

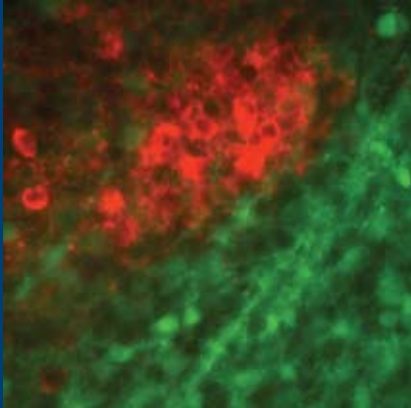
Biomedical Sciences Update

College of Veterinary Medicine and Biomedical Sciences

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Neighboring cell groups defined by their gene expression. Image from laboratory of Dr. Stuart Tobet.

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Department Has Early Roots in Veterinary Teaching Program

The history of the Department of Biomedical Sciences can be traced back to the earliest days of the College, starting in 1934 with the creation of the Department of Veterinary Physiology; the research work of Dr. Frank Gassner in the early 1940s; and the creation of the Department of Veterinary Anatomy in 1945.

The Department of Veterinary Anatomy and the Department of Veterinary Physiology were the early predecessors to the Department of Anatomy and Neurobiology, and the Department of Physiology, respectively. These early departments were focused primarily on education in their initial years, with research getting a slow start. Dr. Gassner, a Professor in the Division of Veterinary Medicine, was a rebel who accorded research the highest priority at a time when institutional teaching and service received the major emphasis. His skill in obtaining grants and his struggle to convince his colleagues of the value of research eventually led to the establishment of the animal reproduction Bull Farm in 1948.

In the late 1950s, College of Veterinary Medicine Dean Rue Jensen could see that research-related opportunities were about to explode, and positioned the College to take advantage of global and national priorities. Departments that had mainly supported the veterinary program with educational expertise embarked more fully on research paths and began to integrate new undergraduate and graduate programs outside of veterinary medicine into their mission. The Department of Physiology took on studies in endocrinology and involved itself more directly with the physical sciences, becoming the Department of Physiology and Biophysics in 1966.

Reflecting a broader research emphasis, the College became the College of Veterinary Medicine and Biomedical Sciences in 1967. Dr. Robert Phemister, Dean of the College from 1977-1982, noted that "the biomedical-veterinary medicine combination is virtually unique among veterinary schools." During the

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Departmental faculty and staff are located in five facilities (clockwise from upper left): Animal Reproduction and Biotechnology Laboratory, Equine Reproduction Laboratory, Anatomy/Zoology, Physiology, and the B.W. Pickett Equine Center.

Welcome to the *Biomedical Sciences Update*

Dear Friends,
In 2002, the Department of Biomedical Sciences was formed when the College of Veterinary Medicine and Biomedical Sciences consolidated its seven departments into four departments. At that time, the Department of Physiology and the Department of Anatomy and Neurobiology merged to form the Department of Biomedical Sciences. In the ensuing years, the Department has retained many of the strengths of the parent departments but also has evolved in new directions and adopted a new identity. Part of that evolution includes the creation of the

Biomedical Sciences Update, a newsletter designed to inform our alumni, friends, colleagues, faculty, students and staff of the endeavors, initiatives and activities that define the current Department of Biomedical Sciences.

The Department of Biomedical Sciences is building on its past and moving on many fronts into new directions that will help define our future. Our research programs in neuroscience and reproductive biology continue to attract national and international recognition, and we are developing a focus in cardiovascular research. We brought in more than \$9.3 million total research dollars in

2005/2006, largely obtained from extramural grant agencies, foundations and private donors.

With the addition of an undergraduate degree in biomedical sciences, our academic programs now provide excellent opportunities at the undergraduate, graduate, professional veterinary and postgraduate levels. Our new undergraduate students already are bringing enthusiasm and new ideas, and are establishing a student organization to better define and meet their needs. Our undergraduate and graduate programs are coordinated and supported by two administrative professionals, Kelly Swetich and Alice Alexander, respectively.

Of course, our faculty members are the heart of our Department and we aim to feature them in this and subsequent issues. In this edition of the *Biomedical Sciences Update*, you'll meet Dr. Robert Handa, a senior faculty member who has been at Colorado State University for eight years. You'll also meet Dr. Scott Earley, one of our recent faculty hires. These two individuals are a part of a very productive faculty team that is regularly recognized for teaching and research excellence, at the College and University level and beyond. I count myself fortunate to have such a talented and dedicated faculty with which to work.

I hope you enjoy this edition of the *Biomedical Sciences Update* and find that it helps you to get a sense of the excitement associated with our developing endeavors. I look forward to seeing you soon at some of our activities.

Best regards,



Barbara M. Sanborn, PhD
Professor and Head, Department of
Biomedical Sciences



Dr. Barbara Sanborn

Department Roots *continued from Page 1*

late 1960s and into the 1970s, under the leadership of Dr. Lloyd Faulkner, there were several targeted hires aimed at expanding and strengthening what was destined to become the Animal Reproduction and Biotechnology Laboratory (ARBL) and the Department of Physiology and Biophysics. Efforts in equine reproduction in ARBL expanded and evolved into the Equine Reproduction Laboratory and the Equine Sciences Program in cooperation with the departments of Clinical Sciences and Animal Sciences.

Dr. James Voss, Dean of the College from 1986-2001, and the College's Executive Council decided to enhance the College's programs even more in 1986 with the creation of the Program in Neuronal Growth and Development, renamed the Program in Molecular, Cellular and Integrative Neurosciences (MCIN) in 1994. The Department of Anatomy reflected this emphasis when it was renamed the Department of Anatomy and Neurobiology in 1988. Focused hiring brought in faculty members whose research in neurosciences positioned the Department to be highly competitive in the federally proclaimed "Decade of the Brain" (1990-1999).

Through the years, College research programs exploded, graduate programs were introduced, and departments were expanded, consolidated and conjoined to

meet changing scientific and academic demands. Along the way, both ARBL and MCIN were designated as University Programs of Research and Scholarly Excellence.

In 2002, the Department of Anatomy and Neurobiology and the Department of Physiology were merged to create the Department of Biomedical Sciences. This change was part of a College-wide re-organizational plan that consolidated seven departments into four. The Department of Biomedical Sciences is home to innovative teaching programs; broad instructional efforts spanning anatomy, pharmacology, physiology and neuroscience; strong research programs in neuroscience and reproductive biology and an expanding program in cardiovascular research; comprehensive graduate programs and a new undergraduate degree in biomedical sciences; and a clinical program in assisted animal reproduction.

"If there is one thing that has defined our Department, it is our ability to adapt to change and take advantage of new opportunities," said Dr. Barbara Sanborn, who assumed leadership of the Department in 2003. "We have a rich and proud history at Colorado State University. When we look to the future and the opportunities available to us because of advances in scientific technology and an increased knowledge base, we are excited by the possibilities."

\$1 Million Gift Benefits CVMBS Equine Research Programs

A \$1 million gift to the College of Veterinary Medicine and Biomedical Sciences at Colorado State University will support internationally known equine reproduction and orthopedics research programs. The gift was given by Jon and Abby Winkelried of the Marvine Ranch near Meeker. Jon Winkelried is a president and co-chief operating officer of Goldman Sachs.

The gift will be evenly split between the Equine Reproduction Laboratory in the Department of Biomedical



Students Casey Gruber and Joy Altermatt work with a mare in the Oocyte Transfer Lab.

Sciences and the Orthopaedic Research Center. New facilities will be constructed on the Foothills Research Campus with the \$500,000 dedicated to equine reproduction. The gift also will support research for the continued development of reproduction techniques. The Equine Reproduction Laboratory conducts internationally recognized reproduction research with scientific breakthroughs that benefit both humans and horses, and also provides equine artificial reproduction services to its clients.

“Jon and Abby are great horse enthusiasts and have a sincere interest in the research at Colorado State. This gift allows us to greatly enhance our current facilities,” said Dr. Ed Squires, a Professor in the Department of Biomedical Sciences and researcher in the Equine Reproduction Laboratory. “We currently house between 100-120 client horses during our busy months, which means our barns are entirely full and we occasionally don’t have room for all of the horses we service. In addition, some of these facilities are more than 30 years old, and this gift allows us to replace them with modern, state-of-the-art barns.”

Since its start in 1967, the Equine Reproduction Laboratory has obtained international recognition. The laboratory’s research breakthroughs include semen freezing, embryo transfer, egg transfer and frozen embryos that currently are used in the equine industry. The lab also offers a full range of commercial mare breeding services, continuing education courses for breeders and veterinarians, and provides horse owners with the most current technology available for reproductive management.

Endowed Scholarship Honors Legacy of Dr. Alan Tucker

A great friend, a gifted scientist, a talented teacher, a dedicated mentor, a devoted husband and father – these are just some of the words used to describe Dr. Alan Tucker, a man who played a vital role in the College of Veterinary Medicine and Biomedical Sciences and Colorado State University for nearly 25 years. After his untimely death in 2004, family and friends of Dr. Tucker created the Alan Tucker Memorial Scholarship to honor his life and legacy. The scholarship is now fully endowed and will be used to create educational opportunities for disadvantaged students.

Recipients must have financial need and be in good academic standing. Primary consideration is given to students who can contribute to the diversity of the College and/or have first-generation status. The recipient is selected by the College Awards Committee.

Born in England, Dr. Tucker immigrated with his parents to the United States at the age of 12. He was the first in his family to graduate from high

school and received undergraduate and doctoral degrees from the University of California at Santa Barbara. Dr. Tucker came to Colorado in the mid-1970s for a postdoctoral fellowship at the University of Colorado Health Sciences Center in Denver. In 1979 he became an Associate Professor of Physiology at Colorado State.

Dr. Tucker’s teaching and research focused on cardiopulmonary physiology and high-altitude medicine. During his tenure Dr. Tucker served as Assistant Dean of the College of Veterinary Medicine and Biomedical Sciences (1989-2000), as head of the Department of Physiology from 1995-2001, and as interim and then appointed Vice Provost for Faculty Affairs from July 2002 until his death in January 2004. He was very active in the Fort Collins community and was involved with various community service organizations.

This scholarship was established by the College through memorial gifts from faculty and friends to honor the memory of Dr. Tucker and pay tribute



Dr. Alan Tucker

to the life and work of this very special educator. His wife, Melissa, is particularly pleased that this scholarship will support a student in Biomedical Sciences, a major which Dr. Tucker actively supported and a discipline to which he was dedicated.

Gender Differences in Depression May Help Lead to Development of New Drugs

Depression is a disease about which much is unknown, but researchers do know that women are much more susceptible to depression than men. The question is why? Why is depression two to two-and one-half times more prevalent in women than in men, and why are anxiety disorders, which can afflict patients by itself or with other diseases, 10 times more prevalent in women than in men?

“One of the biggest projects in our laboratory is looking at what underlies the sex difference in depression,” said Dr. Robert Handa, Professor in the

Department of Biomedical Sciences. “There are two ways we are looking at this. First is the prevalence as it relates to adult women and as it relates to levels of the hormone estrogen. Secondly, we are looking at the development of the brain and how fetal insults can impact its development. The female brain may be more susceptible to developmental insults that can cause the onset of depression in adulthood. We know that, in adulthood, males and females use different strategies to handle stress, and stress affects brain function.”

Dr. Handa said his laboratory is interested in what estrogen does in terms of changing gene expression in neurons and how these changes may contribute to changes in behavior. They also are interested in the developmental consequences of fetal insults and how those may cause an increase in the risk of developing depression later in life.

The beta form of estrogen receptor is of particular interest to researchers in the Handa laboratory, who have found that binding the estrogen receptor beta resulted in reduced anxiety but without the reproductive side effects of drugs that bind to the estrogen receptor alpha. Using rat models, researchers are trying to understand the role that estrogen receptor beta plays in the brain of women and men (testosterone can be converted to estrogen and other metabolites that subsequently bind with estrogen receptors).

“An important part of our work is to correlate our findings with behavioral studies in rats,” said Dr. Handa. “Under the right conditions, rats and mice demonstrate the same depressive/anxiety-like behavior we see in humans, though in rodents it is often referred to as learned helplessness. When stress levels are too high for too long, animals simply disconnect from life, activity levels decrease, sleep patterns are disturbed, and they lose the will to explore. Using a rat model, we can further understand the impact of estrogen receptor beta and how it has potential as a pharmaceutical target, particularly because it is a receptor controlling few reproductive functions, so one wouldn’t expect that drugs targeting estrogen receptor beta will have the reproductive side effects common in other drugs that bind estrogen receptor alpha.”

Many patients with depression suffer for years before finding the right treatment, and some are still waiting. Medications for depression and anxiety can have undesirable side effects or may not be effective at all in certain cases. If researchers are better able to understand the role of estrogen receptors and perhaps selectively target it with drugs, physicians may have one more tool in their arsenal to help treat patients who suffer the often debilitating effects of depression.

Scientific Career Takes Interesting Twists

Growing up in southern California, Dr. Robert Handa thought that a career in marine biology was a natural fit and he entered California State University at Long Beach with every intention of becoming a marine biologist. But life has a funny way of taking you down different paths.

After receiving a bachelor’s degree in zoology, Dr. Handa attended the University of Arizona in Tucson, where he received his master’s degree in physiology and then attended the University of California, Los Angeles, where he completed his PhD in anatomy. Along the way, he also attended the University of Idaho, where he spent a year in the veterinary sciences program and where his initial interest in hormones was generated.

“Hormones struck my fancy at the time. I found it interesting and decided that I wanted to do research in this area,” said Dr. Handa. “After receiving my PhD, I moved to the Oregon Health and Science University in Portland where I took a more biochemical view of hormones and spent several years there with Dr. John Resko, who was a steroid biochemist. He greatly influenced the direction my research career would take.”

Dr. Handa’s first faculty position was at the Loyola University, Chicago, Stritch School of Medicine, where he spent 12 years. At Loyola, his research focused on the sex differences in the incidence of depression and the hormonal events that underlie those differences. After 12 years at Loyola, Dr. Handa decided to join the faculty in the Department of Anatomy and Neurobiology (later to become the Department of Biomedical Sciences) at Colorado State University.

Today, Dr. Handa’s research interests include continuing work into the sex differences in depression and anxiety: the neurological consequences of insults (for example, prenatal stress, drug and alcohol abuse, or hypoxia) that occur during development and the comparative susceptibility of females as compared to males; estrogen receptor beta as a potential drug target for the treatment of depression; and fetal alcohol spectrum disorders affect. In an unrelated series of studies, Dr. Handa’s research team is examining the use of Equol (a compound that is a metabolite of a phytoestrogen) as a nutraceutical supplement to inhibit the pathological growth of the prostate gland.



Dr. Robert Handa

Researchers Tackle Cardiovascular Problems as Heart Disease Toll Mounts

The statistics tell a grim story. In the United States, 38 percent of the adult population has some form of cardiovascular disease. This year, 1.2 million Americans will have their first or recurrent coronary attack and 479,000 of them will die. High blood pressure affects 65 million Americans. Each year, approximately 700,000 Americans suffer from their first or a recurrent stroke and, of those, about 160,000 will die. Almost 35 million Americans have high cholesterol levels, a major risk factor for coronary heart disease and stroke.

It's no secret that cardiovascular disease is the single leading cause of death in the United States, but Dr. Scott Earley and other cardiovascular researchers would like to reverse that trend by developing a greater understanding of cardiovascular physiology as well as finding potential new targets for pharmaceutical intervention.

"In our laboratory, we are interested in transient receptor potential channels (TRP) that are found in all cells, but we are trying to elucidate their functional significance in the vascular cells," said Dr. Earley, an Assistant Professor in the Department of Biomedical Sciences. "TRP channels are the last family of ion channels to be described, so we are just beginning to understand their function and significance."

Ion channels are pore-forming proteins that exist in all living cells and play a large role in many biological functions that involve rapid changes in cells, such as cardiac contraction. Dr. Earley notes that every function of the cell is mediated through ion channels and understanding how ion channels work will help biomedical research move forward. In the search for new drugs, ion channels are a favorite target, including calcium channel blockers to control high blood pressure. TRP channels offer a potential new avenue for intervention into cardiovascular disease. Dr. Earley is studying TRP channels in three cell types involved in vascular function: smooth muscle cells, endothelial cells and astrocytes, glial cells that support the neuronal network. His research work is funded by the American Heart Association.

"The initial characterization of TRP channels has been done; what we are trying to fill out are the signaling pathways," said Dr. Earley. "We want to understand how these channels are activated, or gated, maybe through trafficking or some other mechanism. We do know that, unlike other ion channels, some TRP channels exist in subsurface pools and then can move up to the plasma membrane to conduct current, but we still don't fully understand the mechanism."

Gaps in treatment for cardiovascular disease are creating demand for new

pharmaceuticals that can target novel intercepts in the cell, so while researchers work to understand the basic biology of TRP channels, there also is the realization that their findings have a greater purpose – to perhaps one day help save lives.

"We hope that our basic research will help improve the treatment of cardiovascular disease through a greater understanding of ion channels and how they influence vascular function," said Dr. Earley. "Seventy-one million Americans are affected by some form of cardiovascular disease, so the stakes are high."

Researcher Is Building Lab of His Vision

When Dr. Scott Earley came to Colorado State University in March 2006, he saw a unique opportunity to join a department that already had world-renowned research laboratories but also was looking to invest in more entrepreneurial ventures. A previous entrepreneur himself, Dr. Earley decided to bring his "start-up" to the Department of Biomedical Sciences and set about creating a new laboratory from the ground up.

"The department had not had a start-up lab for a number of years, so everything from getting basic cleaning supplies to ordering and installing equipment was a learning process for everyone," said Dr. Earley, an Assistant Professor whose research focuses on cardiovascular physiology. "But it's pretty exciting when you are able to come into an organization and build your vision."

Dr. Earley grew up in Maine and attended the University of Maine, where he received his bachelor's degree in electrical engineering. While in school, he worked in a laboratory where he developed an interest in the biological sciences and went on to receive his master's degree in microbiology. He worked in prion-related diseases at the McLaughlin Research Institute in Great Falls, Montana, before starting a small biotechnology company in Bozeman, Montana, that was interested in developing transgenic animals that would express genes for the production of pharmaceuticals. After selling his share of the company, Dr. Earley moved to Albuquerque, New Mexico, where he received his PhD in biomedical sciences from the University of New Mexico's Health Sciences Center in 2002.

Following his graduation, Dr. Earley was a Postdoctoral Fellow at the University of Vermont in Burlington, in the laboratories of Drs. Joe Brayden and Mark Nelson, Professor and Chair of the Department of Pharmacology and a world-renowned researcher in smooth muscle vascular physiology.

"The area we are focusing on in our laboratory is transient receptor potential (TRP) channels that are expressed by the cerebral artery smooth muscle," said Dr. Earley. "It's an exciting area and a relatively new one in cardiovascular research, so the opportunities are great. I'm still getting equipment, animal protocol approvals, and purchasing pharmaceuticals, and I'm also trying to hire graduate students and postdocs, so we have a little ways to go before we are fully up and running."



Dr. Scott Earley

Three Tailored-to-Fit Graduate Programs Meet Student Needs

For students interested in careers in the biomedical sciences, or in pursuing degree programs in veterinary or medical schools, the graduate program at the Department of Biomedical Sciences (BMS) offers comprehensive PhD training, as well as something a little unique at the master's level.

Graduate education in the Department has multiple levels: PhD and Masters-A programs are traditional graduate programs that focus on research and coursework, culminating in a written thesis and oral defense. The Masters-B option, however, is a one-year, coursework-only degree that is somewhat unique in that it provides students with a degree opportunity bridging between undergraduate education and professional school and career placement.

"We really encourage our graduate students to take the lead in working with their advisor to create a coursework and research plan that not only meets academic standards but also helps them advance in their areas of interest," said Dr. Stuart Tobet, a Professor in the Department of Biomedical Sciences and Graduate Education Committee member. "Our students also are leaders in the Department, taking responsibility for research retreats, organizing seminars and lecture series, and setting the tone for graduate education."

Alice Alexander works with students as the Graduate Student Professional Coordinator, advising and assisting them with the details of their graduate program as well as troubleshooting for students to create a positive experience while studying at CSU. She also works closely with the Graduate Student Association.

All graduate programs are designed to allow students to take advantage of the many opportunities offered by a diverse research environment with programs that cut across disciplinary, departmental and college boundaries. Coursework centers on anatomy, neuroscience, pharmacology, physiology and reproductive biology. Major research emphases in the Department include ion channel and neurotransmitter receptor structure/function; basic aspects of neurotransmission and nervous system disorders; structure of membrane complexes; biological rhythms; vascular biology; developmental neuro- and reproductive biology; regulatory mechanisms controlling male and female reproductive function; reproductive and neuroendocrinology; assisted reproductive technologies; cardiovascular function; transmissible diseases; and cancer.

Departmental faculty members are major contributors to the Animal Reproduction and Biotechnology Laboratory, a University Program of Research and Scholarly Excellence (PRSE) administered in the Department; and to the Molecular, Cellular and Integrative Neurobiology PRSE. A number of faculty members also participate in the Cell and Molecular Biology PRSE.

As of Fall 2006, there are 35 students participating in the MS-B biomedical sciences program, eight students in the MS-A biomedical sciences programs and 26 PhD candidates. A number of graduate students in BMS programs are supported by training grants from the National Institutes of Health and special endowments established to support graduate education in selected areas. Other students are supported by individual competitive fellowships, support from research grants or teaching assistantships.

Department Introduces Undergraduate Program

For all of its existence, the Department of Biomedical Sciences (and its precursors, the Department of Physiology and the Department of Anatomy and Neurobiology) offered only graduate degrees and provided educational instruction to students in the Professional Veterinary Medical Program and to other students in the life sciences. That changed this year with the introduction of a new undergraduate degree program in biomedical sciences.

"There were quite a few people who were interested in starting an undergraduate program, including faculty members and students," said Dr. C.W. Miller, a Professor in the Department of Biomedical Sciences and director of the undergraduate program. Kelly Swetich is the Undergraduate Professional Advisor. "Task forces recommended creation of the major, and surveys showed a demand. When the College reorganized in 2001, it was time to act on those many recommendations."

Seventy-five students entered the undergraduate program in Spring 2006, most of them currently enrolled, open option in biomedical sciences or life sciences. The program plans to add 75 students each year until it reaches its enrollment cap of 300. Freshman students who apply to the program must meet specific academic requirements to be eligible for admission.

"This is a rigorous curriculum that is oriented to the life sciences," said Swetich. "In the first poll of our students, more than 75 percent indicated they plan on applying to veterinary school or medical school, while the majority of the remaining students plan on continuing in graduate programs or attending other applied health professions schools."

Because of the comprehensive curriculum already offered by the Department or available in the College and University, only one new class was created to fulfill the undergraduate requirements for biomedical sciences. This is the Capstone course that will be required in the senior year. Experiential learning is another important aspect of the major, and students and faculty are encouraged to work together to place students in research facilities and internships. Students themselves already have organized to form the Biomedical Student Association.

"Our undergraduate students are really bringing a lot of energy and enthusiasm to the Department," said Dr. Miller. "We are very excited to have them here and look forward to watching them grow and succeed as they pursue their goals."

For more information on the graduate and undergraduate programs in the Department of Biomedical Sciences, visit www.cvmb.colostate.edu/bms.

Festschrift Symposium Celebrates Life Work of Rupert Amann

In tribute and recognition of his illustrious career, the Animal Reproduction and Biotechnology Laboratory in the Department of Biomedical Sciences is sponsoring a Festschrift Symposium to honor Dr. Rupert P. Amann. "Mammalian Spermatozoa in the 21st Century" will feature lectures from Dr. Amann's colleagues, students and graduates during a two-day celebration of his academic, research and service achievements in animal reproduction. The symposium is scheduled for Dec. 15-16 in the Pathology Building at Colorado State University.

"Dr. Amann's contributions to reproductive physiology are widely regarded as groundbreaking," said Dr. George Seidel, a University Distinguished Professor in the Department of Biomedical Sciences and longtime colleague of Dr. Amann's. Drs. Seidel, James Graham, and Rao Veerachaneni are organizing the Festschrift Symposium. "Dr. Amann has greatly influenced the field of reproductive physiology of the male as researcher, teacher and mentor to many who work in the field today. His many scientific contributions to animal reproductive technologies are used around the world."

A Festschrift (a German word meaning celebration publication) is a book, or in this case a symposium and published proceedings, that contains original contributions by close colleagues and students to honor a respected academic. The presentations in the symposium will be published in book form as an issue of the refereed journal, *Animal Reproduction Science*. The symposium will include 12 presentations on spermatozoa, as well as time for his students to recognize Dr. Amann with anecdotes from their days at Colorado State or Penn State. A highlight presentation will be on "Will There be a Next Generation of Reproductive Scientists?" Dr. Amann also will share his experiences.

Dr. Amann received his master's and doctoral degrees in dairy science from Penn State. After postdoctoral study in Copenhagen, Denmark, he joined the faculty at Penn State and in 1979 was recruited to Colorado State University in what is now the Animal Reproduction and Biotechnology Laboratory. He served as Head of the Department of Physiology from 1989 until he "retired" in 1995 as

Emeritus Professor. His research contributions have continued via two small businesses and activities at Colorado State.

Dr. Amann has received many research awards including the Award for Research in Physiology and Endocrinology from the American Society for Animal Science, Award for Research in Animal Reproduction and Artificial Insemination from the National Association of Animal Breeders, Distinguished Alumnus and Outstanding College Alumnus awards from Penn State, and Distinguished Service Awards from both the American Society of Andrology and the Society for Study of Reproduction.

In 1988, Dr. Amann received the Oliver P. Pennock Award in recognition of five or more years of continuing meritorious service or outstanding achievement at Colorado State University. He also held numerous offices in professional societies, served on advisory and review panels for federal agencies, and served on the editorial boards of several journals. Dr. Amann also was one of the co-founders of the Society for the Study of Reproduction.



Dr. Rupert Amann

For a complete schedule of events for the "Mammalian Spermatozoa in the 21st Century," visit www.cvmbs.colostate.edu/bms/amann_symp.pdf.

Frontiers in Biomedical Sciences Brings Renowned Researcher to CSU

The Frontiers in Biomedical Sciences Series is hosting a visit and lecture on November 8 by Dr. David Albertini, a Professor in the Department of Molecular and Integrative Physiology at the University of Kansas Medical Center.

Dr. Albertini's laboratory employs genetic, molecular and imaging strategies to study basic aspects of the process of reproduction that bear on human disease and its clinical management by stem cell therapy. His overall emphasis is on women's health in relation to causes of human infertility, ovarian cancer, and the deployment of Assisted Reproductive Technologies (ARTS) for improving egg and embryo quality in human and animal models.

The Frontiers in Biomedical Sciences Series was initiated by the Department of Biomedical Sciences three years ago to sponsor outstanding speakers on leading-edge topics in the biomedical sciences that would appeal to large and diverse audiences. The Series is currently jointly sponsored by the Department of Biomedical Sciences, the Program in Molecular, Cellular and Integrative Neuroscience, and the Cell and Molecular Biology Program at Colorado State.

For additional information on the Frontiers lecture, visit the Department's Web site at www.cvmbs.colostate.edu/bms/fibs.htm.



Dr. David Albertini

FRNG Conference

The Front Range Neurosciences Group (FRNG), the local chapter of the National Society for Neuroscience, will hold its annual conference on Monday, Nov. 13, 10 a.m.-7 p.m., at the Fort Collins Marriott.

Keynote speaker for the event is Dr. Stuart Firestein, a Professor in the Department of Biological Sciences at Columbia University. He will present a lecture titled “How the Brain Makes Scents.”

A poster session will showcase the latest in neuroscience research from investigators along the Front Range.

Faculty members in the Department of Biomedical Sciences were instrumental in the creation of FRNG. Members include students and faculty at regional universities as well as other research centers.

For a complete schedule of events, registration, or additional information, visit the FRNG Web site at www.frng.colostate.edu.

Calendar of Events

- Nov. 3-4** Departmental Research Retreat at YMCA of the Rockies. For registration and additional information, visit www.cvmb.colostate.edu/bms/gradretreat_2006.pdf.
- Nov. 8** Frontiers in Biomedical Sciences Seminar Series presents Dr. David Albertini, “Building Better Embryos Through Assisted Reproductive Technology,” 4 p.m., West Ballroom, Lory Student Center. For more information, visit www.cvmb.colostate.edu/bms/fibs.htm.
- Nov. 13** Front Range Neuroscience Group Meeting, 1- a.m.-7 p.m., Marriott Hotel, Fort Collins. For more information, visit www.frng.colostate.edu.
- Dec. 15-16** Festschrift Symposium for Rupert Amann, “Mammalian Spermatozoa in the 21st Century.” For a complete schedule of events and more information, visit www.cvmb.colostate.edu/bms/amann_symp.pdf.
- Dec. 15-16** University Winter Commencement Ceremonies.

Ongoing Events

Physiology Seminar Series – Mondays at 4 p.m. For a complete schedule, visit www.cvmb.colostate.edu/bms/seminar.htm.

Molecular, Cellular and Integrative Neurosciences Seminar Series – Wednesdays at 4:10 p.m. For a complete schedule, visit www.cvmb.colostate.edu/mcin/seminar.

Graduate Student Presentations – Dates and times vary. For a complete schedule, visit www.cvmb.colostate.edu/bms/gradpres.htm.