

ALEXANDER J. TRAVIS, V.M.D., Ph.D.
CURRICULUM VITAE

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Business Address:

Baker Institute for Animal Health
College of Veterinary Medicine, Cornell University
Hungerford Hill Road
Ithaca, New York 14853
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Current Position:

Cornell University:

11/2008-present Associate Professor of Reproductive Biology & Wildlife Conservation;
Faculty Director, Environment, Atkinson Center for a Sustainable Future;
Director of the Cornell Center for Wildlife Conservation
12/2002-2008 Assistant Professor of Reproductive Biology at the Baker Institute for
Animal Health, and the Department of Biomedical Sciences

Education and Training:

University of Pennsylvania:

2000-2002 Research Associate
1999-2000 Post-doctoral Fellow
Center for Research on Reproduction and Women's Health
mentor: Stuart B. Moss
1991-1999 Veterinary Medical Scientist Training Program (V.M.D./Ph.D.), NIH training
grant #5T32GM07170
Graduate Program in Cell & Molecular Biology: Ph.D. 1999, G.P.A. = 3.92
dissertation title: "Characterization, Targeting, and Functional Analyses of
Male Germ Cell-Specific Isoforms of Type I Hexokinase in the Mouse"
dissertation advisor: Gregory S. Kopf
School of Veterinary Medicine: V.M.D. 1995, G.P.A. = 3.89
externships: University of Florida Veterinary School
Fossil Rim Wildlife Center, Glen Rose, TX

Monash University, Australia:

1990 Diploma of Reproductive Science
mentors: Roger V. Short, F.R.C.V.S., Ph.D., currently Wexler
Professorial Fellow, Department of Perinatal Medicine, Royal
Women's Hospital, University of Melbourne
Marilyn B. Renfree, Ph.D., currently Professor of Reproductive and
Developmental Biology, and Department Head of Zoology,
University of Melbourne

Princeton University:

1985-1989 A.B. major-Ecology, Evolution and Behavior, G.P.A. = 3.59

Principal Investigator of Grants (current):

- 2009-2014 NIH, Pioneer Award 8DP1-EB016541 (originally 5DP1-OD-006431), “Nanoscale Energy Production for Implantable Medical Devices”
direct cost support: \$2,500,000 (currently in a no-cost extension)
- 2014-2015 SUNY Health Now Planning Grant, “Development of Hand-held Biosensors for Rapid Diagnosis and Study of Neural Disease and Neurotoxins”
direct cost support: \$150,000 (approximately \$40,000 to Travis lab)

Principal Investigator of Grants (pending):

Co-Investigator of Grants (pending):

Completed Grants (Principal Investigator):

- 2012-2014 CTSC Seed Funding Program (NIH, Weill), Pilot Award, “Developing a Multiplexed Point-of-Care Platform to Detect Multiple Stroke Biomarkers”
direct cost support: \$90,000
- 2012-2013 BioAccelerate NYC Prize, “Assay of sperm function to diagnose male infertility”
direct cost support: \$190,848 (approximately \$20,000 to Travis lab)
- 2009 NYSTAR, Center for Life Science Enterprise, CAT Award, “Production of Metabolic Energy for Implantable Medical NanoDevices”
direct cost support: \$50,000 (plus \$75,000 industrial match)
- 2009 Cornell Center for Vertebrate Genomics, “Modulation of $Ca_v2.3$ (α_{1E}) Calcium Channel Function by the Ganglioside G_{M1} : Investigations Using α_{1E} Null Mice
direct cost support: \$10,000
- 2007-2009 Morris Animal Foundation, D07ZO-097, “Analyzing the Function of Feline Sperm Produced by Testis Xenografting”
direct cost support: \$99,000
- 2006-2009 US AID, Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program (SANREM-CRSP) Award, “Developing A Participatory Socio-Economic Model For Food Security, Improved Rural Livelihoods, Watershed Management, & Biodiversity Conservation In Southern Africa”
direct cost support: \$1,083,005 (additional SANREM phase IV funds obtained to extend this project through September 2010)
- 2008-2009 New York State Department of Health, NYSTEM Grant for Institutional Development of Stem Cell Research Capabilities
PI: Alexander Y. Nikitin
direct cost support: \$26,730 (\$1,000,000 total)
- 2003-2009 NIH, NICHD, R01: HD045664, “Organization and Function of Lipid Rafts in Spermatozoa”
direct cost support: \$900,000
- 2006-2007 Cornell Feline Health Center, “Spermatogonial stem cell transplantation in the domestic cat: single sperm PCR to quantify efficacy”
direct cost support: \$10,070
- 2006-2007 Cornell/NYSTAR Center for Advanced Technology Innovation grant, “Scaffolded Nanoscale Cellular Energy Production”
direct cost support: \$50,000 funded by the Institute for Biotechnology and Life Science Technologies

- 2004-2006 Morris Animal Foundation, D04ZO-123 “Optimization of Testis Xenografting for the Preservation of Rare/Endangered Cats”
direct cost support: \$78,568
- 2005 US AID, SANREM-CRSP Planning Award, “Multi-Disciplinary Research to Optimize a Market-Driven Approach to Food Security, Improved Livelihoods, and Biodiversity Conservation in the Luangwa Valley Watershed Region in Zambia”
direct cost support: \$44,000
- 2005 Cornell Center for Vertebrate Genomics, “Preparation of Canine Embryonic Stem Cells”
direct cost support: \$14,000
- 2003-2004 Cornell Feline Health Center, “Optimization of spermatogonial stem cell transplantation in the domestic cat”
direct cost support: \$20,000
- 2000-2005 NIH, NCCR, section of Comparative Medicine, K01 RR00188 Special Emphasis Research Career Award (SERCA), “Signaling & Metabolic Roles of Glucose in Sperm Function”
direct cost support: \$545,832
- 2000 Andrew Mellon Foundation/CONRAD, Junior Investigator Award Gregory S. Kopf, mentor
“ β -Cyclodextrins as Novel, Non-Hormonal Contraceptive Agents”
direct cost support: \$360,000

Completed Grants (co-Investigator):

- 2009-2012 NIH, Challenge Grant, 1 RC1 HL100270-01, “Towards a Canine Model of Fanconi Anemia”
PI: Beverly Torok-Storb
direct cost support: \$194,805
- 2009-2010 New York State Department of Health, NYSTEM Grant: N08T-064
PI: Lisa A. Fortier
direct cost support: \$190,700 (no cost extension)

Restricted Gifts Received to Sponsor Research:

2007	Genex Cooperative, Inc.	\$5,000
2006	Genex Cooperative, Inc.	\$5,000
2005	Genex Cooperative, Inc.	\$5,000
2004	Genex Cooperative, Inc.	\$6,000

Honors and Awards:

Research:

- State University of New York Chancellor’s Award for Excellence in Scholarship and Creative Activities (2012)
- NIH Pioneer Award (2009-2014)
- Pfizer Animal Health Award for Research Excellence, Cornell University College of Veterinary Medicine (2006)
- Bayard T. Storey Prize for Excellence in Research, Center for Research on Reproduction and Women’s Health, University of Pennsylvania (2001)

Veterinary:

Graduated *summa cum laude*, University of Pennsylvania Leonard Pearson Prize (school's highest honor for student best representing both research and clinical veterinary medicine)

Pennsylvania Veterinary Foundation--Dr. A. Wayne Mountan Memorial Scholarship
Phi Zeta honorary society for veterinary research

Graduate: Isabel Mountain Scholar, Physiology Summer Course, Marine Biological Laboratories, Woods Hole, MA

United Imaging Corporation Scholarship for post-course research, Physiology Summer Course, MBL, Woods Hole, MA

Collegiate:

Graduated *magna cum laude*, Princeton University

Rotary International Graduate Fellowship (one year of international graduate study)

Patents:

- 2013 Utility patent application filed following PCT/US12/41886, "Immobilized Protein System for Rapid and Enhanced Multiplexed Diagnostics"
patent application # 14/125,221
- 2007 Patent application, "System for Production of Adenosine Triphosphate," originally entitled "Nano-scale localized energy production via scaffolded metabolic enzymes,"
[note: Full patent application published March 10, 2011. Multiple invention disclosures filed secondary to this IP]
patent application # US 2011/0059373 A1
- 2006 Full US patent: "Use of gangliosides as markers for lipid sub-domains in sperm: Applications for diagnosing male reproductive potential and assessing the effect of semen extenders and cryopreservation agents/protocols on sperm"
patent # 7,160,676 (Divisional 7,670,763 issued; CIP 12/714,858 pending; Canadian application 2,533,542 pending)

Businesses founded or co-founded:

Androvia, Inc. (C corp): This company was founded by Alexander Travis to translate our assay of sperm function into a diagnostic assay of male fertility. Mr. Michael Novinski is President and Chief Executive Officer, and Alexander Travis is Vice-President and Chief Scientific Officer.

InVivergy, LLC: This company was founded by Anthony Eisenhut of KensaGroup LLC to Commercialize specific technology coming from my laboratory.

Teaching:

Cornell University:

- 2014 Veterinary Medicine in Developing Nations (VetMed 6273) course co-organizer, 4 hours of lecture/discussion, 2 hours of panel discussion
Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 7 hours of lecture, 1 hour panel discussion, grading of papers
- 2013 Agriculture in Developing Nations (IARD 4020) 2 hours of lecture and discussion
Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
Current Concepts in Reproduction (BioAP 757), 1 lecture and writing and grading of exam questions

- Principles and Practices of Applied Wildlife Science (NTRES 428/628), 1 hour of lecture followed by discussion
- Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 7 hours of lecture, 2 hours panel discussion, grading of papers
- Smith-Kilborne Foreign Animal Disease Program, USDA-APHIS, 2 hours of lecture
- 2012 Food Systems for Poverty Reduction: Concepts and Themes (IARD 6040), 2 lectures
- Science and Technology Approaches to Problems in Human Health (BME 4110), 1 lecture and discussion
- Curriculum Design Group member, Foundation Course (Block) III
- Reproductive Biology Section Leader, Foundation Course (Block) III
- Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
- Conservation Medicine: A Veterinary Perspective (VETCS 1200), 2 hours of lecture
- Smith-Kilborne Foreign Animal Disease Program, USDA-APHIS, 2 hours of lecture
- Reptile and Amphibian Medicine and Surgery (VetMed 6554), 1 hour of lecture
- Case Studies in International Ecoagriculture and Environmental Conservation (IARD 4940) 1.25 hours of lecture and discussion
- Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 7 hours of lecture, 1 hour panel discussion, grading of papers
- Veterinary Medicine in Developing Nations (VetMed 6273) course co-organizer, 2 hours of lecture/discussion, 2 hours of panel discussion
- 2011 Food Systems for Poverty Reduction: Concepts and Themes (IARD 6040), 3 lectures
- Principles and Practices of Applied Wildlife Science (NTRES 428/628), 1 hour of lecture followed by discussion
- Current Concepts in Reproduction (BioAP 757), 1 lecture and writing and grading of exam questions
- Curriculum Design Group member, Foundation Course (Block) III
- Reproductive Biology Section Leader, Foundation Course (Block) III
- Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
- Conservation Medicine: A Veterinary Perspective (VETCS 1200), 2 hours of lecture
- Reptile and Amphibian Medicine and Surgery (VetMed 6554), 1 hour of lecture
- Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 6 hours of lecture, grading of papers
- Special Topics in Evolution and Ecology: Linking Biodiversity & Poverty Hotspots: Economic Drivers and Conservation Concerns (BIOEE 7600), 1 lecture
- 2010 Science and Technology Approaches to Problems in Human Health (BME 4110), 1 lecture and discussion
- Food Systems for Poverty Reduction: Concepts and Themes (IARD 6040), participated in design of this course and the NSF-IGERT-funded program, gave 3 lectures, grading of written reports
- Curriculum Design Group member, Foundation Course (Block) III
- Reproductive Biology Section Leader, Foundation Course (Block) III
- Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
- Reptile and Amphibian Medicine and Surgery (VetMed 6554), 1 hour of lecture
- Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 5 hours of lecture, grading of papers
- 2009 Future Faculty course, 1 lecture
- Curriculum Design Group member, Foundation Course (Block) III
- Reproductive Biology Section Leader, Foundation Course (Block) III

- Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
Current Concepts in Reproduction (BioAP 757), 1 lecture and writing and grading of exam questions
Principles and Practices of Applied Wildlife Science (NTRES 428/628), 1 hour of lecture followed by discussion
Reptile and Amphibian Medicine and Surgery (VetMed 6554), 1 hour of lecture
Conservation Medicine (VetMed 6735/754), course co-founder and organizer, 5 hours of lecture, grading of papers
- 2008 Curriculum Design Group member, Foundation Course (Block) III
Reproductive Biology Section Leader, Foundation Course (Block) III
Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
Conservation Medicine (VetMed 754), course co-founder and organizer, 5 hours of lecture, grading of papers
Veterinary Medicine in Developing Nations (VetMed 615), 2 hours of lecture, and 2 hours of panel discussion
Fertilization and the Early Embryo (BioGD 682), 2 hours of lecture
Reptile and Amphibian Medicine and Surgery (VetMed 726), 1 hour of lecture
- 2007 Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
Current Concepts in Reproduction (BioAP 757), 1 lecture and writing and grading of exam questions
Conservation Medicine (VetMed 754), course co-founder, 4.5 hours of lecture, grading of papers
Reptile and Amphibian Medicine and Surgery (VetMed 726), 1 hour of lecture
- 2006 Block IIIB, "Function and Dysfunction" Full tutoring load, 1 laboratory, 3 lectures, and writing and grading of exam questions
Fertilization and the Early Embryo (BioGD 682), 2 hours of lecture
Veterinary Medicine in Developing Nations (VetMed 615), 2 hours of lecture and discussion, and 1 hour of a panel discussion
Environmental Strategies (NTRSE 431), 2 hours of lecture and discussion
Reptile and Amphibian Medicine and Surgery (VetMed 726), 1 hour of lecture
Environmental and Resource Economics (AEM 250), 1 hour of lecture
- 2005 Block IIIB, "Function and Dysfunction" Full tutoring load, 2 laboratories, 2 lectures, and writing and grading of exam questions
Current Concepts in Reproduction (BioAP 757), 1 lecture and writing and grading of exam questions
- 2004 Block IIIB, "Function and Dysfunction" One week of tutoring, 1 lecture, and writing and grading of exam questions
Fertilization and the Early Embryo (BioGD 682), 2 hours of lecture
- 2003 Current Concepts in Reproduction (BioAP 757), 3 hours of lecture and writing and grading of exam questions

University of Pennsylvania School of Veterinary Medicine:

- 2001-2002 Developmental Biology: lecturer (2001-2002) and teaching assistant for laboratories (2001)
- 2001 Clinical Reproduction: lecturer on comparative reproduction and assisted reproductive technologies in non-traditional species
- 2000 Histology: teaching assistant for laboratories
- 1999-2001 Embryology: teaching assistant for laboratories

- 1997 Wildlife Medicine I and II: lecturer and instructor for wet labs in avian physical exam and emergency medicine
- 1996-1997 Embryology: teaching assistant for laboratories
Histology: teaching assistant for laboratories
Physical Exam: teaching assistant for laboratories

Peer Reviewed Publications:

- Cohen, R., Buttke, D.E., Asano, A., Nelson, J.L., Ren, D., Miller, R., Cohen-Kutner, M., Atlas, D., and **TRAVIS, A.J.** (2014) Lipid modulation of calcium flux through Cav2.3 regulates acrosome exocytosis and fertilization. *Developmental Cell*, 28:310-321.
- Gao, L., Giglio, K.M., Nelson, J.L., Sondermann, H., and **TRAVIS, A.J.** (2014) Ferromagnetic nanoparticles with peroxidase-like activity enhance the cleavage of biological macromolecules for biofilm elimination. *Nanoscale*, 6:2588-2593.
- Kim, B., Zhang, X. Kan, R., Cohen, R., Mukai, C., **TRAVIS, A.J.**, and Coonrod, S.A. (2014) The role of MATER in endoplasmic reticulum distribution and calcium homeostasis in mouse oocytes. *Developmental Biology*, 386:331-339.
- Asano, A., Nelson-Harrington, J.L., and **TRAVIS, A.J.** (2013) Membrane rafts regulate phospholipase B activation in murine sperm. *Communicative & Integrative Biology*, 6:6 e27362. (invited synthesis of Asano et al., 2013, *Journal of Biological Chemistry*).
- Asano, A., Nelson-Harrington, J.L., and **TRAVIS, A.J.** (2013) Phospholipase B is activated in response to sterol efflux and stimulates acrosome exocytosis in murine sperm. *Journal of Biological Chemistry*, 288:28104-28115.
- Kiso, W.K., Selvaraj, V., Nagashima, J., Asano, A., Brown, J.L., Schmitt, D. L., Leszyk, J., **TRAVIS, A.J.**, and Pukazhenth, B.S. (2013) Lactotransferrin in Asian elephant (*Elephas maximus*) seminal plasma correlates with semen quality. *PLoS ONE* 8(8): e71033. doi:10.1371/journal.pone.0071033.
- Harkey, M.A., Asano, A., Zoulas, M.E., Torok-Storb, B., Nagashima, J., and **TRAVIS, A.J.** (2013) Isolation, genetic manipulation, and transplantation of canine spermatogonial stem cells: Progress toward transgenesis through the male germ line. *Reproduction* 146: 75-90.
- Mukai, C., Gao, L., Bergkvist, M., Nelson, J.L., and **TRAVIS, A.J.** (2013) Biomimicry enhances sequential reactions of tethered glycolytic enzymes GAPDS and TPI. *PLoS ONE* 8:e61434.
- Gatere, L., Lehmann, J., DeGloria, S., Hobbs, P., Delve, R., and **TRAVIS, A.** (2013) One size does not fit all: Conservation farming success in Africa more dependent on management than on location. *Agriculture, Ecosystems and Environment*, 179: 200-207
- Mukai, C. and **TRAVIS, A.J.** (2012) What sperm can teach us about energy production. *Reproduction in Domestic Animals* Suppl 4:164-169.
- Kiso, W. K., Asano, A., **TRAVIS, A.J.**, Schmitt, D.L., Brown, J. L., and Pukazhenth, B. S. (2012) Pretreatment of Asian elephant (*Elephas maximus*) spermatozoa with cholesterol-loaded cyclodextrins and glycerol addition at 4°C improves cryosurvival. *Reproduction, Fertility and Development* 24:1134-1142.
- Barrett, C.B., **TRAVIS, A.J.**, and Dasgupta, P. (2011) On biodiversity conservation and poverty traps. *Proceedings of the National Academy of Sciences, USA*, 108:13907-13912.

- Lewis, D.*, Bell, S. Fay, J. Bothi, K., Gatere, L., Kabila, M., Mukamba, M., Matokwani, E., Mushimbalume, M., Moraru, C., Lehmann, J., Lassoie, J., Wolfe, D., Lee, D., Buck, L., and **TRAVIS, A.J.** (2011) Community Markets for Conservation (COMACO) links biodiversity conservation with sustainable improvements in livelihoods and food production. *Proceedings of the National Academy of Sciences, USA*, 108:13957-13962. *This article was chosen to provide the cover image for this issue, and was selected for Faculty of 1000 Prime (F1000P).
- Fortier, L.A. and **TRAVIS, A.J.** (2011) Stem Cells in Veterinary Medicine. *Stem Cell Research & Therapy* 2:9.
- Gourdon, J., Kim, Y. and **TRAVIS, A.J.** (2011) Production of sperm from ferret (*Mustela putorius furo*) testis xenografts. *Comparative Medicine* 61:145-149.
- Selvaraj, V. Asano, A., Page, J., Kumar, K., Foster, J. Nelson, J.L., Brenna, T., Weiss, R.S., and **TRAVIS, A.J.** (2010) Mice lacking FABP9/PERF15 develop sperm head abnormalities but are fertile. *Developmental Biology* 348:177-189.
- Asano, A., Nelson, J.L., Zhang, S., and **TRAVIS, A.J.** (2010) Characterization of the proteomes associating with three distinct membrane raft sub-types in murine sperm. *Proteomics* 10:3494-3505.
- Mukai, C.*, Bergkvist, M., Nelson, J.L., and **TRAVIS, A.J.** (2009) Sequential reactions of surface tethered glycolytic enzymes. *Chemistry and Biology* 16:1013-1020.*Featured Article (see also Hess, H. Reassembling biological machinery in vitro, *Chemistry and Biology* 16:917-918)
- TRAVIS, A.J.**, Kim, Y., Meyers-Wallen, V.N. (2009) Development of new stem cell-based technologies for carnivore reproduction research. *Reproduction in Domestic Animals* 44 Suppl. 2:22-28.
- Paduch, D.A., Bolyakov, A., Cohen, P., and **TRAVIS, A.J.** (2009) Reproduction in men with Klinefelter Syndrome—the past, the present, and the future. *Semin. Reprod. Med.* 27(2):137-148.
- Selvaraj, V., Asano, A., Buttke, D.E., Sengupta, P., Weiss, R.S., and **TRAVIS, A.J.** (2009). Mechanisms underlying the micron-scale segregation of sterols and G_{MI} in live mammalian sperm. *Journal of Cellular Physiology* 218:522-536.
- Asano, A., Selvaraj, V., Buttke, D.E., Nelson, J.L., and **TRAVIS, A.J.** (2009). Biochemical characterization of membrane fractions in murine sperm: Identification of three distinct sub-types of membrane rafts. *Journal of Cellular Physiology* 218:537-548.
- Kim, Y., Turner, D., Nelson, J.L., Dobrinski, I., McEntee, M., and **TRAVIS, A.J.** (2008). Production of donor-derived sperm after spermatogonial stem cell transplantation in the dog. *Reproduction* 136:823-831.
- Simpson, I.A, Dwyer, D., Malide, D., Moley, K.M., **TRAVIS, A.J.**, and Vannucci, S.J. (2008). The facilitative glucose transporter GLUT3: 20 years of distinction. *American Journal of Physiology: Endocrinology and Metabolism* 295:E242-E253.
- Brunner, S., Colman, D., **TRAVIS, A.J.**, Luhmann, U.F.O., Shi, W., Feil, S., Imsand, C., Nelson, J., Grimm, C., Ruelicke, T., Fundele, R., Neidhardt, J., and Berger, W. (2008) Overexpression of Rpgr leads to male infertility in mice due to defects in flagellar assembly. *Biology of Reproduction* 79:608-617.

- McPartlin, L.A., Littell, J. S., Mark, E.J., Nelson, J. L., **TRAVIS, A.J.**, and Bedford-Guaus, S.J. (2008). A defined medium supports changes consistent with capacitation in stallion sperm, as evidenced by increases in protein tyrosine phosphorylation and high rates of acrosomal exocytosis. *Theriogenology* 69:639-650.
- Kim, Y., **TRAVIS, A.J.**, and Meyers-Wallen, V.N. (2007). Parturition prediction and timing of canine pregnancy. *Theriogenology* 68:1177-1182.
- Kim, Y., Selvaraj, V., Pukazhenth, B., and **TRAVIS, A.J.** (2007). Effect of donor age on success of spermatogenesis in feline testis xenografts. *Reproduction, Fertility and Development* 19:869-876.
- Schlingmann, K., Michaut, M.A., McElwee, J.L., Wolff C.A., **TRAVIS, A.J.**, and Turner, R.M. (2007). Calmodulin and CaMKII in the sperm principal piece: Evidence for a motility-related calcium/calmodulin pathway. *Journal of Andrology* 28:706-716.
- Tikku, S., Epshtein, Y., Collins, H., **TRAVIS, A.J.**, Rothblat, G., and Levitan, I. (2007) Relationship between Kir2.1/Kir2.3 activity and their distributions between cholesterol-rich and cholesterol-poor membrane domains. *The American Journal of Physiology-Cell Physiology* 293:440-450.
- Dobrinski, I. and **TRAVIS, A.J.** (2007). Germ cell transplantation for the propagation of companion animals, non-domestic and endangered species. *Reproduction, Fertility and Development* 19:732-739.
- Selvaraj, V.* , Buttke, D.E.* , Asano, A., McElwee, J.L., Wolff, C.A., Nelson, J.L., Klaus, A.V., Hunnicutt, G.R., and **TRAVIS, A.J.** (2007). G_{MI} dynamics as a marker for membrane changes associated with the process of capacitation in murine and bovine spermatozoa. *Journal of Andrology* 28:588-599. *indicates equal contribution to this work.
- Buttke, D.E., Nelson, J.L., Schlegel, P.N., Hunnicutt, G.R., and **TRAVIS, A.J.** (2006). Visualization of G_{MI} with cholera toxin B in live epididymal versus ejaculated bull, mouse, and human spermatozoa. *Biology of Reproduction* 74:889-895.
- Pukazhenth, B., Comizzoli, P., **TRAVIS, A.J.**, and Wildt, D.E. (2006). Applications of emerging technologies to the study and conservation of threatened and endangered species. *Reproduction, Fertility and Development* 18:77-90.
- Selvaraj, V.* , Asano, A.* , Buttke, D.E., McElwee, J.L., Nelson, J.L., Wolff, C.A., Merdushev, T., Fornés, M.W., Cohen, A.W., Lisanti, M.P., Rothblat, G.H., Kopf, G.S., and **TRAVIS, A.J.** (2006). Segregation of micron-scale membrane sub-domains in live murine sperm. *Journal of Cellular Physiology*, 206:636-646. *indicates equal contribution to this work.
- Kim, Y., Selvaraj, V., Dobrinski, I., Lee, H., McEntee, M.C., and **TRAVIS, A.J.** (2006). Recipient preparation and mixed germ cell isolation for spermatogonial stem cell transplantation in domestic cats. *Journal of Andrology* 27:248-256.
- Romanenko, V.G., Fang, Y., Byfield, F., **TRAVIS, A.J.**, Vandenberg, C.A., Rothblat, G.H., and Levitan, I. (2004). Cholesterol sensitivity and lipid raft targeting of Kir 2.1 channels. *Biophysical Journal* 87:3850-3861.
- TRAVIS, A.J.**, Tutuncu, L., Jorgez, C.J., Ord, T., Jones, B.H., Kopf, G.S., and Williams, C.J. (2004). Requirements for glucose beyond sperm capacitation during *in vitro* fertilization in the mouse. *Biology of Reproduction* 71:139-145.

TRAVIS, A.J. and Kopf, G.S. (2002). The role of cholesterol efflux in regulating the fertilization potential of mammalian spermatozoa. *The Journal of Clinical Investigation* 110:731-736.

TRAVIS, A.J., Merdiushev, T., Vargas, L.A., Jones, B.H., Purdon, M.A., Nipper, R.W., Galatioto, J., Moss, S.B., Hunnicutt, G.R., and Kopf, G.S. (2001). Expression and localization of caveolin-1, and the presence of membrane rafts, in mouse and guinea pig spermatozoa. *Developmental Biology* 240:599-610.

TRAVIS, A.J., Jorgez, C.J., Merdiushev, T., Jones, B.H., Dess, D.M., Diaz-Cueto, L., Storey, B.T., Kopf, G.S., and Moss, S.B. (2001). Functional relationships between capacitation-dependent cell signaling and compartmentalized metabolic pathways in murine spermatozoa. *Journal of Biological Chemistry* 276:7630-7636.

TRAVIS, A.J. *, Sui, D. *, Riedel, K.D., Hofmann, N.R., Moss, S.B., Wilson, J.E., and Kopf, G.S. (1999). A novel NH₂-terminal, nonhydrophobic motif targets a male germ cell-specific hexokinase to the endoplasmic reticulum and plasma membrane. *Journal of Biological Chemistry* 274:34467-34475. *indicates equal contribution to this work.

Osheroff, J.E., Visconti, P.E., Valenzuela, J.P., **TRAVIS, A.J.**, Alvarez, J., and Kopf, G.S. (1999). Regulation of human sperm capacitation by a cholesterol efflux-stimulated signal transduction pathway leading to protein kinase A-mediated up-regulation of protein tyrosine phosphorylation. *Human Reproduction* 5:1017-1026.

TRAVIS, A.J., Foster, J.A., Rosenbaum, N.A., Visconti, P.E., Gerton, G.L., Kopf, G.S., and Moss, S.B. (1998). Targeting of a germ cell-specific type 1 hexokinase lacking a porin-binding domain to the mitochondria as well as to the head and fibrous sheath of murine spermatozoa. *Molecular Biology of the Cell* 9:263-276.

Visconti, P.E., Olds-Clarke, P., Moss, S.B., Kalab, P., **TRAVIS, A.J.**, de las Heras, M., and Kopf, G.S. (1996). Properties and localization of a tyrosine phosphorylated form of hexokinase in mouse sperm. *Molecular Reproduction and Development* 43:82-93.

Book Chapters:

TRAVIS, A.J. and Kopf, G.S., “The spermatozoon as machine: Compartmentalized metabolic and signaling pathways bridge cellular structure and function,” in *Assisted Reproductive Technology*, DeJonge, C. and Barratt, C.L.R., eds., Cambridge University Press, Inc. 2002, p. 26-39.

Student Mentoring/Advising (limited to Cornell):

Graduate students—Major advisor/Chair of Special Committee:

- | | |
|--------------|--|
| 2013-present | Sarah Dumas, Ph.D. graduate student in Comparative Biomedical Sciences |
| 2010-present | James Lata, Ph.D. graduate student in Biomedical Engineering |
| | Jennifer Nagashima, Ph.D. graduate student in the Joint Graduate Training Program with the Smithsonian Conservation Biology Institute |
| | Lauren Wu, Masters graduate student in Animal Science (medical leave) |
| 2004-2010 | Danielle Buttke, D.V.M./Ph.D. graduate student (currently One Health Coordinator, National Park Service, Fort Collins, CO, after an Epidemic Intelligence Services fellowship at the Centers for Disease Control and Prevention) |
| 2003-2009 | Yeun-Hee Kim, One year graduate BK21 fellowship from Seoul National University, South Korea; then a graduate student at Cornell (currently a |

post-doctoral associate at Yale University)
2004-2007 Vimal Selvaraj, B.V.Sc., M.S., graduate student in Molecular & Integrative
Physiology (currently an Assistant Professor at Cornell University)

Graduate students—Committee member:

2013-present Mark Richards, Ph.D.
Seoho Lee, Ph.D.
2012-present Lara Mouttham, Ph.D.
2010-2012 Andrew Modzelewski, Ph.D.
2009-2010 Jessye Wojtusik, M.S.
2008-2012 Joyce Stuckey, D.V.M./Ph.D.
2007-2013 Jessica Grodio, D.V.M./Ph.D.
2007-2011 Haixin Chang, Ph.D.
2006-2010 Lindsey Trevino, Ph.D.
2005-2012 Krystal Allen, D.V.M./Ph.D.
2005-2009 Lori Napoleone, Ph.D.
2003-2007 Joseph Folger, Ph.D.

Veterinary and medical students—Summer and independent study research advisor:

2014 Gail Huckins, Cornell University Veterinary Investigator Program
2013 Katherine Backel, Cornell University, Expanding Horizons research experience in
Zambia
Shalette Dingle, Cornell University, Expanding Horizons research experience in
Namibia
2012 Elizabeth McCalley, Texas A&M University, summer Leadership Program
Katherine Schuhmacher, Cornell University, independent research
Kelsey Shaw, Cornell University, independent research
2011-12 Chelsea Anderson, Cornell University, independent research
2011 Erasmus zu Ermgassen, Cambridge University, summer Leadership Program
2010 Abdelaziz Farhrat, Weill-Cornell Medical College in Qatar
Gertje Peterson, Freie Universitat Berlin, summer Leadership Program
Sirima Yaemsiri, North Carolina State, summer Leadership Program
2008-12 Sarah Dumas, Cornell University, multiple Expanding Horizons and opportunity
block research experiences in Zambia
2008 Sophie Kay, Royal Veterinary College, summer Leadership Program
2007 Rosemary Brungs, Sydney University, summer Leadership Program
2006 Catherine Holmes, Emmanuel College, Cambridge University, summer
Leadership Program
2005 Louise LeFlufy, Bristol University of Bristol, School of Clinical
Veterinary Science, summer Leadership Program
2003 Erika Gruber, Cornell University, College of Veterinary Medicine,
summer Leadership Program

Undergraduate students—Research advisor:

2014 Zachary Dvornicky-Raymond undergraduate independent study and summer
work study
2012-2014 Skylar Sylvester undergraduate independent study and summer work study
2012-2013 Kaho Mineta undergraduate independent study
2011 Daniel Bunis undergraduate independent study
2010 Katherine Backel undergraduate independent study
Darwin Chan undergraduate independent study

- 2008 Bassem Ramzy Abdelmalak, summer research student, Weill-Cornell Medical College in Qatar
2007-2008 Jeremy Salerno, undergraduate summer research and independent study
2003 & 2006 Erin McDonald, Henry E. Bartels Undergraduate Action Research Fellowship (2003) and Expanding Horizons Fellowship (2006)
2003 Sarah Lindauer undergraduate independent study

High School Student Mentoring:

- 2012 Joanna Barrett, volunteer semester-research project
2007 Nicole Dean, through the T-S-T New Visions program

Post-doctoral Associate and Research Associate Mentoring/Advising:

- 2011-present Chinatsu Mukai, Ph.D. (returned to my laboratory as a Research Associate)
2010-present Roy Cohen, Ph.D. (promoted to Research Associate in 2011)
2010-2013 Lizeng Gao, Ph.D.
2005-2012 Atsushi Asano, Ph.D. (promoted to Research Associate in 2008; currently a tenure-track Assistant Professor at the University of Tsukuba, Japan)
2007-2008 Vimal Selvaraj, B.V.Sc., M.S., Ph.D. (brief post-doctoral training to finish projects prior to post-doctoral fellowship at UC, Davis, and now an Assistant Professor in the College of Agriculture and Life Sciences at Cornell University)
2005-2008 Chinatsu Mukai, Ph.D. (non-tenure track Assistant Professor at the University of Tokyo)
2005 Fiona Hollinshead, B.V.Sc., Ph.D. (advisor on a short term project)
2005 Jozsef P. Hajos, Ph.D. (short term partial support)

Faculty Mentoring:

- 2012-present Soon Hon Cheong, Department of Clinical Sciences, Theriogenology Section
2011-present Motoko Mukai, Food Sciences, College of Agriculture and Life Sciences

Academic Programs Founded or Organized:

- 2010 Joint Graduate Training Program between the Cornell Biological & Biomedical Sciences Program and the Smithsonian Conservation Biology Institute. In conjunction with Dr. Susan Suarez, Director of Graduate Studies of the Field of Zoology & Wildlife Conservation, and Dr. David Wildt, Head, Center for Species Survival, I played a leading role in conceptualizing and implementing this novel graduate training program that fills a key need for biodiversity conservation. In 2014, the JGTP is being expanded to include graduate fields across campus, and the collaboration is being expanded to include multiple programs including in-country projects in Myanmar and Kenya, and joint veterinary residency training as but a few examples.

Academic and Service Committees:

- 2013-present Faculty Director for the Environment, Atkinson Center for a Sustainable Future (multiple committees and working groups; 25% effort)
2012-2013 Search committee for Baker Institute faculty position
2012-2013 Atkinson Center for a Sustainable Future, Chair, Faculty Advisory Board
2012 Department of Biomedical Sciences, Clinical Professor Reclassification

Committee

2011-present	Executive Committee, Graduate Field of Zoology & Wildlife Conservation
2011-2012	Search committee for Theriogenology faculty position (search was successful, resulting in the hiring of Dr. Soon Hon Cheong)
	Search committee for Baker Institute faculty position (unsuccessful)
	Atkinson Center for a Sustainable Future, Communications Committee
2011	Atkinson Center for a Sustainable Future, Vice-Chair, Faculty Advisory Board
	College of Veterinary Medicine ad hoc committee for tenure review
2010-2013	Atkinson Center for a Sustainable Future, Faculty Advisory Board
2010-2011	University Animal Care and Use Program Advisory Committee
2009-2013	Veterinary Research Training Committee
2009-2010	University Working Group on Research, Scholarship and Creativity (part of University strategic planning process, selected by the Senior Vice Provost for Research)
	Search committee for Cooperative Unit Assistant Leader (USGS, DEC, Dep't. of Natural Resources; search was successful, resulting in hiring of Dr. Angela Fuller)
2008-2009	Graduate Research Assistantship Admissions Committee
2008	Committee to evaluate programs for post-veterinary scientific training
2007	Chair, Search committee for Baker Institute faculty position (search was successful, resulting in the hiring of Dr. Scott Coonrod)
	Search committee for lecturer in Zoo and Wildlife Medicine service (successful re-appointment of Dr. Noha Abou-Madi)
2005-2006	Search committee for Laboratory Animal Medicine residents (successful)
2005-2006	Committee to discuss clinical research studies program
2005	Search committee for technician for core embryo cryopreservation service
2003-2009	D.V.M./Ph.D. Dual Degree Oversight/Admissions Committee representative of the Department of Biomedical Sciences
2003-2004	Biomedical Sciences genomics search committee for 2 faculty members (search was successful, resulting in the hiring of Drs. Paula Cohen and Timothy O'Brien)
2003-2004	Dean's <i>ad hoc</i> committee to write a charter for the Baker Institute, plan the Institute's scientific direction, and review the Directorship

Faculty Advisor for Student Organizations:

2012-present Veterinarians Interested in Developing Areas (VIDA)

Meetings Founded or Organized:

- 2010 Co-organizer and co-host (along with Christopher Barrett) of the international workshop, "Biodiversity Conservation and Poverty Traps," held at the Baker Institute, February 4-5, 2010.
- 2008 Organizer of the symposium, "Wildlife Conservation Research at Cornell: From A to Z (the Arctic to Zambia), held at the College of Veterinary Medicine, October 17, 2008.
- 2004 Founder and organizer of the Northeast Regional Reproductive Biology Meeting, held at the Baker Institute, May 7-8, 2004. Sponsored by Pfizer Animal Health.

Research Interests:

- 1. Male germ cell biology
 - A. compartmentalization of signaling and metabolic pathways in male germ cells

- i. organization, mechanism of segregation, and function of membrane domains in sperm
 - ii. effect of membrane lipids on the behavior of calcium channels and membrane fusion/exocytosis
 - iii. regulation of glucose uptake during spermatogenesis and capacitation
 - B. development of investigative technologies based on spermatogonial stem cells
 - i. testis xenografting and allografting
 - ii. spermatogonial stem cell transplantation
2. Investigations of canine reproduction
 - A. sperm capacitation
 - B. in vitro oocyte maturation and in vitro fertilization
 - C. gamete and embryo cryopreservation
3. Nanobiotechnology; development of biomimetic hybrid organic-inorganic systems for use in:
 - A. micro- and nano-scale energy production
 - B. point-of-care in vitro diagnostic devices
 - C. anti-bacterial applications including biofilm prevention/degradation
4. Investigations of ecosystem-scale, multi-disciplinary efforts to conserve biodiversity by addressing issues of human food security and rural livelihoods
5. Relationship between production and consumption of animal source foods and effects on child health and development

Applied/Clinical Interests:

1. Use of stem cell technologies for wildlife conservation
2. Development of diagnostic technologies to evaluate male fertility
3. Development of technologies of assisted reproduction in the dog
4. Application of nanobiotechnology for the design of diagnostic and therapeutic devices, particularly for stroke and traumatic brain injury
5. Holistic approaches to wildlife conservation

Veterinary Employment History:

- January, 1996-September, 2000: Veterinarian, part-time associate, Animal and Bird Health Care Center and Hospital, Cherry Hill, NJ. Appointments, medical work-ups, and occasional emergency surgeries in a practice treating 50% small animal, and 50% exotic animal patients.
- June, 1995-January, 1996: Veterinarian, part-time associate, Pleasant Valley Animal Hospital, Quakertown, PA. Appointments, medical work-ups, routine and emergency surgeries on both small animal and exotic animal patients.

Memberships in Professional and Scientific Societies:

American Society for Cell Biology
Society for the Study of Reproduction
American Society of Andrology
American Veterinary Medical Association

Seminar Series Organized:

Reproductive Physiology/Endocrinology Seminar Series (Fall semester 2004)

Baker Institute Seminar Series (Fall semester 2005)

Editorial and Grant Reviews:

Editorial activities: co-editor of a Special Feature in Sustainability Science on Biodiversity Conservation and Poverty Traps for the *Proceedings of the National Academy of Sciences* (2011)

Editorial Boards:

Biology of Reproduction (Board of Reviewing Editors, 2009-present)

PLoS ONE (Editorial Board 2011-present)

Molecular Reproduction and Development (Board of Associate Editors, 2014-present)

Ad hoc reviewer for:

Asian Journal of Andrology

Biochemical Journal

Biology of Reproduction

Developmental Biology

Endocrinology

Environment & Development Economics

Human Reproduction

International Journal of Andrology

Journal of Andrology

Journal of Biological Chemistry

Journal of Cellular Physiology

Journal of Fertility and Sterility

Journal of Proteome Research

Molecular Human Reproduction

Molecular Reproduction and Development

Nature Chemical Biology

PLoS ONE

Proceedings of the National Academy of Sciences

Reproduction

Reproduction, Fertility, and Development

Steroids

Theriogenology

Grants:

NIH: Endocrinology, Metabolism, Nutrition, and Reproductive Sciences IRG

Cellular, Molecular and Integrative Reproduction (CMIR) Study Section

February 2008

January 2010

June 2012 (mail reviewer)

Special Emphasis Panel

December 2009

October 2011

Member Conflict Panel, Endocrinology, Reproduction and Pregnancy

January 2013

U01, Male Contraceptive Development, ZHD1 DRG-H (91) B

December 2013

Joint NIH-EMNRG/USDA

Research Using Agriculturally Important Domestic Species Study Section

March 2011

March 2012

March 2013

March 2014

United States Department of Agriculture: 2001

Wellcome Trust: 2009, 2010

Morris Animal Foundation: 2011

Atkinson Center for a Sustainable Future, Academic Venture Fund: 2011, 2013

Abstracts for meetings: Society for the Study of Reproduction

Academic Presentations:

- 2013 Boyce Thompson Institute for Plant Research, Annual Scientific Retreat, “From nanotechnology to global sustainability—making basic science matter,” Ithaca, NY
Cornell Interdisciplinary Climate Change Forum, faculty “pitch,” Ithaca, NY
Cornell University, International Programs, College of Agriculture and Life Sciences 50th Anniversary, “The Feminization of Agriculture: Truths and Consequences” presentation and panel discussion, Ithaca, NY
Cornell University, Reproductive Physiology and Endocrinology seminar series, “From sperm to stroke: Use of biomimetic tethering of enzymes for brain injury diagnostics,” Ithaca, NY
- 2012 Weill Cornell Medical College, Center for Reproductive Medicine, “Lipid regulation of sperm calcium flux and fertilizing ability—from basic science to possible clinical applications,” New York, NY
Cornell University, Division of Nutritional Sciences, “Developing a participatory socio-economic model for improved food security, rural livelihoods, water management, and conservation in sub-Saharan Africa,” Ithaca, NY
Society for Theriogenology Annual Conference, Baltimore, MD.
“Spermatogonial stem cell-based approaches for carnivore reproduction”
“Development of technologies of assisted reproduction in canids”
17th International Congress on Animal Reproduction (ICAR) “What sperm can teach us about energy production: applications for nanotechnology,” Vancouver, Canada
Featured Presenter, 7th International Symposium on Canine and Feline Reproduction (ISCFR), “Development assisted reproduction technologies in the dog: Focus on in vitro fertilization & genetic manipulation of embryos,” Whistler, B.C., Canada
Georgetown University, Department of Biochemistry seminar series, “From sperm to stroke: a tale of compartmentalized pathways in exocytosis and motility leads to unexpected territory,” Washington, D.C.
McGowan Institute for Regenerative Medicine, University of Pittsburgh Medical Center, Annual Scientific Retreat, “Development of Transgenic Canine Models for Preclinical Studies, Farmington, PA
Cornell University, Vertebrate Genomics seminar series, “Lipid regulation of sperm calcium transients and acrosome exocytosis: key roles for G_{M1} and the α_{1E} subunit,” Ithaca, NY
- 2011 University of Calgary, Frontiers in Veterinary Medicine seminar series, “Compartmentalized Pathways in Sperm: From Acrosome Exocytosis to Applications in Nanotechnology,” Calgary, Canada
Gordon Research Conference, Fertilization and Activation of Development “Lipid regulation of sperm calcium transients,” Plymouth, NH
American Society of Andrology, Annual Meeting, “Diverse Roles for Membrane Rafts in Sperm Maturation,” Montreal, Canada.
National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, “Compartmentalized Pathways in Sperm: From Acrosomal Exocytosis to Applications in Nanotechnology,” Bethesda, MD
- 2010 Cornell University, Department of Natural Resources, “Community Markets for Conservation (COMACO): Using markets to link biodiversity conservation outcomes with sustainable improvements in rural livelihoods and food production

- in the Luangwa Valley, Zambia,” Ithaca, NY.
Weill Cornell Medical College, Cell and Developmental Biology seminar series
“Sterol and G_{MI} dynamics regulate sperm fertilizing ability,” New York, NY
Cornell University, International Institute for Food, Agriculture, and Development,
“Wildlife conservation through community food security: A case study from
Zambia,” Ithaca, NY
Keck Biomembrane Retreat, “Mechanisms by which sterol efflux helps initiate sperm
acrosomal exocytosis,” Cornell University, Ithaca, NY.
- 2009 National Institutes of Health, Pioneer Award Interview presentation, “Nanoscale energy
production for implantable medical devices,” Bethesda, MD
Unither, 2nd Annual Nanomedical & Telemedical Technology Conference, “Sequential
metabolic reactions on a chip: A step toward energy production to power
implantable medical nanodevices,” Orford, Quebec, Canada
University of Maryland, Molecular and Cell Biology seminar series “Membrane micro-
domains in sperm—beyond ‘raft’ and ‘non-raft’ in terms of organization and
function,” College Park, MD
United States Agency for International Development, “Developing a participatory socio-
economic model for food security, improved rural livelihoods, watershed
management and biodiversity conservation in Southern Africa,” Washington D.C.
(This presentation was an overview of our work on the SANREM-CRSP project,
and stressed themes, findings, and development impacts.)
United States Agency for International Development, “Developing a participatory socio-
economic model for food security, improved rural livelihoods, watershed
management and biodiversity conservation in Southern Africa,” Vienna, VA
(This presentation was at the scientific session of the annual SANREM-CRSP
meeting, and focused on research questions, methodologies, and results. It was
given “tag-team” with Lydia Gaterre and Sam Bell.)
- 2008 Cornell University, symposium sponsored by the Center for Wildlife Conservation,
“From stem cells to snares: new approaches to wildlife conservation,” Ithaca, NY
Featured Presenter, 6th International Symposium on Canine and Feline
Reproduction (ISCFR), “Development of new stem cell-based technologies for
carnivore reproduction research,” University of Veterinary Sciences, Vienna,
Austria
University of Pennsylvania, Center for Research on Reproduction and Women’s
Health seminar series “Sperm membrane macro-domains and micro-domains: It’s
more complicated than ‘raft’ vs. ‘non-raft’ in terms of organization and function,”
Philadelphia, PA (same seminar also given at New Bolton Center, Kennett
Square, PA)
SANREM-CRSP Annual Meeting, “An agricultural markets model for biodiversity
conservation,” Los Baños, Philippines
SANREM-CRSP Annual Meeting, “Vaccination trials for Newcastle disease virus:
evaluation of impacts on village poultry production and bushmeat consumption,”
Los Baños, Philippines
Laval University, Centre de Recherche en Biologie de la Reproduction seminar series,
“Membrane domains in mammalian sperm: dynamics and functions,” Quebec
City, Canada
Cornell University, Biomedical Sciences seminar series “Membrane domains in
mammalian sperm: dynamics and functions,” Ithaca, NY

- 2007 Cornell University, Pfizer Animal Health Award for Research Excellence seminar, “Membrane sub-domains in mammalian sperm,” Ithaca, NY
SANREM-CRSP Annual Meeting, “Developing a participatory socio-economic model for food security, improved rural livelihoods, watershed management, and biodiversity conservation in southern Africa,” Cochabamba, Bolivia
- 2006 Cornell University, Cornell International Institute for Food, Agriculture, and Development seminar series “Achieving biodiversity conservation through food security and rural livelihoods in Zambia: The COMACO model,” Ithaca, NY
Fred Hutchinson Cancer Research Center, Clinical Research Division, Work in Progress Seminar “Manipulation of germline stem cells and embryos in the dog and cat: Applications for transgenesis and preservation of genetic diversity,” Seattle, WA
SANREM-CRSP Annual Meeting “A multi-disciplinary approach to biodiversity conservation in Zambia: a partnership between the Wildlife Conservation Society and Cornell University,” Virginia Tech University, Blacksburg, VA
Seoul National University, “Current Trends of Conservation Biology” International Education Workshop, lecture: “From spermatogonial stem cells to mature sperm: new thoughts on preserving genetic diversity,” Seoul, South Korea
Seoul National University, “Current Trends of Conservation Biology” International Education Workshop, workshop/wet lab: “How to perform testis xenografting,” Seoul, South Korea
- 2005 Université de Montréal, Guy Bernier Centre de Recherché, Hôpital Maisonneuve-Rosemont, seminar series “Membrane sub-domains in mammalian sperm: sterols, gangliosides, and the lipid raft hypothesis,” Montreal, Canada
Gordon Research Conference, Fertilization and Activation of Development “Lipid rafts in sperm,” Plymouth, NH
University of Pennsylvania, Center for Animal Transgenesis and Germ Cell Research seminar series, “Segregation of lipid sub-domains in live mammalian sperm,” Kennett Square, PA
Cornell University, James A. Baker Institute for Animal Health seminar series, “A multi-disciplinary approach to conservation in Zambia: a partnership between Cornell and the Wildlife Conservation Society,” Ithaca, NY
- 2004 Rockefeller University, Population Council seminar series, “Lipid sub-domains in live mammalian sperm: roles in capacitation and potential clinical applications,” New York, NY
American Society for Cell Biology, 44th Annual Meeting, Mini-Symposium on Establishment and Maintenance of Membrane Sub-domains, “Organization of micron-scale lipid rafts in live murine sperm,” Washington, D.C.
Northeast Regional Reproductive Biology Meeting, “Visualization of lipid raft sub-domains in murine sperm,” Cornell University, Ithaca, NY
Felid Taxon Advisory Group annual meeting, “Progress on stem cell-based reproductive technologies in the cat.” Albuquerque, NM
Cornell University, Department of Clinical Sciences summer seminar series, “From stem cells to sperm: the development of new technologies for wildlife conservation,” Ithaca, NY
Cornell University, Center for Vertebrate Genomics, “Mice, cats, and

- dogs: three different models and three different approaches to preserving genetic diversity and creating tools for genomic research," Ithaca, NY
Cornell University, Department of Biomedical Sciences seminar series,
"Regulation of glucose transport during male germ cell development and sperm capacitation," Ithaca, NY
Cornell University, Laboratory Animal Services seminar series,
"Spermatogonial stem cell transplantation and testis xenografting in the cat: developing tools for the conservation of wildlife," Ithaca, NY
- 2003 Felid Taxon Advisory Group annual meeting, "Preservation of spermatogonial stem cells in the cat," Dallas, TX
Cornell University, Biomedical Sciences Symposium, "Organization and Dynamics of Lipid Rafts During Sperm Capacitation," Ithaca, NY
Cornell University, Reproductive Physiology and Endocrinology seminar series,
"Lipid rafts in murine sperm: sub-types, dynamics and potential functions in capacitation," Ithaca, NY
Cornell University, James A. Baker Institute for Animal Health seminar series
"Lipid rafts in murine sperm: sub-types, dynamics and potential functions in capacitation," Ithaca, NY
- 2002 Felid Taxon Advisory Group annual meeting, "Spermatogonial stem cell xenotransplantation in the cat: Potential benefits for conservation," Portland, OR
Georgetown University Medical Center, Department of Cell Biology seminar series, "Compartmentalized signaling and metabolic pathways in murine sperm," Georgetown, MD
- 2001 Utah State University, Department of Animal, Dairy, and Veterinary Sciences seminar series, "Targeting and function of compartmentalized metabolic and signaling pathways in mammalian spermatozoa," Logan, UT
Gordon Research Conference, Fertilization and Activation of Development
"Organization of membrane rafts and expression and localization of caveolin-1 in mammalian spermatozoa," Plymouth, NH
14th Annual Mid-Atlantic Reproductive Biology Meeting
"Membrane rafts and caveolin-1 in sperm: organization of signaling and metabolic pathways," University of Virginia, Charlottesville, VA
University of Massachusetts, Department of Veterinary and Animal Sciences seminar series, "Compartmentalization of signaling and metabolism in spermatozoa: Roles of protein targeting and membrane rafts," Amherst, MA
University of Pennsylvania, Center for Research on Reproduction and Women's Health seminar series, "Compartmentalization of signaling and metabolism in spermatozoa: Potential roles for membrane rafts and caveolin-1," Philadelphia, PA
- 2000 Society for the Study of Reproduction "Mouse sperm capacitation and fertilization: importance of glucose uptake and metabolism," Madison, WI
13th Annual Mid-Atlantic Reproductive Biology Meeting "Effects of glucose on signaling and metabolism during capacitation and fertilization," Georgetown University, Georgetown, MD

Academic abstract/poster presentations (and oral presentations by Travis lab members):

- 2014 Biological and Biomedical Sciences Graduate Program Recruitment Event, Ithaca, NY
Dumas, S. *et al.*, “Measuring the impact of improved village poultry production on household incomes and diets in the Luangwa Valley, Zambia”
- 2012 Biomedical Engineering Society Annual Meeting, Atlanta, GA
Lata, J. *et al.*, “Engineering a tethered enzyme-based stroke diagnostic platform”
105th Annual Meeting of the Society for Reproduction & Development, Ibaragi, Japan
Asano, A. *et al.*, “Membrane rafts regulate PLB activation in murine sperm”
- 2011 Cornell Center for Materials Research Symposium, Ithaca, NY
Gao, et al., “Sequential reactions of surface-tethered glycolytic enzymes”
44th Annual Meeting of the Society for the Study of Reproduction, Portland, OR
Asano A. and Travis A., “Characterization and function of phospholipase B in murine sperm”
Gordon Research Conference on Calcium Signaling, Colby College, Waterville, ME
Cohen, R., *et al.*, “Evidence for G_{M1} -CaV2.3 interactions in activation of murine sperm calcium influx and exocytosis”
Gordon Research Conference on Fertilization and the Activation of Development, Plymouth, NH
Mukai C., *et al.*, “Biomimicry of sperm glycolytic enzymes for nanoscale energy production”
BioNanotech, TechConnect World Conference and Expo, Boston, MA
Gao, L. *et al.*, “Assembly of sequential glycolytic enzymes on a DNA scaffold”
- 2010 American Society for Cell Biology, 50th Annual Meeting, Philadelphia, PA
Gao, L. *et al.*, “Biomimetic energy production by tethered glycolytic enzymes on a DNA scaffold”
Cohen, R., *et al.*, “Evidence for functional interactions between G_{M1} and CaV2.3 in murine sperm acrosomal exocytosis”
Asano, A. and Travis, A.J. “Sterol efflux regulates phospholipase B activation in murine sperm”
Keck Biomembrane Retreat, Ithaca, NY
Asano, A., *et al.*, “Membrane rafts regulate phospholipase B activation in murine sperm”
Cohen, R., *et al.*, “ G_{M1} and voltage-gated calcium channels in sperm activity”
- 2009 Keystone Symposium, Frontiers in Reproductive Biology and Regulation of Fertility, Santa Fe, NM
Kim, Y., *et al.*, “Production of donor-derived sperm after spermatogonial stem cell transplantation in the dog” (oral presentation)
Society for the Study of Reproduction, Pittsburgh, PA
Asano, A. *et al.*, “Biochemical characterization and shotgun proteomics of membrane raft sub-types in murine sperm”
(chosen for oral platform presentation at the Minisymposium on Fertilization and Contraception)
Selvaraj, V. *et al.*, “Mice lacking FABP9/PERF15 develop sperm head abnormalities but are fertile”
Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH

- Asano, A., *et al.*, “Quantitative and qualitative proteomics of membrane raft subtypes in murine sperm”
Asano, A. and Travis, A., “Roles for membrane rafts in targeted transport in male germ cells”
Keck Biomembrane Retreat, Ithaca, NY
Buttke, D., *et al.*, “The influence of the ganglioside G_{M1} on sperm signaling pathways”
- 2008 Japanese Society of Animal Reproduction, 101st Annual Conference, Fukuoka, Japan
Asano A, *et al.* “Membrane organization via selective G_{M1} and sterol trafficking in germ cells: Identification of three sub-types of membrane rafts in murine sperm”
International Society of Stem Cell Research (ISSCR), Annual Meeting, Philadelphia, PA
Kim, Y., *et al.*, “Production of donor-derived sperm after spermatogonial stem cell transplantation in the dog”
Biological & Biomedical Sciences Research Day, Cornell University, Ithaca, NY
Kim, Y., *et al.*, “Production of donor-derived sperm after spermatogonial stem cell transplantation in the dog”
- 2007 American Society for Cell Biology, 47th Annual Meeting, Washington, D.C.
Asano, A., *et al.*, “Biochemical characterization of membrane sub-domains in murine sperm reveal at least 3 types of membrane raft”
Buttke, D., *et al.*, “The role of G_{M1} in mammalian sperm signaling pathways” (chosen for oral platform presentation at the Minisymposium on the Regulatory Roles of Lipid Microdomains)
Mukai, C., *et al.*, “Coupled metabolic reaction on a chip: A step toward energy production on implantable medical devices” (chosen for a press release by the ASCB)
Travis, A., *et al.*, “Visualizing membrane domains in live cells: micron-scale sterol segregation in live sperm membranes”
Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Asano, A., *et al.*, “Heterogeneous composition of membrane raft sub-domains in murine sperm”
Buttke, D., *et al.*, “The effects of G_{M1} on tyrosine phosphorylation and acrosomal exocytosis in murine sperm”
Selvaraj, V., *et al.*, “Micron-scale membrane lipid segregation in live spermatozoa: membrane dynamics and changes after cell death”
Society for the Study of Reproduction, San Antonio, TX
Selvaraj, V., *et al.*, “G_{M1} dynamics indicate membrane changes associated with capacitation in murine spermatozoa”
Biomedical Sciences Retreat, Clinton, NY
Selvaraj, V., *et al.*, “Micron-scale membrane lipid segregation in live spermatozoa: membrane dynamics and changes after cell death”
Keck Biomembrane Retreat, Ithaca, NY
Asano, A., *et al.*, “Isolation and characterization of membrane rafts in murine sperm”
Selvaraj, V., *et al.*, “Micron-scale segregation of endogenous sterols in the plasma membrane of live murine sperm in the absence of crosslinkers: Evidence suggests an aggregated membrane ‘super-raft’”
Center for Life Science Enterprise and NYSTAR Center for Advanced Technology

- Symposium on Public Engagement and Science Communication, Ithaca, NY
Travis, A., *et al.*, "Scaffolded nanoscale cellular energy production: Can sperm help us build nano-machines and medical devices?"
- Keystone Symposium, Bioactive Lipids in the Lipidomics Era, Taos, NM
Asano, A., *et al.*, "Isolation and characterization of membrane rafts in murine sperm" (winner of National Institute of General Medical Sciences Scholarship)
Selvaraj, V., *et al.*, "Dynamics and potential functions of G_{MI} in murine sperm"
- 2006 Keystone Symposium, Lipid Rafts and Cell Function, Steamboat Springs, CO
Buttke, D., *et al.*, "Visualization of G_{MI} in epididymal versus ejaculated mammalian sperm, and possible roles for GM1 in sperm capacitation"
Selvaraj, V., *et al.*, "Micron-scale membrane sub-domains in live murine sperm"
- 2005 Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Asano, A., *et al.*, "Mechanism of membrane sub-domain segregation in mouse spermatozoa"
Buttke, D.L., *et al.*, "G_{MI} visualization in epididymal versus ejaculated mammalian sperm"
Selvaraj, V., *et al.*, "Organization of lipid rafts in live murine sperm"
- 2004 Society for the Study of Reproduction, Vancouver, BC
Travis, A.J. *et al.*, "Characterization and Dynamics of Lipid Raft Sub-domains in Murine Sperm"
15th International Congress on Animal Reproduction, Porto Seguro, Brazil
Gradil, C.M. and Travis, A.J. "Localization of G_{MI} in non-capacitated and capacitated equine sperm"
- 2003 Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Travis, A.J., *et al.*, "The organization and dynamics of distinct lipid sub-domains in the plasma membrane of spermatozoa during capacitation"
- 2002 Gordon Research Conference, Mammalian Gametogenesis/Embryogenesis, New London, CT
Travis, A.J., *et al.*, "Expression of the glucose transporter, Glut3, in murine male germ cell development and regulation of glucose uptake during sperm capacitation"
- 2001 American Society for Cell Biology Conference, Washington, D.C.
Travis, A.J., *et al.*, "Expression and activity of a 'soluble' adenylyl cyclase, 'sAC,' in male germ cells and mature spermatozoa"
Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Travis, A.J., *et al.*, "Expression and activity of a 'soluble' adenylyl cyclase, 'sAC,' in male germ cells and mature spermatozoa"
Travis, A.J., *et al.*, "Expression and localization of a 'soluble' adenylyl cyclase, 'sAC,' in the epididymis, vas deferens, and oviduct"

- Travis, A.J., *et al.*, "Correlation of expression and localization of a 'soluble' adenylyl cyclase, 'sAC,' with sterol-producing tissues"
- 2000 American Society for Cell Biology Conference, San Francisco, CA
Travis, A.J., *et al.*, "Expression and localization of caveolin-1 in mouse and guinea pig spermatozoa" *Mol. Biol. Cell* 11(S):121a.
- 1999 Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Travis, A.J., *et al.*, "cAMP mediates a capacitation-dependent rise in sperm reducing power, and glucose metabolism is critical for the protein tyrosine phosphorylation events correlated with capacitation" American Society for Cell Biology Conference
Travis, A.J., *et al.*, "A novel, NH₂-terminal, non-hydrophobic motif targets a male germ cell-specific hexokinase to the endoplasmic reticulum and plasma membrane" *Mol. Biol. Cell* 10(S):87a
- 1997 American Society for Cell Biology Conference, Washington, D.C.
Travis, A.J., *et al.*, "Characterization of germ cell-specific type 1 hexokinases in mouse spermatozoa." *Mol. Biol. Cell* 8(S):219a
[posters of this work at earlier stages of development were presented at the Gordon Research Conference, Fertilization and Activation of Development, 1997; and at the University of Pennsylvania Veterinary Faculty Research Retreat, 1997]
- 1995 Gordon Research Conference, Fertilization and Activation of Development, Plymouth, NH
Visconti, P.E., *et al.*, "Properties and localization of a tyrosine-phosphorylated form of hexokinase in mouse sperm"

Educational, Service, Outreach and Development-Related Presentations and Published Interviews:

- 2014 College of Veterinary Medicine Theriogenology Club, "De-Extinction," Cornell University, Ithaca, NY
Cornell University Alumni Club of Boston, "Controversies in Sustainability," Boston, MA
- 2013 Department faculty meeting, "Opportunities for Molecular Biology & Genetics to Engage in Issues of Sustainability" Cornell University, Ithaca, NY
Department faculty meeting, "Opportunities for Biomedical Sciences to Engage in Issues of Sustainability" Cornell University, Ithaca, NY
Department faculty meeting, "Opportunities for the Boyce Thompson Institute for Plant Research to Engage in Issues of Sustainability" Cornell University, Ithaca, NY
Special Species Symposium, "Biodiversity Conservation & Human Poverty and Hunger," Cornell University, Ithaca, NY
Undergraduate Wildlife Society, "Addressing biodiversity conservation by focusing on human poverty and hunger," Cornell University, Cornell University, Ithaca, NY
Instructional lecture to veterinary students for the inaugural Veterinary Student Research Day, "How to make and present a scientific poster," Cornell University, Ithaca, NY

- Department faculty meeting, “Opportunities for Population Medicine & Diagnostic Sciences to Engage in Issues of Sustainability” Cornell University, Ithaca, NY
Cornell University Alumni Club of Los Angeles, “Keeping it Wild: The Future of Wildlife Conservation,” Los Angeles, CA
Cornell University Alumni Club of San Diego, “Keeping it Wild: The Future of Wildlife Conservation,” San Diego, CA
- 2012 Baker Institute Advisory Council Meeting, “Faculty Research Update: Wildlife Conservation” Cornell University, Ithaca, NY
College of Veterinary Medicine admissions “Focus on the Faculty” presentation, Cornell University, Ithaca, NY
CARE, USA—Cornell University Strategic Partnership event, poster “Improving poultry production in the Luangwa Valley, Zambia to combat poverty, poaching, and food insecurity,” Washington, D.C.
Cornell University Alumni Reunions presentation and panel discussion, “A Global Concern: Wildlife Conservation, Economic Sustainability, and Public Health in Africa,” Ithaca, NY
- 2011 *Nature Climate Change*, “Beyond Boundaries: Community Capital” published interview regarding interdisciplinary collaborations, 1(7): 370.
Celebration of the New Joint Graduate Training Program, National Zoological Park, Washington, D.C. (oral presentation and multiple posters given)
Cornell University Board of Trustees Meeting, Next-Gen Leaders in the Life Sciences session, “From sperm to stroke: biomimicry and nanotechnology,” Ithaca, NY
Special Species Symposium, “Roles for Veterinarians in Influencing the Relationship Between Poverty, Food Insecurity, and Biodiversity Conservation,” Cornell University, Ithaca, NY
College of Veterinary Medicine Reunions, “Saving wildlife from Alaska to Zambia: New programs in conservation at the College of Veterinary Medicine,” Cornell University, Ithaca, NY
College of Veterinary Medicine admissions “Focus on the Faculty” presentation, Cornell University, Ithaca, NY.
- 2010 Cornell Trustee-Council Annual Meeting, David R. Atkinson Center for a Sustainable Future poster session, “Using conservation farming, soil carbon, and agricultural markets to save wildlife in Zambia,” Cornell University, Ithaca, NY
College of Veterinary Medicine Reunions, “Wildlife conservation at the CVM: From bats to elephants and everything in between,” Cornell University, Ithaca, NY
Baker Institute Advisory Council Meeting, “Nanoscale energy production for implantable medical devices: NIH Pioneer Award” New York, NY
- 2009 College of Veterinary Medicine Reunions, “Wildlife conservation at the CVM: From bats to elephants and everything in between,” Cornell University, Ithaca, NY
Special Species Symposium, “Use of assisted reproductive technologies in wildlife conservation,” Cornell University, Ithaca, NY
Zweig Equine Research Symposium, “Nanoscale energy production for implantable medical devices: Moving from science fiction to reality,” Cornell University, Ithaca, NY
- 2008 Cornell University, symposium sponsored by the Center for Wildlife Conservation,

- overview of the new Cornell Center for Wildlife Conservation and discussion of emerging opportunities for joint graduate training with the Conservation and Research Center of the Smithsonian's National Zoological Park, Ithaca, NY [similar presentation to the Cornell University undergraduate Wildlife Society]
- Alumni Affairs and Development, "From the bench to the bush: New approaches to wildlife conservation (& a sneak preview of the Cornell Center for Wildlife Conservation)" Cornell University, Ithaca, NY
- 2007 Undergraduate Wildlife Society, "Wildlife conservation at the Veterinary College: A well-kept secret no longer," Cornell University, Ithaca, NY
- Weill-Cornell Medical College/KS&A lay scientific meeting on Klinefelter Syndrome, "Growing sperm in nude mice—from a futuristic dream to a reality," Weill-Cornell Medical College, New York, NY
- Special lay seminar, "From the bench to the bush: New approaches to wildlife conservation," Cornell University, Ithaca, NY
- Baker Institute Advisory Council Meeting, "Reproduction: from single sperm to populations of species," Cornell University, Ithaca, NY
- Rotary Club, "Diverse approaches to wildlife conservation: from animal stem cells to rural business development in Zambia (and how a Rotary Graduate Fellowship changed my life)," Ithaca, NY
- Special Species Symposium, "Use of assisted reproductive technologies in wildlife conservation," Cornell University, Ithaca, NY
- Special Species Symposium, "Achieving biodiversity conservation through food security and rural livelihoods in Zambia: The COMACO model," Cornell University, Ithaca, NY
- College of Veterinary Medicine Reunions, "From the bench to the bush: New approaches to wildlife conservation," Cornell University, Ithaca, NY
- 2006 College of Veterinary Medicine Theriogenology Club, "From spermatogonial stem cells to mature sperm: New technologies for the conservation of male genetic diversity," Cornell University, Ithaca, NY
- Baker Institute Advisory Council Meeting, "Achieving biodiversity conservation through food security and rural livelihoods in Zambia: The COMACO model," Cornell University, Ithaca, NY
- 2005 Pre-Veterinary Club, "D.V.M./Ph.D. Dual Degree Program," Cornell University, Ithaca, NY
- Special Species Symposium, "Assisted reproductive technologies in conservation: The promise and problems of new techniques for the preservation of genetic diversity," Cornell University, Ithaca, NY
- Baker Institute Advisory Council Meeting, "Canine embryonic stem cells and transgenesis," New York, NY
- 2003 Finger Lakes Kennel Club, "New technologies in reproductive biology," Cornell University, Ithaca, NY