Faculty Publications continued from page 4

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Shipka, M.P., J.E. Rowell, and M.C. Sousa. 2007. Steroid hormone secretion during the estrous cycle and pregnancy in farmed Alaskan reindeer. J. Anim. Sci. 85:944-951.

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Center for Reproductive Biology Calendar of Events

4/11/07	"Role of seminal plasma in the mechanism of ovulation induction and fertilizaiton in camelids", Dr. Ahmed Tibary, WSU, CUE 419, 4:10-5:00 pm.
4/25/07	"Epigenetic regulation of genetic integrity", Dr. John McCarrey, University of Texas at San Antonio, San Antonio, Texas, CUE 419, 4:10-5:00 pm.
5/2/07	"Avian Reproduction/Toxicology", Dr. Hubert Schwabl, WSU, CUE 202, 4:10-5:00 pm.
5/24/07	10th Annual Center for Reproductive Biology Retreat, Best Western, Orofino, Idaho
6/20/07	"Fish Reproduction", Dr. B. Dan Rodgers, WSU, CUE 202, 4:10-5:00 pm.
7/11/07	"Fish Reproduction/Toxicology", Dr. James Nagler, WSU, CUE 202, 4:10-5:00 pm.
7/21/07	40th Annual Meeting of the Socity for the Study of Reproduction, San Antonio, Texas
8/8/07	"Reproductive Physiology of Lower Vertebrates", Dr. Rolf Ingermann, WSU, CUE 202, 4:10-5:00 pm.

* The CRB seminar workshop program is designed to host one guest speaker per month. As it happens we have one slot open for a guest speaker on November 8, 2006 that we would like to fill soon. Please send me your recommendations of someone you would like to have present to Center members to crb@wsu.edu.

Individual Faculty Grant and Contract Awards (last 3 months)

John Brown (WSU), Entomology, Potlatch, $18,000
John Browse (WSU), Institute of Biological Chemistry, USDA-CSREES, $396,438
Kenneth Cain (UI), Wildlife Resources, Kootenai Tribe, $126,963
Doug Cole (UI), Microbiology, Molecular Biology & Biochemistry, DHHS-NIH, $269,909
Laura Corley Lavine (WSU), Entomology, NSF, $220,000
Laura Corley Lavine (WSU), Entomology, WA State Tree Fruit Rsch. Com., $80,000
Laura Corley Lavine (WSU), Entomology, WA State Tree Fruit Rsch. Com, $60,000
Rebecca Craft (WSU), Psychology, McManus Charitable Trust, $24,558
Elizabeth Fortunato (UI), Microbiology, Molecular Biology & Biochemistry, DHHS-NIH, $203,014
Michael Griswold (WSU), School of Molecular Biosciences, Univ of WA, $12,844
Ronald Hardy (UI), Aquaculture, University of Alaska, $292,729
Ronald Hardy (UI), Aquaculture, NSF, $76,476
Ronald Hardy (UI), Aquaculture, University of WA, $25,480
Ronald Hardy (UI), Aquaculture, University of WA, $32,000
Ronald Hardy (UI), Aquaculture, Morris Animal Foundation, $8,099
Chengtao Her (WSU), School of Molecular Biosciences, DHHS-NIH, $183,602
Zonglie Hong (UI), Microbiology, Molecular Biology & Biochemistry, NSF, $130,000
Zonglie Hong (UI), Microbiology, Molecular Biology & Biochemistry, NSF, $150,000
Patricia Hunt (WSU), School of Molecular Biosciences, DHHS-NIH, $378,845
Mary Hunzicker-Dunn (WSU), School of Molecular Biosciences, Northwestern Univ., $162,950
Mary Hunzicker-Dunn (WSU), School of Molecular Biosciences, DHHS-NIH, $370,217
Heiko Jansen (WSU), Vet Comparative Anatomy, Pharmacology & Physiology, Univ MI, $68,017
Andrew McCubbin (WSU), School of Biological Sciences, NSF, $5,000
Andrew McCubbin (WSU), School of Biological Sciences, NSF, $130,000
Mark McGuire (UI), Animal & Vet Sciences, USDA-CSREES, $21,250
John McNamara (WSU), Animal Sciences, USDA-CSREES, $201,988
Kathryn E. Meier (WSU), Cancer Prevention Research Center, DHHS-NIH, $185,748
Holly Neibergs (WSU), Animal Sciences, Non Fed Research, $28,000
Ruth Phillips (WSU), WSU Vancouver, USDA, $450,000
Raymond Reeves (WSU), School of Molecular Biosciences, DHHS-NIH, $275,841
Sue Ritter (WSU), Vet Comparative Anatomy, Pharmacology & Physiology, Diabetes Research, $165,000
Hubert Schwabl (WSU), School of Biological Sciences, EPA, $13,896
Lisa Shaffer (WSU), Health Research & Education Ctr, Sacred Heart Medical, $35,211
Milan Shipka (U. of Alaska), Dept. of Plant, Animal & Soil Sciences, USDA $80,235
Michael Skinner (WSU), School of Molecular Biosciences, DHHS-NIH, $225,059
Michael Skinner (WSU), School of Molecular Biosciences, DHHS-NIH, $6,349
Michael Skinner (WSU), School of Molecular Biosciences, DHHS-NIH, $233,847
Mechthild Tegeder (WSU), School of Biological Sciences, NSF, $164,255
Gary Thorgaard (WSU), School of Biological Sciences, Univ. CT, $20,000
Jeffrey Ullman (WSU), Biological Systems Engineering, OGRD WSU, $24,000
Diter von Wettstein (WSU), Crop & Soil Sciences, WTC, $30,718
Beth Vorderstrasse (WSU), Pharmaceutical Sciences, HHS-NIH, $146,800
Michael Webster (WSU) & Hubert Schwabl (WSU), School of Biological Sciences, NSF, $38,634

Center Faculty

Amin Ahmadzadeh, UI
Gustavo Arizabalaga, UI
Laurence Brewer, WSU
John Brown, WSU
John Browse, WSU
Ken Cain, UI
Doug Call, WSU
Allan Caplan, UI
Joe Cloud, UI
Doug Cole, UI
Laura Corley, WSU
Rebecca Craft, WSU
Joe Dalton, UI
Chris Davies, WSU
William C. Davis, WSU
Andy Dittman, NMFS
Victor Eroschenko, UI
Lee Fortunato, UI
Michael Griswold, WSU
Ron Hardy, UI
Terry Hassold, WSU
Chengtao Her, WSU
Donna Holmes, UI
Zonglie Hong, UI
Howard Hosick, WSU
Patricia Hunt, WSU
Mary Hunzicker-Dunn, WSU
Rolf Ingermann, UI
Heiko Jansen, WSU
Zhihua Jiang, WSU
Jill Johnson, UI
Kwan Hee Kim, WSU
Michael Knoblauch, WSU
Suzanne Lindsey, WSU
Jessica Lynch-Alfaro, WSU
Andrew McCubbin, WSU
Mark McGuire, UI
Shelley McGuire, WSU
Derek McLean, WSU
John McNamara, WSU
Rodney Mead, UI
Kathryn Meier, WSU
Mushtaq Memon, WSU
Bruce Miller, UI
James Nagler, UI
Holly Neibergs, WSU
John Nilson, WSU
Brett Parmenter, WSU
Tobin Peever, WSU
Ruth Phillips, WSU-Vancouver
Joe Poovaiah, WSU
Jerry Reeves, WSU
Ray Reeves, WSU
Sandra Ristow, WSU
Sue Ritter, WSU
Andy Roberts, USDA-ARS
Barrie Robison, UI
Dan Rodgers, WSU
R. Garth Sasser, UI
Ed Schmidt, MSU
Chris Scheinder, UI
Paul Schroeder, WSU
Hubert Schwabl, WSU
Philip Senger, WSU
Lisa Shaffer, WSU-Spokane
Eric Shelden, WSU
Steven Sheppard, WSU
Milan Shipka, Univ. Of Alaska
Lisa Shipley, WSU
Michael Skinner, WSU
Kevin, Snekvik, WSU
John Stellflug, USDA
Deborah Stenkamp, UI
Mark Strom, NMFS
Penny Swanson, NMFS
Steven Sylvester, WSU-Vancouver
Loverine Taylor, WSU
Mechthild Tegeder, WSU
Gary Thorgaard, WSU
Ahmed Tibary, WSU
Jeffrey Ullman, WSU
Dirk Vanderwall, UI
Paul Verrell, WSU
Diter von Wettstein, WSU
Beth Vorderstrasse, WSU
Mike Webster, WSU
Gordon Woods, UI
Ray Wright, WSU
John Wyrick, WSU
Bill Young, UI
Graham Young, UW

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CENTER REPORT

Center for Reproductive Biology
WSU & U of I

Faculty, Student, and Staff Newsletter

Washington State University
World Class. Face to Face.

Spring 2007

Director's Message

The "Center Report" is used to inform the University community and interested individuals of the recent activities and accomplishments of the Center for Reproductive Biology. The Center for Reproductive Biology is an organized research unit between Washington State University and the University of Idaho. The Center is internationally recognized as a center of excellence in the area of reproductive biology research. The primary goals of the Center are to foster the highest quality research, promote research collaborations, enhance multi-investigator grants, and enhance the training and education programs in the area of reproductive biology.

The Center now has 87 faculty and over 250 trainees and staff. The Center integrates 7 Colleges and 18 Departments between the two Universities and is one of the largest Centers in the area of reproductive biology in the country. Our bi-weekly Workshop and Seminar program continues to include a wide range of outside speakers involved in reproductive biology. Several of the research programs of the Center are making progress as discussed in the Report. Outlined in this report are some of the accomplishments of the faculty over the past five months. For more information, please visit our web site at http://www.reproduction.wsu.edu.

Michael K. Skinner, Director
Center for Reproductive Biology

University of Idaho

Worthy of Note:

Dr. James Nagler, Biological Sciences (UI), spearheaded a study examining why previous studies has found sex-reversed salmon in the Columbia River in the Hanford Reach, but not in similar environments with similar estrogen-mimicking chemicals. Dr. Nagler's research has concluded that the DNA markers determining sex of the fish previously not definitive genetic markers associated with male salmon rather Dr. Nagler concludes that they are more likely to be randomly moving around in the genome. The complete article regarding Dr. Nagler's research can be found in the April 1, 2007 edition of the Seattle Times. Dr. James Nagler, has also recently coordinated a research project to study the effect of xenoestrogen, 17a-ethynylestradiol, on reproduction in male rainbow trout. This collaboration involves the University of Idaho, Washington State University and Battelle's Pacific Northwest Division Marine Sciences Laboratory. More information on this project can be found in the March/April edition of Fish Farmer.

Two Center for Reproductive Biology faculty have been featured in the Washington State Magazine providing a glimpse into the evolutionary biology research being accomplished at WSU. Dr. Michael Webster, an associate professor in the School of Biological Sciences at WSU shares with the reader his passion for studying the evolutionary path of the red-backed fairy-wren's reproduction and mating practices. According to Michael this work stems from his desire to expand not only our understanding of speciation and evolutionary biology, but also to provide a glimpse into the extraordinary wonder of nature. Dr. Laura Corley Lavine, assistant professor in the Department of Entomology at WSU shares how she developed a desire to understand the role of phenotypic plasticity in evolution and embryology. Dr. Lavine studies phenotypic plasticity using the model of a male dung beetles' horn development to assess how this developmental process is controlled. Her work has help identify the processes of positive, negative and neutral selection in evolution and embryology. Both of these interesting articles can be found in the Spring 2007 edition of the Washington State Magazine.

Dr. John McNamara, Animal Sciences (WSU), and his associate Jennifer Sumner have recently demonstrated how the mineral chromium is capable of altering the expression of genes in the body fat of dairy cattle. In this study they demonstrated that chromium has a significant impact on the metabolism of body fat through its role in stimulating the expression of some genes while simultaneously inhibiting the expression of others. This novel insight into the specific role that chromium plays in both fat metabolism and milk production in dairy cattle provides specific evidence for the role of nutrigenomics in metabolism function.

Dr. Jerry Reeves, Animal Sciences (WSU), recently finished a collaborative effort to produce an anti-LHRH (luteinizing hormone releasing hormone) vaccine. This new and innovative vaccine produces a 95% effective sterilization in bulls. Congratulations Reeves' team on this wonderful discovery!

Dr. Ronald Hardy, Biological Sciences (UI) is helping to lead the way to develop alternative sources for fish meal to provide alternative sources of protein-rich feed for farmed salmon and trout. Fish Farmer Magazine (March/April edition) reported that Idaho has been integral to solving this problem with decades of research showing the proteins derived from grains such as corn, wheat and barley can provide the protein-rich ingredients required for a potentially sustainable fisheries industry.

News

Aquaculture

In September, the University of Idaho welcomed the grand opening of the new $3.2 million biotechnology aquaculture laboratory and office complex at the ARI site in Hagerman, Idaho. The expansion of the Aquaculture Research Institute at the University is only one piece of a larger network of forward-thinking actions taking by the University's administration in continuing its excellence in providing the leading research and expertise in the area of aquaculture studies and industry. These aquaculture laboratories at UI are currently responsible for about 70% of the rainbow trout farmed in the United States and provide a primary source of support for immediate concerns found in the aquaculture industry. Dr. Ronald Hardy, Biological Sciences (UI) is the director of the new facility and believes that this additional facility/resource will allow established collaborations to continue while also providing room for expansion into new areas of scientific discoveries. Congratulations to the University of Idaho!

Salmon Reproduction & Restoration

Five members of the Center for Reproductive Biology are currently working on research projects designed to save the salmon and steelhead populations of the Pacific Northwest. Drs. Gary Thorgaard, Doug Call, B. Dan Rodgers, Kevin Snekvik and Ruth Phillips are collaborating to determine why the fish numbers are dwindling in this area. The Fish Reproduction Program facilitated by the CRB uses an interdisciplinary approach to study the biology of fish reproduction. This program incorporates the work of those listed above in addition to many others from the University of Idaho and National Marine Fisheries Services, NOAA who are hoping to identify the factors that may contribute to the declining survival rate. For more information regarding these projects please visit our web site at www.reproduction.wsu.edu under the program projects section.

10th Annual Center Retreat!

The 10th annual Center for Reproductive Biology Retreat will be held on May 24/25, 2007 at the Best Western, Lodge at Rivers Edge, Orofino, Idaho. We are very excited to have Dr. Mary Ann Handel as our keynote speaker. Dr. Handel is a Senior, Research Scientist at The Jackson Laboratory in Bar Harbor, Maine. Dr. Handel is an expert in the genetic regulation of spermatogenesis and male fertility. We also will highlight a retirement lecture from Dr. Jerry Reeves. The retreat provides Center members and trainees an opportunity to share their research and collaborate on future endeavors. Please mark your calendars and plan on attending the retreat. More information and to register please view the meetings section of the Center's web site at: www.reproduction.wsu.edu.

Faculty Spotlight:

Dr. Jerry J. Reeves

Dr. Jerry Reeves received his Ph.D. from the University of Nebraska in 1969 and went on to hold an NIH Postdoctoral Fellow position at Tulane Medical School in New Orleans where he worked with Dr. A.V. Schally, Nobel Laureate. In 1970 Jerry became an Assistant Professor at Washington State University and remains at the institution today. Thirty years later Dr. Reeves holds a Professor and Baxter Endowed Chair position in the Department of Animal Science, is a member of the Center for Reproductive Biology and has excelled in his teaching and research. He will retire this year and leave behind him a legacy of excellence and mentorship to be rivaled.

Jerry has had a strong research record and has contributed significant insight into the reproductive endocrinology of cattle and our basic understanding of the endocrine system. He is truly a collaborator in that he has enhanced the research efforts of a large number of investigators, including the Noble Laureate Dr. Andrew Schally. Throughout his career he has continued to be productive and apply state of the art advances to his research. An example of which is his recent project to perform spermatogonial transplantation in cattle. Jerry's research on a cattle sterilization vaccine has led him to work with cattle ranchers in the amazon and has allowed him face to face interactions with not only cattle, but snakes and piranha as well.

Jerry is also an extremely accomplished teacher as shown by his numerous awards, the Distinguished Faculty Address in 2000. Jerry is truly a "mentor," he has trained more than 50 graduate students and numerous undergraduate students, many whom have gone on in science and hold prominent positions today. In public service, Jerry Reeves is one of the most well-known cattle reproductive biologists in the Northwest and nationally. This is due in large part to his extensive service and assistance to the cattle and dairy industries in the State. Let's commend Jerry for his many accomplishments.

Congratulations Dr. Reeves on your accomplishments and participation, the Center is better for having had your membership and we look forward to watching as you enter this next phase of your life. Cheers!

Items of Interest

New Center Faculty

Please welcome new faculty members Dr. Jeffrey Ullman and Dr. Laurence Brewer.

Dr. Jeffrey Ullman is an Assistant Professor in the Biological Systems Engineering at Washington State University. Dr. Ullman comes to WSU from Texas A&M University where he received his PhD in Biological and Agricultural Engineering in 2006. His research interest focuses on the examination of toxicological effects on aquatic organisms.

Dr. Laurence Brewer is an Assistant Professor in the School of Chemical Engineering and Bioengineering at WSU. Dr. Brewer's main area of interest is chromatin remodeling during spermiogenesis, which he studies in the Syrian hamster, bull, and salmon. He is specifically interested in how the genome is compacted, how histones are displaced, and the function that each of the sperm nuclear proteins serves to accomplish these tasks.

Welcome to the Center for Reproductive Biology Drs. Ullman and Brewer, we are excited to have you join us and look forward to collaborative efforts with you!

Proteomics Core Lab Updated

The Proteomics Core Laboratory has recently undergone several changes with the addition of new personnel, new equipment and advances in technologies. Proteomics Core personnel include, Director James Bruce, Co-Associate Director William Siems, Co-Associate Director Xiaoling Tang, Project Associate Chongjie "Jackie" Zhu, Project Associate Gerhard Munske and Manager Lisa Washburn. The addition of Drs. Tang and Munske, and Jackie Zhu in concert with the new instrumentation has aided in the ability of the core to provide higher efficiency services to core lab users. The new capability of the core adds to its previous routine protein identification process allowing the identification of the majority of proteins in a complex mixtures without using preliminary electrophoretic separations. Quantitative techniques are also now available for complex protein mixtures to assess changes in protein levels. The new procedures provide a significant advance upon the traditional protein biochemical techniques and original proteomics procedures. To get more information regarding services you can access the Proteomics Core Laboratory information at www.reproduction.wsu.edu under the Core Laboratory section, or by contacting Dr. Tang at 509-335-7134. These new advances in the Proteomics Core services are impressive and will enhance future research in protein identifications.

CRB Members Sponsor Research Collaboration Conference

Drs. Patricia Hunt and Terry Hassold are sponsoring a research conference focusing on the etiology of human aneuploidy. Their invited guests will each give brief research presentations, but the primary emphasis will be on discussion of the research projects themselves. The meeting was developed as part of grant funding provided to the PI's, which mandates that the conference focus on the development of proposals for extramural funding applications. Therefore, Hunt and Hassold facilitated and sponsored this conference to provide an opportunity to bring researchers together to outline potential projects and – most importantly – to develop collaborative research efforts among the participants that ultimately provide new approaches to the study of aneuploidy. Congratulations Drs. Hunt and Hassold on creating this opportunity and we hope research collaborations are developed!

Faculty Publications (last 5 months)

Xin Z, Mandaokar A, Chen J, Last RL, Browse J 2007 Arabidopsis ESK1 encodes a novel regulator of freezing tolerance. Plant J. 49(5):786-99.

Kumar R, Wallis JG, Skindmore C, Browse J 2006 A mutation in Arabidopsis cytochrome b5 reductase identified by high-throughput screening differentially affects hydroxylation and desaturation. Plant J. 49(6):923-32.

Ramsrud AL, Lafrentz SA, Lafrentz BR, Cain KD, Call DR 2007 Differentiating 16S rRNA alleles of Flavobacterium psychrophilum using a simple PCR assay. J Fish Dis. 30(3):175-80.

Zhou X, Elmose J, Call DR 2007 Interactions between the environmental pathogen Listeria monocytogenes and a free-living protozoan (Acanthamoeba castellanii). Environ Microbiol. 9(4):913-22.

Wan Y, Boschat SL, Call DR 2007 Validation of mixed-genome microarrays as a method for genetic discrimination. Appl Environ Microbiol. 73(5):1425-32.

Davis MA, Hancock DD, Besser TE Daniels JB, Baker KN, Call DR 2007 Antimicrobial resistance in Salmonella enterica serovar Dublin isolates from beef and dairy sources. Vet Microbiol. 119(2-4):221-30.

Yamamoto D, Henderson R, Corley LH, Iwabuchi K 2007 Intrinsic competition between egg, egg-larval, and larval parasitoids of plusiine loopers. Ecological Entomology. 32:221-8.

Craft RM, Clark JL, Hart SP, Pindkney MK 2006 Sex differences in locomotor effects of morphine in the rat. Pharmacol Biochem Behav. 85(4):850-8.

Bernal SA, Morgan MM, Craft RM 2007 PAG mu opioid receptor activation underlies sex differences in morphine antinociception. Behav Brain Res. 177(1):126-33.

Mwangi W, Brown WC, Splitter GA, Davies CJ, Howard CJ, Hope JC, Alda Y, Zhuang Y, Hunter EJ, Palmer GH 2007 DNA vaccine construct incorporating intercellular trafficking and intracellular targeting motifs effectively primes and induces memory B- and T-cell responses in outbred animals. Clin Vaccine Immunol. 14(3):304-11.

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Davies CJ 2007 Why is the fetal allograft not rejected? J Anim Sci. 85(13 Suppl):E32-5.

Traul DL, Li H, Dasgupta N, O'Toole D, Eldridge JA, Besser TE, Davies CJ 2007 Resistance to malignant catarrhal fever in American bison (Bison bison) is associated with MHC class IIa polymorphisms. Animal Genetics. 38:141-46.

Liu W, Brayton KA, Davis WC, Mansfield K, Lagerquist J, Foreyt W, Sirikumara S 2007 Mannheimia (pasteurella) haemolytica leukotoxin utilizes cd18 as its receptor on bighorn sheep leukocytes. J Wildl Dis. 43(1):75-81.

Park KT, Ahn J, Davis WC, Koo HC, Kwon NH, Jung WK, Kim JM, Hong SK, Park YH 2006 Analysis of the seroprevalence of bovine paratuberculosis and the application of modified absorbed ELISA to field sample testing in Korea. J Vet Sci. 7(4):349-54.

Seo KS, Lee SU, Park YH, Davis WC, Fox LK, Bohach GA 2007 Long-term staphylococcal enterotoxin C1 exposure induces soluble factor-mediated immunosuppression by bovine CD4+ and CD8+ T cells. Infect Immun. 75(1):263-9.

Luo MH, Rosenke K, Czornak K, Fortunato EA 2007 Human cytomegalovirus disrupts both ataxia telangiectasia mutated protein (ATM)- and ATM-Rad3-related kinase-mediated DNA damage responses during lytic infection. J Virol. 81(4):1934-50.

Ecker SM, Shima JE, Connolly CM, Sharma M, Holdcraft RW, Griswold MD, Braun RE 2007 Transcriptional Profiling of Androgen Receptor (AR) Mutants Suggests Instructive and Permissive Roles of AR Signaling in Germ Cell Development. Mol Endocrinol. 21(4):895-907.

Fox MS, Clark AT, El Majdoubi M, Vigne JL, Urano J, Hostetler CE, Griswold MD, Weiner RI, Reijo Pera RA 2007 Intermolecular interactions of homologs of germ plasm components in mammalian germ cells. Dev Biol. 301(2):417-31.

Cherry SM, Adelman CA, Theunissen JW, Hassold TJ, Hunt PA, Petrini JH 2007 The Mre11 complex influences DNA repair, synapsis, and crossing over in murine meiosis. Curr Biol. 17(4):373-8.

Susiarjo M, Hassold TJ, Freeman E, Hunt PA 2007 Bisphenol A Exposure in Utero Disrupts Early Oogenesis in the Mouse. PLoS Genet. 3(1):e5.

Her C, Zhao N, Wu X, Tompkins JD 2007 MutS homologues in hMSH4 and hMSH5: diverse functional implications in humans. Front Biosci. 12:905-11.

Zuccarelli MD, Jensen N, Ingermann RL 2007 Inhibitory effect of osmotic concentration, potassium and pH on motility of the sperm of the North American burbot Lota lota maculosa. Journal of Fish Biology. 70:178-89.

Zuccarelli MD, Ingermann RL 2007 Exhaustive exercise, animal stress, and environmental hypercapnia on motility of sperm of steelhead trout (Oncorhynchus mykiss). Comp Biochem Physiol A Mol Integr Physiol. 147(1):247-53.

Wilson-Leedy JG, Ingermann RL 2007 Development of a novel CASA system based on open source software for characterization of zebrafish sperm motility parameters. Theriogenology. 67(3):661-72.

Steinpress EP, Sory BA, Jansen HT 2007 Diurnal differences in dopamine transporter and tyrosine hydroxylase levels in rat brain: dependence on the suprachiasmatic nucleus. Brain Res. 1129(1):34-42.

Rothschild MF, Hu ZL, Jiang Z 2007 Advances in QTL mapping in pigs. Int J Biol Sci. 3(3):192-7.

Jiang Z, Rothschild MF 2007 Swing genome science comes of age. Int J Biol Sci. 3(3):129-31.

Jiang Z, Michal JJ, Williams GA, Daniels TF, Kuneš T 2006 Cross Species Association Examination of UCN3 and CRHR2 as Potential Pharmacological Targets for Antiobesity Drugs. PLoS ONE. 1:e80.

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