efforts on his research. His research has been highlighted in BBC and PBS documentaries and selected as top 100 discoveries in 2005 and 2007 by Discover. Dr. Skinner has served on numerous journal editorial boards including, Epigenetics, the Journal of Andrology, Biology of Reproduction and Endocrinology, and as officer for several scientific societies. In addition, Dr Skinner has been actively involved with the start-up of several biotechnology companies. Email: skinner@wsu.edu