Creighton University

Faculty Bibliography

2003-2004
NOTE

This edition of the Faculty Bibliography is produced by the Creighton University Graduate School and documents the scholarly accomplishments of University faculty for the 2003-2004 academic year. Included are summary reports showcasing research endeavors taking place throughout the Creighton campus, individual faculty publications and grants, and student dissertations and theses, with acknowledgment to faculty advisors.

We would like to thank Barbara Braden, PhD, Dean of the Graduate School and University College, and Linda Hanson, Assistant to the Dean, for their steadfast support of this ongoing project. Special thanks go to Rev. Don Doll, SJ, for sharing with us the photograph of the Creighton University Jesuit Community and to Chris Petit for providing all other photographs used in this publication.

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CREIGHTON UNIVERSITY FACULTY BIBLIOGRAPHY

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Research Overview

Some examples of the wide variety of research specialties of the faculty are: design and chemical synthesis of analogs of regulatory peptides; the role of peptides in the regulation of gastrointestinal and cardiovascular functions and of bone growth and development; the molecular evolution of peptide hormones; the role of proteolytic enzymes in the biosynthesis of peptide hormones; nucleic acid catalysis and molecular engineering; the molecular biology of collagen synthesis; the regulation of gene expression and molecular diagnostics; the cellular and genetic basis for differentiation of the brain, inner ear, and cardiovascular system; comparative neuroanatomy; cellular mechanics; intracellular electrophysiology; and respiratory mechanics and control.

The research is supported by facilities, including cores for bioimaging, structural bioinformatics, proteomics, genomics, and molecular diagnostics. The department encourages collaborative research interaction with faculty in the Departments of Pharmacology, Medical Microbiology, Medicine, and Surgery; the Osteoporosis, Research Center; the Boys Town National Research Hospital; the University of Nebraska Medical Center; and the Veterans Administration Hospital.

Skin Cancer

The largest organ in the body, the skin, functions as a major sensory organ and to protect the body from exogenous insults. Our research is examining the role of a family of receptor tyrosine kinases in the skin during development and in skin carcinogenesis in response to solar radiation. Members of this receptor tyrosine kinase family include the epidermal growth factor receptor and erbB2/neu, which regulate cell survival, migration, and proliferation. We are investigating the mechanisms of non-melanoma skin cancer development by focusing on the role of erbB2 and the epidermal growth factor receptor in this process. Since non-melanoma skin cancer is the most common form of cancer in the United States, with more than one million new cases diagnosed per year nationwide, this research may have important implications for human health.

Faculty: Laura Hansen, PhD.

Comparative Ion Transport

Research on the ion transport mechanisms that underlie the adaptation of organisms to their environment focuses on the role and regulation of the sodium/hydrogen exchange proteins in yellow fever mosquitoes and the sodium/potassium ATPase in Antarctic fish. Both projects are aimed at identifying the mechanisms of ion transport responsible for the adaptation, including physiological, biochemical, and anatomical measurements; regulation of the ion transport mechanisms by primary and secondary messengers, including analysis of intracellular cAMP, calcium, and pH; and molecular basis for the regulation the ion transporter of interest, including cloning and sequencing of cDNA, mRNA, and protein expression studies.

Faculty: David Petzel, PhD.
Airway Hyperresponsiveness

Research on mechanisms on airway hyperirritability is focused on whether C-fiber endings in reactive airways become hyperirritable, using single nerve fiber monitoring of sensory receptors in airway and parenchyma of small animals. The involvement of neuropeptides in the response of the hyperirritable airway is examined using whole animal nerve recording in vivo and tracheal smooth muscle strips. The pulmonary research also includes pharmacological evaluation of possible therapeutic agents for asthma using whole-body plethysmograph, isolated airway smooth muscle preparations to measure the protection and reversal of airway mediator induced contraction. Changes in reflex control of ventilation and pulmonary sensory receptors of the airway and lung parenchyma during the progression of disease of the lung are also studied.

Faculty: Dale Bergren, PhD.

Cardiac Development

Congenital heart defects are the most common life-threatening birth defect, and many times are accompanied by craniofacial anomalies. In this department, investigators are studying the role of cell-cell and cell-extracellular matrix interactions during normal craniofacial and cardiac development, particularly with regard to neural crest morphogenesis and migration (cells pivotal in the development of both the face and heart). Studies using in situ hybridization, immunocytochemistry, gene miss-expression, enzyme assays, and time-lapse imaging show growth factors, proteases, and protease inhibitors are important overseers of neural crest cell formation and migration. Investigation into the effects of elevated homocysteine on neural crest morphogenesis and mechanisms responsible for folic acid's protective effect on cardiovascular and craniofacial development are also ongoing. In order to develop preventative strategies for congenital defects, we must understand the mechanisms driving neural crest and cardiac morphogenesis and how nutritional elements are involved. These studies also enhance our understanding of adult diseases because many diseases have etiological elements of embryologic origin.

Faculty: Phillip Brauer, PhD.

Circadian Rhythms

Our daily rhythms of sleep and wakefulness are driven and regulated by two small nuclei in the hypothalamus, the suprachiasmatic nuclei. In a brain slice preparation, we are now investigating the cellular mechanisms of circadian rhythm regulation and how circadian rhythms are modulated by the brain hormone melatonin.

Faculty: Richard Hallworth, PhD.

Ear Development

The inner ear contains two important sensory modalities: the vestibular system for orientation in space and the auditory system for hearing. Progress in recent years has been dramatic regarding the molecular governance of ear development, the pathways of innervation in this organ, and the genetics of hearing-related disorders. Our research focuses on mouse mutations that cause developmental ear defects and those that affect either the formation or the maintenance of sensory neurons in the hearing or vestibular systems. This research will enable us to understand the molecular machinery that makes and brakes ear formation, especially the innervation. In a parallel avenue, we
are investigating the activity-dependent connectional dynamics. For this we make use of micro- and hypergravity exposure as well as several neurotrophin mutant mice with altered connections. This research is conducted in collaboration with Boys Town National Research Hospital, Millennium, Regeneron, and various universities. It is funded by NASA and NIDCD.

Faculty: Kirk Beisel, PhD; Laura Bruce, PhD; and Bernd Fritzsch, PhD.

Hearing Loss

Hair cells are the essential first step in hearing, and damage to hair cells is the cause of age-related and traumatic hearing loss. In work funded by the National Institutes of Health, the basic science of hair cells and the mechanisms underlying their loss are being studied, with a view to finding rescue and repair methods. This work is being pursued in collaboration with investigators at Boys Town National Research Hospital, Harvard University, Baylor College of Medicine, St. Jude's Hospital in Memphis, University of Colorado at Boulder, University of Texas at Austin, University of Texas Health Science Center at San Antonio, University of Maryland, Oregon Health Sciences University, and Boston University.

Faculty: Kirk Beisel, PhD; Bernd Fritzsch, PhD; and Richard Hallworth, PhD.

Molecular Biology of the Inner Ear and Hereditary Deafness

The mouse inner ear offers an excellent paradigm to characterize and analyze the functional genomics of unique and rare cell types in the inner ear. These include inner hairs cells, outer hair cells, inner phalangeal, border cells of the inner sulcus, pillar, Deiters’, Hensen’s and Claudius’ cells. Gene discovery and differential expression will focus on global expression analysis using microarray analyses in combination with null and spontaneous mutant mice. Quality assessment of these cDNAs will be accomplished by using in silico microarray analyses to detect expression of ion channel genes, rare to common housekeeping genes, developmentally expressed genes, cell-specific genes of the OC, and genes expressed in only non-sensory/non-neuronal cells. Using bioinformatics approaches candidate genes for hereditary deafness will also be identified. One component of the research program will also focus on the development and testing of genetically engineered mouse mutant lines to determine and molecularly dissect the structure functional relationship of the altered genes in normal and dysfunctional auditory responses. This research is conducted in collaboration with Boys Town National Research Hospital, RIKEN, National Institutes of Health, University of Iowa, and various other universities. It is funded by NIDCD.

Faculty: Kirk Beisel, PhD.

Biophysics of Cochlear Hair Cells

The outer hair cell (OHC) is one of two kinds of receptor cells in the inner ear, and plays a critical role in mammalian hearing. OHCs enhance basilar membrane motion through a local mechanical feedback process within the cochlea, termed the “cochlear amplifier.” It is generally believed that the basis of cochlear amplification is a voltage-dependent somatic length change of OHCs. In this scheme, receptor potentials produced by transducer current in response to acoustic stimulation provide the input to the cell’s motor activity. Consequently, the OHC is thought to perform two transducer functions, a conventional mechanoelectrical or forward transduction in the stereocilia, and a specialized electromechanical or reverse transduction in the basolateral membrane. Funded by the NIDCD, research in the laboratory focuses on the two transduction processes in OHCs. Recordings
are made from isolated hair cells, cultured hair cell preparations, and hemicochlea, in conjunction with molecular, morphological, and other novel techniques to investigate properties of these cells and their roles in cochlear function in mammals. The research is conducted in collaboration with Northwestern University, Harvard University, NIDCD, and St. Jude Children’s Research Hospital. Faculty: Richard Hallworth, PhD; and David Z. Z. He, PhD.

Development of Cochlear Hair Cells

One of the central questions in developmental neurobiology of the sensory systems is how the receptor cells develop and whether their development is regulated by innervation. Research in the laboratory focuses on the development of cochlear hair cells. Specifically, we want to determine when somatic motility, membrane conductances, and ACh receptor of outer hair cells develop. Recordings are made from solitary hair cells isolated from developing animals. Tissue culture technique has also been used to address the question of whether the maturation of hair cells is regulated by innervation. The research is funded by the NIDCD. Faculty: David Z. Z. He, PhD.

Control of Gene Expression

This research is centered on the developmental regulation of hemoglobin gene expression with correlative gene therapy approaches. The mechanism by which transcriptional regulatory proteins are involved in switching the various hemoglobin genes on and off at different stages of development is being studied. The results from these investigations will contribute to knowledge of red cell maturation and disease states which result from gene defects. New gene therapy vectors which are erythrocyte specific and use endogenous retrotransposons, which are expressed in red blood cells, are being developed. This is a novel gene therapy approach to genes in target cells, which have long-term expression capabilities as well as tissue specificity. Faculty: Joseph Knezetic, PhD.

Molecular Genetics of Hereditary Cancers

This research is focused on finding mutations at the DNA sequencing level for various hereditary cancer patient families. Studies so far have shown that each family has unique mutations causing the cancers. The laboratory facilities used for the work have been developed into a Molecular Diagnostic Laboratory which is fully accredited by the Clinical Laboratory Improvement Amendments (CLIA) and certified by the College of American Pathologists (CAP). This laboratory examines patient DNA samples for known mutations in each family and provides reports for subsequent genetic counseling. WAVE - dhpcl technology and CHIP instrumentation is being used to assay for new mutations in families where the original causative mutation has yet to be determined. Faculty: Joseph Knezetic, PhD.

Engineering RNA Catalysts

This research is focused on development of controllable RNA catalysts as genetic regulatory switches and cellular biosensors. These catalysts, termed allosteric ribozymes, require the binding of specific effector molecules to elicit activity and are generated using rational design and in vitro evolution strategies. The ability of allosterically self-cleaving ribozymes and self-splicing introns to regulate gene
expression is of particular interest. Toward this goal, model systems for yeast and mammalian cells are presently being developed. Moreover, such catalysts afford a unique opportunity to investigate the structural dynamics of RNA folding and ligand interaction.

Faculty: Garrett Soukup, PhD.

Osteoporosis

Collaboration between Creighton faculty in the Departments of Biomedical Sciences and Internal Medicine focuses on osteoporosis and the cellular basis of how skeletal mass is achieved and maintained: bone mass changes in response to varying loads - disuse reduces and heavy use increases bone density; how loads placed on the skeleton are detected and converted into biological signals that affect the balance between bone formation and resorption is not understood. Studies currently underway use bromodeoxyuridine to characterize the proliferation and differentiation of osteoprogenitor cells in response to biomechanical loading in adult rats. The role of prostaglandin E (PGE) as a local mediator of loadinduced bone formation is also being evaluated. Another project is designed to elucidate how smoking tobacco reduces bone mass and increases the risk for osteoporosis. This project combines an assessment of bone structure, strength, and cell function using in vivo and in vitro models.

Faculty: John Yee, PhD.

Cell Mechanics

It has long been known, but not widely appreciated, that light exerts force on living tissue. Intense laser light can be harnessed to produce a novel method, called the optical stretcher, for the measurement of the mechanical properties of single cells. In a joint project of the Department of Biomedical Sciences, the Osteoporosis Research Center, and the Creighton University Physics Department, an optical stretcher facility will be constructed in the Department of Biomedical Sciences in the coming year. Initial studies will address the mechanics of hair cells of the inner ear, the mechanism by which bone density is regulated by osteocytes, and the mechanisms underlying photodynamic therapies. This work is being pursued in collaboration with the University of Texas at Austin and the University of Leipzig, Germany.

Faculty: Richard Hallworth, PhD.

Control of Appetite and Digestion

Our research focuses on the question: How does the gastrointestinal tract communicate with the brain to control food intake and energy reserves (adiposity; body weight)? Meal initiation is typically preceded by sensations of hunger and followed by sensations of fullness and satiety, which affect the timing of meals and amount of food consumed. Various gastrointestinal hormones and nerves are postulated to play important roles in conveying information to the brain about the quantity and quality of food consumed. Less is known about the brain substrates that receive this information, produce hunger and satiety sensations, and regulate adiposity. Our research specifically focuses on the role of various gastrointestinal peptides (cholecystokinin, amylin, peptide YY(3-36), glucagon-like peptide-1, ghrelin) and nerves (vagus) in control of food intake, gastric emptying, and body weight. Most of our studies use the rat as an experimental model. Rats are prepared with chronic indwelling cannulas in specific areas of the gastrointestinal tract, vascular system, and/or brain for computer-controlled delivery of test substances and withdrawal of blood. Food intake and meal patterns are
determined from continuous computer recordings of changes in food bowl weight. Many of the peptides and peptide antagonists are synthesized either locally in the VA Peptide Core Facility or by Dr. Martin Hulce in the Department of Chemistry at Creighton University. Our research is supported by the Medical Research Service of the Department of Veterans Affairs, the National Institutes of Health, and the National Science Foundation.

Faculty: Roger Reidelberger, PhD.

Regulatory Peptides

Structure-activity relationships of selected regulatory peptides are examined using synthetic peptide chemistry, physical, chemical and computerized theoretical analysis of conformation and biological characterization of activity.

◊ Studies on the interactions of antimicrobial peptides with the chaperone protein DnAK, using MD simulations, revealed the interaction site on the protein and a possible basis for antimicrobial action and design of new peptide-based antibiotics.
  Faculty: Sándor Lovas, PhD.

◊ Studies of gastrin and gastrin gene-products are focused on their significance in colonic cancer and on a novel receptor for carboxymethyl gastrin which mediates promotion of growth of the cancer cells.
  Faculty: Sándor Lovas, PhD; and Richard F. Murphy, PhD.

◊ Studies of variants and derivatives of gonadotrophin releasing hormone variant, GnRH III, have led to development of a conjugate of the peptide with a synthetic polymer. This suppresses growth of cancers, including breast and colonic, which have receptors for the hormone. The technology is being optimized for therapeutic application.
  Faculty: Sándor Lovas, PhD; and Richard F. Murphy, PhD.

◊ Studies of the EGF-TGF family of peptides revealed the importance of domain movement by hinge bonding and the discrete biological activity of a B-loop partial structure which may have a novel receptor requirement.
  Faculty: Sándor Lovas, PhD; and Richard F. Murphy, PhD.

◊ Studies of the vasodilatory neuropeptide, calcitonin gene-related peptide (CGRP), have led to the development of the most potent, peptide-based CGRP antagonists reported to date. These will be useful for determining the physiological role of CGRP and the design of therapeutics for treatment of hypertension and migraine.
  Faculty: D. David Smith, PhD.

Structural Bioinformatics and Proteomics

Eighteen Alpha cpu-based and 80 Athlon cpu-based clusters are used to study conformational properties of peptides proteins and the effect of weakly polar interactions on peptide and protein structures by Molecular Dynamics simulations, bioinformatics, and high level quantum chemical calculations.

Faculty: Sándor Lovas, PhD; and Richard F. Murphy, PhD.
**Protein Processing**

Communication between cells of the nervous, endocrine, and immune systems is frequently conducted through biologically active peptides. Many of these peptides are initially synthesized as larger, inactive propeptides which are subsequently cleaved by extremely specific endoproteases. The structural basis for this specificity is unknown. We are presently examining the processing of proinsulin and proglucagon by the converting enzymes PC1 and PC2, in an attempt to uncover clues to the specificity of substrate recognition. The ultimate goal of this work is to describe, at the molecular level, those interactions for the differential processing of peptide hormones.

*Faculty: Robert Mackin, PhD.*

**Bioimaging**

The Nebraska Center for Cell Biology in the Department of Biomedical Sciences this year obtained a Zeiss multi-photon confocal microscope. Investigators in the department and other departments of the Medical School, and from Boys Town National Research Hospital, are using the instrument to extend their knowledge of the inner workings of cells.

*Faculty: Bernd Fritzsch, PhD; and Richard Hallworth, PhD.*

See the Biomedical Sciences webpage for additional information about the department’s current research activities: [http://www.biomedsci.creighton.edu/research/areas.htm](http://www.biomedsci.creighton.edu/research/areas.htm)

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**CANCER**

The Creighton University Medical Center – Cancer Center was established in the summer of 2002 under the direction of Dr. Brian W. Loggie. The main goals of the Cancer Center are: 1) to cover basic cancer services, develop areas of excellence or distinction, and provide specialty niches of care not currently provided in the Omaha metro and region, and 2) to establish premier programs in basic research (where scientists learn about basic cellular events in cancer), translational research (which moves science to the bedside and identifies clinical problems to take back to the laboratory), and clinical research (where new therapies are made available in a system of ongoing study, oversight, and review).

The theme of the basic and translational research at the Cancer Center is signal transduction, also known as molecular signaling. During the 2003-2004 academic year, research was fully supported by funding from the National Institutes of Health, Department of Defense, American Cancer Society, and Cancer and Smoking Disease Research Programs (LB595 and LB692). In the Fall of 2004, the Cancer Center moved into newly renovated laboratories, consolidating several smaller labs throughout the Criss complexes. The Cancer Center is proud of its state-of-the-art molecular biology and immunohistochemistry laboratories. Additionally, patents are pending in three separate areas of cancer research.
The basic science faculty consists of Zafar Nawaz, PhD; Zhao-yi Wang, PhD; Venkatesh Govindarajan, PhD; and clinical faculty consists of Brian Loggie, MD and Edibaldo Silva, PhD, MD. The laboratory fully supports six post-doctoral fellows, a research associate, and three laboratory technicians.

**Faculty-Researchers**

**Brian Loggie, MD.** Professor of Surgery, is Chief of Surgical Oncology and Director of the Cancer Center. Dr. Loggie has established a center for the treatment of peritoneal neoplastic disease. Patients from virtually every state have been evaluated and treated at the Cancer Center for a variety of conditions including pseudomyxoma peritonei (PMP), peritoneal carcinomatosis, appendix cancer, and peritoneal mesothelioma. Translational research at the Cancer Center has already lead to national and international presentations. Dr. Loggie has broad clinical experience in surgical oncology and in clinical and translational research in cancer.

**Edibaldo Silva, PhD, MD**, Associate Professor of Surgery, is the Program Director for the Breast Clinic and the Melanoma and Skin Cancer Clinic. Additional areas of expertise are in gastrointestinal malignancy, pancreatic cancer, sarcoma, and thyroid and parotid tumors.

**Zafar Nawaz, PhD.** Associate Professor of Surgery, is the Director of the Cancer Center Molecular and Cancer Biology Laboratory. He is a renowned expert in estrogen receptor function. Dr. Nawaz is studying signal transduction and cell processes of tumor growth in breast, prostate, lung, and colon cancer.

**Zhao-yi (Charlie) Wang, PhD.** Associate Professor of Surgery, is studying the molecular and cellular mechanisms underlying estrogen-stimulated mammary tumorigenesis and breast cancer progression. Dr. Wang has been studying the roles of tumor suppressors such as BRCA1 and WT1, and RbAp46, a novel gene he identified, in early development of human breast cancer using a xenograft model.

**Venkatesh Govindarajan, PhD.** Assistant Professor of Surgery, joined the Cancer Center in February of 2004. Dr. Govindarajan is a developmental biologist from Baylor School of Medicine who brings expertise in cell signaling and special investigational techniques that will be applied to cancer research. He is studying the role of fibroblast growth factor (FGF) signaling pathway in regulation of basic cellular processes, such as proliferation and differentiation of ocular and skeletal tissues, and to understand how deregulation of this signaling pathway leads to tumorigenesis. His lab is also focused on generation of transgenic mouse models for the study of mesothelioma and ocular and skin tumors.

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**Fine and Performing Arts**

Members of the Department of Fine and Performing Arts extend the concept of teacher-scholar to incorporate the role of artist. Faculty members pursue activity in each of these areas, with regional, national, and international recognition.
Notable artistic achievement within the visual arts is witnessed by invited participation at regional and national exhibitions as well as the inclusion of work in various museum and gallery acquisitions. Recent faculty projects have included significant commissions of two- and three-dimensional pieces. Additionally, faculty are engaged in photographic imaging in 19th century historical techniques (e.g., platinum, palladium, iron, and silver salts), glass-casting, printmaking, drawing, ceramics, and visual imaging made possible through emerging technologies. Faculty routinely supervise student exhibitions throughout the area and encourage student participation in local, regional, and national professional artistic organizations.

Performing artists are active in dance, theatre, and music. Among recent faculty achievements are appearances at a variety of venues, including award-winning dramatic roles on Omaha stages. Work associated with costuming, make-up design, and technical theatre has been critically acclaimed in productions throughout the region. During the past year, music faculty have appeared with numerous Omaha-based organizations (e.g., the Omaha Symphony and Mannheim Steamroller) and in various international venues. Additionally, most performing artists annually direct, conduct, and supervise student productions, concerts, and recitals. Adding to the department's complete collection of Javanese court gamelan instruments, unique within the State of Nebraska, is the first set of Surinamese gamelan instruments found in the United States.

Scholarly work includes traditional academic research as well as arts-specific activity. Music faculty have received commissions for new musical scores and presented papers at professional society conferences. Additionally, music faculty are engaged in the production of pedagogical texts as well as production of compositions appropriate to graded dance curricula. Dance faculty are not just highly sought performers but choreographers, adjudicators, and pedagogues as well, with numerous appearances and works evidenced in the United States and abroad. Theatre faculty projects include direction and video/broadcast production. Art historians are engaged in both curatorial and scholarly work. Additionally, research associated with the University Gallery has resulted in the selection and presentation of exhibits routinely reviewed by regional critics.

Departmental faculty are committed to sharing their work and craft as artists within various educational settings. Professional activity for departmental members includes participation as jurors, reviewers, judges, clinicians, and presenters for local, regional, and national arts councils, workshops, evaluations, and conferences. The artist-faculty of Fine and Performing Arts believe their work is best described by the departmental mission statement: “We believe in the value of the arts as the voice of the human soul. The arts educate, communicate, and inspire us to know more about ourselves, each other, and our place in creation. We believe in the unity of the arts and in the crucial role of arts in education.”

**Health Policy and Ethics**

The Center for Health Policy and Ethics is a multidisciplinary group of scholars dedicated to the study and teaching of ethical dimensions of health care and health policy. Scholarship at the Center responds to the challenge of ethical issues raised by the health care system, patient care, and public
health. The multidisciplinary nature of the Center encourages a variety of perspectives and resources for topics of scholarly inquiry, conceptual analysis, and discussion. The research interests of the faculty of the Center reflect the stereoscopic vision implied in its name — the ethics of health policy and health care. Global topics of public policy as well as the traditional details of clinical decision making are addressed.

Areas of sustained research are: (1) ethical issues at the end of life, palliative care and chronicity; and (2) issues of justice, especially those dealing with the marginalized in the health care system. For example, in the early 1980s the Center was one of the first to take on the monumental issue of confidentiality in HIV/AIDS, just as the issue had begun to emerge on the national level. The Center's work with colleagues from Eastern and Western Europe resulted in an edited book entitled *Ethical Foundations of Palliative Care for Alzheimer's Disease* (Ruth Purtilo, PhD and Henk ten Have, PhD, editors), published by the Johns Hopkins University Press. It represents one product of a multidisciplinary international conference convened by the Center in 2001. The organization and contributions involved all members of the Center. The book focuses on the economic, clinical, and ethical and social challenges in the treatment of Alzheimer's disease globally. The Center was also involved in planning and implementing the Dreamcatchers Conference, a national working group of experts in occupational and physical therapy. From this workgroup, a book of contributed papers was assembled, *Educating for Moral Action: A Sourcebook in Health and Rehabilitation Ethics* (Ruth Purtilo, PhD, Gail Jensen, PhD, and Charlotte Royeen, PhD, editors) to be published by F. A. Davis in 2005. In response to the scarcity of literature on health sciences education in Jesuit universities, Jos Welie, PhD and Judith Lee Kissell, PhD edited the book, *Jesuit Health Sciences and the Promotion of Justice: An Invitation to a Discussion*, published by Marquette University Press.

Issues of health policy and ethics will continue to demand scholarly inquiry and public attention. Critical concerns about ethics education will require closer examination of student learning and outcomes. The health care system will continue to develop, and these changes will inevitably lead to new moral considerations. Faculty at the Center will continue to make important contributions in these challenging areas as they have done significantly in the past.

For additional information about the Center for Health Policy and Ethics, visit the Center's webpage at: http://chpe.creighton.edu.

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**JESUIT COMMUNITY**

◊ *Rev. Phil Amidon, SJ* is currently translating a fifth-century Church history and assisting with linguistic research on the translation of letters of Cyril of Alexandria.

◊ *Rev. Raymond Bucko, SJ* is currently researching topics in the history of anthropology: action anthropology; Jean Francois Lafitau, SJ; Eugene Buechel, SJ; and the history of research on the ghost dance. He also is researching the ethnographic collection assembled by Fr. Buechel, SJ of Lakota material culture. He is editing and amplifying an interpretive display of Lakota bows and arrows as well as researching Lakota war charms and Lakota parflech designs. He
continues to research the history of liturgical adaptations made during the annual Tekakwitha Conference and anthropological and theological issues of inculturation in Catholic ritual practice.

◊ **Rev. Don Doll, SJ**, Professor of Journalism, will be photographing for the Jesuit Refugee Service to document their world-wide activities. He will also be researching in the Wisconsin Province Jesuit Archives in St. Louis, Missouri, for a photographic history of the province. He will also research and produce photographs for an exhibit on the first Jesuit parish founded in 1620s in Port Tobacco, MD. He will also photograph student dancers in their regalia at Red Cloud Indian School in Pine Ridge, SD as well as St. Augustine's Indian School in Winnebago, NE for each school's 2006 fund-raising calendar.

◊ **Rev. Robert Fitzgerald, SJ**, a Creighton University Medical Center Chaplain, is part of a group researching how chaplains themselves deal with spiritual pain in patients and their families. In May, he will be part of a symposium entitled “A Day in the Life of a Hospital Chaplain.”

◊ **Rev. Dennis Hamm, SJ**, of the Theology Department, is currently researching the source (and non-Biblical) nature of the doomsday scenario expressed in the popular *Left Behind* series of novels by Tim LeHaye and Jerry B. Jenkins. With three other members of the Theology Department (Professors Calef, Roddy, and Weber), he has also been working on the production of “Kairos: Biblical Education and Reflection for the Lenten Season,” writing and recording eleven audio tracks on “Stories Jesus Told: Hearing the Parables Afresh.” He is also researching Biblical options for presenting Ignatius’ idea of “the Passion of the Christ” in the Third Week of the Spiritual Exercises. He has recently completed research for commentary on the *Acts of the Apostles*.

◊ **Rev. J. William Harmless, SJ**, of the Theology Department, is conducting research on a new book, *Mystics: What They Can Teach Us About God, Prayer and Our Hard-To-Read Heart*, based on a lecture series given at John Carroll University in the fall of 2003. He is also bibliographic editor for the forthcoming English edition of Hubertus R. Drobner’s *Lehrbuch der Patrologie* for which Bill translated 175 pages of bibliographic entries on all the Church
Fathers and on early Christian history. He is also editing a new 250-page *Augustine Reader*, designed for use for undergraduate courses on Augustine and early Christianity.

◊ **Rev. Richard J. Hauser, SJ**, Rector of the Jesuit Community, is revising a book manuscript on ecumenical spirituality. The project involves reorienting his spirituality synthesis to connect directly with foundational Protestant themes. He is also researching an article on a contemporary approach to Ignatian discernment of spirits.

◊ **Rev. Charles Jurgensmeier, S. J.,** of the Fine and Performing Arts Department, is currently researching toward the writing of two articles for the *Choral Journal*. The first deals with the history of the Concert Mass, and the second is on the choral works of the Benedictine monk and composer, Johann Valentin Rathgeber (1682 - 1750). He is also preparing for a solo recital this spring, performing cantatas by J. S. Bach and Vivaldi.

◊ **Rev. Charles Kestermeier, SJ**, who works with both the English Department and Campus Ministry, continues to amplify his complete, up-to-date, on-line annotated bibliography on Raymond Queneau, a modern French author. He also edits an on-line bulletin on Queneau which appears every four to five months. In mid-October, he will have completed the first ten years of this bulletin.

◊ **Rev. Lee Lubbers, SJ** is writing the history of SCOLA. The main emphasis is the key role of languages in person-to-person relations and cooperation essential for bringing smaller, "out-of-the-way" countries quickly into the "functioning core" of trading nations in effective globalized interaction.

◊ **Rev. Thomas S. McShane, SJ**, of the Physics Department, is one of three Creighton faculty members working on the STAR Project. STAR is one of two large detector systems in the Relativistic Heavy Ion Collider at Brookhaven National Laboratory on Long Island, NY. The long-term goal is to recreate and detect a quark-gluon plasma, a form of matter that has not existed in our universe since a billionth-of-a-billionth of second after the Big Bang occurred.

◊ **Rev. John Montag, SJ**, Chaplain and Assistant to the Dean of the College of Business Administration, is working long-term on researching the ways in which Jesuit religious life and the various formative Jesuit documents (Constitutions, Exercises, Ratio) shaped and influenced higher education in later centuries, not only through Jesuit institutions, but through any institutions with which Jesuits had some interaction. He is also preparing sections of his dissertation on Francisco Suarez, SJ and the early-modern academic redefinition of theology and philosophy for publication as articles.

◊ **Rev. Roc O’Connor, SJ**, who works with the Theology Department and Campus Ministry, is in the final stages of a book proposal that deals with the topic of "Full, Active, and Conscious Participation" in the Roman Catholic liturgy. He is also researching the role of the psalms in the Liturgy of the Hours and how they proclaim and invite people to participate in the Paschal Mystery. It will be published in the summer of 2006 in *Liturgical Ministry* magazine. He has also recently concluded research on a presentation for the Catholic Campus Ministry Association that focused on describing criteria for the theological adequacy of lyrics of Entrance songs/hymns for the Roman Catholic liturgy.
Rev. John “Jack” Zuercher, SJ continues his research and praxis on the process of discernment or finding God's will as found in *The Spiritual Exercises of St. Ignatius*. He also continues his research on the spirituality of Anthony DeMello, SJ.

Please visit the webpage of the Creighton University Jesuit Community at: http://magis.creighton.edu/cujesuits/

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**LAW**

Now over 100 years old, the Creighton University School of Law has a rich tradition of contributing to the fund of legal knowledge.

At one time, the bulk of academic legal writing was practice-oriented, and early on the writings of Creighton faculty reflected this prevailing trend. In more recent times, however, Creighton faculty have contributed both practically and theoretically oriented works to the legal literature.

Creighton law faculty have authored casebooks, treatises, and monographs with national commercial and academic publishers. Faculty articles have been published in law reviews throughout the nation as well as contributing works that directly influence policy and law, such as model jury instructions. Faculty writings also bridge the gap between law and other disciplines, including economics, medicine, and political science.

The goal of Creighton Law School’s research conforms to the University’s stated mission of enhancing teaching, discovering new and broader knowledge, and contributing to the betterment of society.

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**MEDICAL MICROBIOLOGY AND IMMUNOLOGY**

**Research Overview**

The Department of Medical Microbiology and Immunology consists of thirteen PhDs and four MDs with primary appointments and six PhDs and four MDs with secondary appointments. The department is multi-institutional, encompassing the Creighton University Medical Center (CUMC), the University of Nebraska Medical Center (UNMC), Children’s Hospital, and the Veterans Administration Medical Center (VAMC).

The research programs of the department are multi-disciplinary, with expertise in a variety of areas broadly related to medical microbiology and immunology. In addition, collaboration with faculty of other departments within Creighton University School of Medicine, the Veterans Administration
Hospital, the University of Nebraska at Lincoln, and the University of Nebraska Medical Center provides an opportunity for innovative research opportunities and supports an integrated graduate program. These collaborative efforts include research in the general areas of antimicrobial agents and chemotherapy, molecular biology, genetics, immunology, microbial toxins, virology, bacterial pathogenesis, diagnostic and clinical microbiology, adult infectious diseases, epidemiology, microbial physiology, and nosocomial infections. The range of research interests extends from clinical trials to test the efficacy of antimicrobial agents to the basic aspects of cellular and subcellular microbiology. The diversity of faculty research interests and scientific pursuits, including a listing of publications and research grants in progress, is summarized in the individual faculty bibliographies.

Major areas of emphasis within the department include:

**Infectious Disease**

Overall, the Infectious Disease Division provides clinical services in four broad areas: clinical infectious disease consultations, laboratory management, infection control services, and advisory support to public health agencies and organizations. Patient consultations are provided by the adult disease services at several regional hospitals. The adult service is under the direction of Gary Gorby, MD and provides all adult (nineteen years and older) inpatient and outpatient consultations at the Creighton University Medical Center and the Veterans Administration Medical Center-Omaha. Members of the department provide consultation in infectious disease at each of these institutions. Research interests within the division include the pathogenesis of bacterial infections and the prevention of nosocomial infections.

*Faculty:* Marvin Bittner, MD; David Dworzack, MD; Martha Gentry-Nielsen, PhD; Donald Giger, MD; Gary Gorby, MD; and Laurel Preheim, MD.

**Center for Research in Anti-Infectives and Biotechnology (CRAB)**

The Center for Research in Anti-Infectives and Biotechnology (CRAB) is an association of researchers within the Department of Medical Microbiology and Immunology, Creighton University School of Medicine. The research interests of the center include many aspects of antimicrobial chemotherapy ranging from drug discovery to studying the molecular mechanisms of antibacterial resistance among bacteria, solving problems of detecting antibacterial resistance in the clinical laboratory, and evaluating new drugs and novel drug combinations to effectively treat resistant bacteria. CRAB faculty have been studying the super-bug strains that are resistant to antibiotics.

The members of the center include specialists in clinical microbiology, molecular biology, and pharmacodynamics. In addition to research endeavors, members of CRAB are active in the teaching of many courses within the Schools of Medicine, Dentistry, and Pharmacy and Health Professions. Courses taught include medical microbiology and immunology, and antimicrobial agents and chemotherapy. The center associates also teach a summer “minicourse” in antimicrobial agents and chemotherapy to pharmaceutical and industry professionals.

*Faculty:* Nancy Hanson, PhD; Philip Lister, PhD; and Kenneth Thomson, PhD.
Flow Cytometry Core Facility

The Creighton University Flow Cytometry Core Facility is located in and administered by the Department of Medical Microbiology and Immunology. The facility was established in 2001 to serve research investigators of any department at Creighton University and Boys Town National Research Hospital, as well as outside (such as Omaha Children’s Hospital). Within Creighton, the facility routinely provides service to investigators in Medical Microbiology and Immunology, Biomedical Sciences, Allergy and Immunology, Cardiology, and Psychiatry.

The centerpiece of the facility is a Becton Dickinson FACSCalibur dual laser, 4-color flow cytometer. This instrument is equipped with both optional sorting capabilities and a Multiwell Autosampler. A separate computer workstation is available in the facility for off-line data analysis using any of several advanced data analysis packages available in the facility.

In addition to the FACSCalibur, the facility houses a Beckman Coulter Z1 particle counter, a Nikon E-400 microscope and an IEC Centra-GP8R refrigerated centrifuge. The cell purification/sorting capabilities of the facility have been significantly enhanced through the purchase of two magnetic separation units (VarioMACS and QuadroMACS) from Miltenyi Biotec. Through the use of monoclonal antibodies and magnetic beads, these units allow the purification of specific cell populations for further analysis or cell culture. All of these additional items are also available for use by any investigator.

Faculty: Patrick Swanson, PhD; Technical Director: Greg Perry, PhD.

Immunology Research

Within the Department of Medical Microbiology and Immunology, Kristen Drescher, PhD heads studies on multiple sclerosis. Dr. Drescher has developed a unique research technique in an effort to halt the progression of damage in the central nervous system that leads to MS. Her research is attempting to alter the immune systems of mice undergoing the disease processes associated with MS to determine whether changes in the animal’s mobility and lesion development in the central nervous system can be reduced. Through the use of a virus-based test vaccine, Dr. Drescher is studying the process of demyelination, or damage to the myelin sheaths that surround nerve fibers.

Another area of research within the department is the understanding of how the immune system adapts to combat foreign agents. Patrick Swanson, PhD is researching the V(D)J recombination process that assembles genes that encode antigen receptors on lymphocytes to produce disease-fighting antibodies and T-cells. Dr. Swanson has made progress in understanding how RAG proteins bind and cut DNA and has generated transgenic mice expressing mutant forms of RAG-1 to examine aspects of lymphocyte development. Through this research, Dr. Swanson hopes to learn how mutations in the RAG or other proteins involved in V(D)J recombination could lead to human diseases stemming from impaired V(D)J recombination such as severe combined immunodeficiency (SCID) or apparent gene rearrangement such as certain lymphomas and leukemias.

Faculty: Kristen Drescher, PhD, and Patrick Swanson, PhD.
Prion Research

Prion diseases are a group of fatal neurodegenerative diseases that affect humans (e.g., Creutzfeldt-Jacob disease) and animals (e.g., chronic wasting disease). Prion diseases have long subclinical incubation periods of months to decades with a short clinical phase that is characterized by the onset of behavioral, cognitive, or motor deficits. Deposition of the abnormal form of the prion protein, PrPSc, in the central nervous system (CNS) results in neuronal loss and onset of clinical symptoms. Outside of the CNS, PrPSc deposition occurs in the peripheral nervous system and secondary lymphoreticular system (LRS) tissues such as spleen and lymph nodes. All prion diseases of animals and a majority of prion diseases in humans are due to prion exposure by a peripheral route (e.g., ingestion). Details of the mechanism(s) of prion transport to the CNS are poorly understood. To better define prion transport to the CNS the lab is investigating three areas of prion pathogenesis. First, researchers are exploring alternative routes of prion entry into the host in an attempt to better define the possible routes that prions can gain access to the CNS. Second, we are investigating the role of the innate immune system in processing and transport of prions to secondary tissues. Finally, we are interested in factors that influence susceptibility of neurons to prion infection and/or replication. The understanding of routes and mechanisms of prion transport will enhance the future development of therapeutic interventions to prevent prion spread to the CNS.

Faculty: Jason Bartz, PhD.

MEDICINE

The faculty and laboratories in the Department of Internal Medicine had many accomplishments in the 2003-2004 academic year. The Department of Medicine faculty received numerous awards from both federal and non-federal research funding sources. The department’s productivity is manifested by the fact that 35 percent of all research dollars awarded to Creighton University in 2003-2004 were due to funding of Internal Medicine faculty. The leading divisions for research productivity were Endocrinology and Allergy/Immunology. Investigators receiving the most awards for this year included Drs. Robert Recker, Christopher Gallagher and Marc Rendell in the Division of Endocrinology, and Drs. Thomas Casale and Devendra Agrawal in Allergy/Immunology.

Collaborative investigation continues to be a major theme in the department research efforts. The Divisions of Rheumatology, Dermatology and Allergy/Immunology have collaborated on several clinical research protocols examining the role of immunomodulators for inflammatory diseases. The Division of Cardiology continues to conduct many clinical studies related to the treatment and prevention of cardiovascular diseases. Dr. Mohiuddin and his colleagues have also been productive in examining better ways to study and deliver health care to underserved populations. The Hematology and Oncology Division continues to be very active in clinical research, especially through their interactions with the Missouri Valley Cancer Consortium. The Division of Pulmonary and Critical Care Medicine is conducting clinical trials aimed at treating respiratory diseases. These efforts have been especially productive with the recruitment of Dr. Lee Morrow. The Nephrology Division is collaborating with the Endocrinology Division in supporting the bench-related research by
Dr. Richard Lund. In addition, many faculty members have been invited to give research lectures at national and international meetings and have received special recognition by universities and specialty societies. The General Internal Medicine Division has continued to be among the leaders in a variety of educational research projects, including nationally led studies on the effectiveness of clinical teaching. All of these efforts have led to an increased number of peer reviewed publications for the faculty, as well as state-of-the-art review articles and chapters.

Cardiology

The Division of Cardiology continues to build upon its commitment to provide superior clinical services, participation in sponsored clinical research, and community focused intervention programs. Under the direction of Syed Mohiuddin, MD, The Cardiac Center has continued to expand its clinical operations and research activity. The Cardiac Center provides referring physicians, healthcare professionals, patients and their families with the opportunity to use the area's only freestanding facility totally dedicated to cardiovascular research and education, risk modification, diagnosis, and treatment. Services at The Cardiac Center include: physician evaluation and management, electrocardiography, x-ray, exercise testing, echocardiography including Transesophageal (TEE), Implantable Cardiac Defibrillator (ICD) and pacemaker management, cardiac catheterization and percutaneous interventions, pharmacologic interventions (including the availability of compassionate drugs), laboratory services, risk reduction education, and smoking cessation services.

Clinical Operations. The Cardiac Center strives to make available the most current technologies in treatment methods and diagnostic tools. Brachytherapy (radiation therapy) and drug-eluting stents have been added to our list of interventional strategies to treat narrowing or occluded coronary vessels and prevent restenosis. Enhanced External Counterpulsation (EECP) treatment is a noninvasive, outpatient procedure to relieve angina by improving perfusion in areas of the heart deprived of adequate blood supply.

The Cardiac Center now performs Intravascular Ultrasound (IVUS), an invasive procedure conducted in the Cath Lab that produces ultrasound images from inside the coronary artery. This procedure allows physicians to look inside the coronary artery to evaluate stent deployment and identify possible lesions and plaque.

Another new testing procedure conducted at The Cardiac Center is the T-Wave Alternans test, a noninvasive diagnostic test designed to help identify patients at risk of life threatening heart rhythm disturbances that can lead to sudden cardiac death. The test is conducted much like a standard stress test and allows close examination of the beat-to-beat variations in a patient’s EKG.

Cardiology has been tailoring current equipment and systems in preparation of achieving a comprehensive database of clinical information derived from all diagnostic equipment and clinical areas within the Cardiac Center. This integrated system will put patient data at our physicians’ fingertips and provide a database to support clinical research activities. In the past year, the APOLO data warehouse integrated digital imaging from the Noninvasive Laboratory, and digital Holter scanners and recorders from Cardiac Monitoring. The next steps will integrate data from the Electrophysiology and Catheterization Lab.
Clinical Research. The Cardiac Center initiated twenty-one new clinical trials during the past year alone, including phase III and phase IV pharmaceutical and device trials. Those topics include anemia, heart failure, acute coronary syndrome, hypertension, coronary bypass, dyslipidemia, C-reactive protein, acute myocardial infarction intervention and post-intervention studies.

Investigators at The Cardiac Center have also initiated several projects examining the relationship between lipoproteins, oxidative stress, platelet reactivity, endothelial function, and smoking status in African-Americans and Asian-Indians. Studies have demonstrated that endothelial dysfunction may independently predict long-term progression of atherosclerosis and risk of cardiovascular events, and that amplified platelet reactivity increases the risk of thrombus formation. Cigarette smoking has been shown to cause alterations of lipid profiles and increase free radical activity (measured by isoprostane 8-epi-PGF2a), both of which adversely affect endothelial function and platelet reactivity. Our investigators hypothesize that after an intensive smoking cessation program, there is an improvement in the lipoprotein particle profile, restored endothelial function, normalized platelet reactivity, and reduced excretion of 8-epi-PGF2a.

Cardiology continues to support investigator-initiated research by developing strategic and collaborative relationships with academia, industry, and the community. This effective research infrastructure includes assistance with manuscripts, funding applications, laboratory support, and data collection. By promoting education and dissemination of activities and results intramurally and extramurally to physicians and the public, we are developing an innovative clinical research network as a means to increase funding opportunities, publications, and ultimately aim to improve patient care.

Funded Programs in Minority Cardiovascular Risk Prevention. The areas surrounding the Creighton University Medical Center have historically lacked a constant, organized, and durable program to identify and educate individuals at high risk for cardiovascular disease as well as the importance and significance of disease prevention. The Cardiac Center has recognized this need to provide educational and preventative programs to the local community, and has responded with multiple initiatives. These programs have enhanced the University’s visibility in the Omaha community as a partner willing to share its resources for improving health care in the minority community.

◊ The Creighton Heart Education Center (CHEC), in partnership with the National Heart Lung and Blood Institute, created the Enhanced Dissemination and Utilization Center (EDUC) to improve cardiovascular health at the community level, especially in communities at high risk for cardiovascular disease (CVD). CHEC uses a community-oriented approach based on an alliance between CUMC, community centers, and places of worship to implement CVD risk factor education, prevention, intervention, and reduction in the African-American population. Many of the community projects are conducted from the 30-foot mobile education and teaching unit (MESU). This project, one of six in the country, is funded under contract with the National Heart, Lung, and Blood Institute (NHLBI), and equally supported with funding from the Creighton University School of Medicine.

◊ The Cardiovascular Risk Factor Screening and Intervention in African-American Adults (CARSI) program provides cost-efficient, straightforward education and support to a large segment of Omaha’s African-American population. The project focuses on cardiovascular disease prevention through healthy eating, physical activity, and strong culturally-sensitive
partnerships with health care providers and agencies. A network of community-based educators guide and support participants through the program.

**Funded Programs in Smoking Cessation and Cardiovascular Risk Reduction.** The Cardiac Center has developed an intensive, multi-component smoking cessation/relapse prevention intervention, the effectiveness of which is being compared to traditional smoking cessation programs. This study provides a medical service that was not previously provided within the community and the surrounding area, and treating tobacco dependence offers clinicians a great opportunity to reduce the loss of life and unhappiness caused by this chronic condition.

◊ The Peer 2 Peer program leverages the success of the lay health educator model to offer support group services as a supplement to clinic-based smoking cessation services. Ex-smokers are offered the opportunity to serve their community as smoking cessation support group leaders and are trained and paid stipends by the Cardiac Center for their dedicated services.

◊ The Priority Women project, funded by the American Legacy Foundation, provides smoking cessation support to low socioeconomic status women from shelters and other transitional living facilities that require a smoke-free environment.

**Osteoporosis**

Investigators in the Creighton Osteoporosis Research Center (ORC) have, for the past forty-five years, made Creighton an international center of excellence in human bone research — investigating how the skeleton remodels itself to repair damage, what goes wrong with that process in the development of osteoporosis, and what the nutritional and exercise requirements are for building strong bones and maintaining bone health. In recent years, the ORC researchers have also focused particular effort on vitamin D metabolism and on the inheritance of bone mass.

ORC investigators identified several kindreds in which high bone mass is inherited as a Mendelian dominant trait. In one of these kindreds, and in collaboration with biotech and pharmaceutical industry partners, they have identified the gene (Lrp5) and causal mutation (G171V) responsible for the high bone mass phenotype. This finding continues to generate tremendous excitement within the bone field because it has revealed a previously unknown pathway important for regulating bone mass and it provides a new target for developing pharmaceutical agents to treat osteoporosis. It also has the potential to open the window on very basic cell biology questions, such as the chemical representation of the set point involved in all biological feedback control loops.

One of their best-known projects, the “Omaha Nuns Study,” involves nearly 200 nuns from Midwestern religious communities who have been followed with intensive physiological measurements for the past thirty-eight years. Results from this study have literally “written the book” on the metabolism of calcium in the middle-aged woman. Findings from these studies provided, for example, the principal scientific basis for the NIH recommendations for adult calcium intake. The database developed from these studies since their beginning in 1967 is continuously being mined, resulting in one to three original papers each year evaluating, for example, the relationship between calcium intake and obesity, the importance of phosphorus intake, and the role of vegetables in maintaining total body health.
In a more recent study, ORC investigators found that low doses of estrogen are effective in preventing postmenopausal bone loss, but only if combined with high intakes of calcium and supplemental vitamin D. This is good news for women who are unable to tolerate the side effects of estrogen replacement therapy at conventional doses, as well as for women, who because of the concern raised by the estrogen arms of the large Women’s Health Initiative trial, are reluctant to use estrogen.

Recently ORC researchers have broadened the scope of their studies to include children. Four studies of bone health in pubertal girls are currently under way. Findings from one of these studies demonstrated that a high intake of dairy foods does not lead to excessive weight gain. Many girls start avoiding dairy foods because of concern about becoming overweight. The ORC study helps to dispel the myth that dairy foods lead to overweight.

The Creighton ORC is one of five sites in the United States participating in an NIH-funded study to establish a normative database for bone mass in children. Such a database is sorely needed so clinicians can better assess the bone health of children with diseases that directly or indirectly affect their skeletons. More than 1,500 children and adolescents are enrolled in this three-year study.

ORC investigators are also involved in work to decrease the incidence of stress fractures in military recruits. A study of 4,139 female Army recruits revealed that young women who have low bone mass and are sedentary and smoke cigarettes prior to starting basic military training have a high risk of suffering a stress fracture. Future studies are planned to target such recruits for a modified training program so that their risk of fracture is reduced. A study is now under way at the Great Lakes Naval Center, Illinois to determine whether calcium and vitamin D supplementation decrease the incidence of stress fracture in Naval recruits.

Recent ORC work has focused on the human vitamin D requirement and has shown that normal adults use far more of this key substance every day than had been previously thought. Typically, we get 80 to 90 percent of our daily need from the sun. But persons of color (and the housebound) do not make much vitamin D that way and are much more dependent on vitamin D supplements and fortified foods. The ORC is currently exploring the daily vitamin D need for persons of color, under a contract from the U.S. Department of Defense, which is concerned to ensure normal vitamin D status in persons of color stationed at northern latitudes.

Creighton ORC investigators have provided the conceptual leadership, the detailed background mapping of the field, and the technical excellence needed to support a significant portion of the national research effort into the problem of osteoporosis. Creighton’s expertise in the use of radioactive calcium led to the center’s being asked to do all of the calcium absorption studies for a national multicenter study involving over 8,000 aging women from around the country. Creighton has literally become the “bioavailability capital” of the world. The ORC histomorphometry laboratory is the only one of its kind in the country to meet standards termed Good Laboratory Practices, and it too serves as a center for processing and interpreting bone biopsies from many of the national osteoporosis trials.

Recognition of the ORC’s work is evidenced by:

◊ Creighton was sought by Procter & Gamble, Abbott Laboratories, the New Zealand Dairy Board, Kellogg’s, General Mills, Mead-Johnson, to name a few, as the sole site to test the
bioavailability of calcium enrichment added to their foods or beverages. The ORC was a study site for the trial of one of the first effective treatments for osteoporosis, Fosamax. ORC researchers worked with Eli Lilly & Company to establish the mechanism of action on bone of their Selective Estrogen Receptor Modulator, Evista. The ORC continues to participate in clinical trials of new medications for the prevention and treatment of osteoporosis.

◊ The director of the ORC has served on the Advisory Council for the National Institute of Arthritis, Musculoskeletal, and Skin Disorders, and is past-president of the American Society for Bone and Mineral Research, the world’s largest body of scientists in the bone field.

◊ ORC investigators have chaired many National Institutes of Health and U.S. Department of Defense grant review committees and served on countless others. They serve (or served) on the Board of Directors and the Scientific Advisory and Nurses’ Steering Committees of the National Osteoporosis Foundation, as well as the Panel on Calcium and Related Nutrients of the Food and Nutrition Board (Institute of Medicine), the body that set the most recent calcium requirements. They also serve as advisors to NASA and consult on experiments to determine the effect of space travel on bone health. They also serve on numerous editorial boards for all the major bone journals.

◊ ORC investigators wrote the chapter on bone health for the Encyclopedia Britannica, two books on calcium and osteoporosis for non-professional audiences, and the monograph for the Food and Drug Administration which led to approval of a health claim for calcium-rich foods. ORC researchers have contributed to the recently released Surgeon General’s Report on Osteoporosis and have published a multitude of journal articles and book chapters in a wide variety of disciplines — medicine, nursing, exercise science, nutrition, biomechanics, genetics, molecular biology, bone biology, and others.

◊ Members of the ORC have been selected as Fellows in the American Society of Clinical Endocrinology, the American Institute of Nutrition, and in the American Academy of Nursing. In 1994 and 2003, two members of the group received the Barter Award of the American Society for Bone and Mineral Research (the top national prize for clinical research into bone). Creighton is the only university in the world to have two of its faculty members honored with this award. The director of the center was recently named “Master” in the American College of Physicians. One of its members is a Fellow of the American Academy of Nursing. Another, in a single year, received the prize of the Institut Candia (France), the McCollum Award of the American Society for Clinical Nutrition, and the E. V. McCollum International Lectureship of the American Society for Nutritional Sciences.

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**NURSING**

The School of Nursing faculty participate in varied research studies using both qualitative and quantitative methods. Two projects are focused on grounded theory development in areas that
currently have no theoretical frameworks. One research team is exploring the process of partnering during home visits with high risk, pregnant adolescents to improve their parenting and health outcomes. Describing the elements of effective partnering will be used to improve the communication skills of students and health professionals who work with vulnerable clients. Another team is interviewing parents from hereditary cancer families with their adolescent and young adult children to develop a theoretical framework of the process of adapting to intergenerational vulnerability. Family experiences, perceptions, communications about risk, and decisions about testing and choosing health promoting strategies are being explored to better inform the education, counseling, and social support of these families.

Several faculty members are at work on quantitative research projects which survey pediatric clinic compliance with federally-mandated lead screening of children, continue a longitudinal study of outcomes of premature infants, pursue health policy analyses and issues of end-of-life decision-making. Researchers with interests in aging and health care studied the effects of the Eden Alternative, a focus on improving the nursing home environment and subsequently, the residents’ quality of life; developed an evidence-based protocol for prescribing medications for older adults; and used case studies to describe the effects of relocation on elderly nursing home residents. Two nurse researchers are pursuing a program of research on the effects of a high calcium diet and exercise on maximizing bone health in young girls. Other faculty members are pursuing doctoral dissertations on symptom management in post-cardiac surgery patients and on the bereavement experiences of African-American women following the death of their infants.

The scholarship of teaching is also of interest in the school because of the recent addition of Meti Man, a computerized, simulated patient that can be programmed to demonstrate symptoms of various conditions. Several faculty members are taking advantage of this relatively new acquisition to program and test the effects of varied simulated conditions on student learning and self-efficacy.

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**PHARMACY AND HEALTH PROFESSIONS**

The School of Pharmacy and Health Professions is composed of faculty who guide the development of excellence in the clinical professions of occupational therapy, pharmacy, and physical therapy. The school also offers courses of study that lead to a certificate in Health Services Administration and grants the degree in Emergency Medical Services. The School consists of four academic departments: Occupational Therapy, Pharmacy Practice, Pharmacy Sciences and Physical Therapy. These departments work collaboratively and collectively to achieve excellence in these professional program offerings. The scope of research is broad — with active research programs and projects in the biomedical sciences, health services research, clinical research, and educational research emphases. Interdisciplinary and interprofessional approaches characterize our research models and culture throughout the scope of research subjects. The faculty is composed of both basic scientists and clinician scientists who provide a framework for basic, translational, and applied research opportunities. Faculty engage in national, regional, state-wide, and local research initiatives – with several holding appointments on federal grant review panels and providing consultation and service.
for agencies such as the National Institutes of Health (NIH), Health Resources Services Administration (HRSA), Agency for Healthcare Research and Quality (AHRQ), and National Science Foundation (NSF). A revitalization, growth, and development effort to support and enhance faculty research has been initiated with the new Dean’s appointment in mid-June of 2003. A newly formed Office of Research was established in mid-2004 to provide faculty support and services to assist faculty with quality and productivity in research efforts.

**Research Funding**

In the June 2003 through June 2004 period, eighteen research awards were attained by our faculty through research grants and contracts. The total award amount for this period was $520,534. Funding has been received in the broad research categories of biomedical sciences, health services research, clinical research, and educational research. An eight-month interruption to renovate and modernize basic laboratory facilities occurred during this time period, causing a temporary break in continuity for our basic science researchers within the school. A decrease in the submission rates for external funding directly related to this scientific community of faculty is observed. However, this renovation was a necessary part of the essential improvements required to facilitate the basic science initiatives. These scientists are focusing on the enhancement of excellence in collaborative research. The quality of the facilities has a direct impact on their success. Future plans include increasing the availability of more facilities, essential to our planned future growth.

**SPHP Faculty Research Grant Development Program**

The School received a pivotal, capacity building award from the Health Futures Foundation to establish an internal seed money grant program entitled the SPHP Faculty Research Grant Development Program. The purpose of this program is to facilitate faculty research efforts for high impact, high value, and potentially externally fundable works. The SPHP Faculty Research Grant Development Program will launch in the June 2004 through June 2005 period. This program is conceptualized as a quality building effort using the peer and administrative review process to enhance faculty competitiveness and productivity in research.

**Creighton University Health Services Research Program (CHRP)**

The School received a second pivotal, three-year capacity building award from the Health Futures Foundation to establish the Creighton University Health Services Research Program (CHRP at http://spahp.creighton.edu/chrp). CHRP is an interdisciplinary faculty core with representatives from all departments within SPHP and other campus schools. CHRP facilitates researchers and scholars to come together for interprofessional collaboration and faculty development. The intent of the program is to develop a community of ambitious and dedicated faculty with compatible health services research interests and complimentary research skills by providing both structural and cultural support for their efforts. Several specific areas of study are health care safety, health care quality, effectiveness of health care, organizations and health, access to care, economics of care, health care disparities, health care literacy, cultural health, health care promotion, disease prevention, and the science of translating research to practice. Developing community relationships that build capacity to answer questions that test application of research findings to generalized practice is central to CHRP’s mission. CHRP is founded on collaborative research relationships established with the Nebraska State Department of Health and Human Services in the Medicaid Program, the Office on Aging, and
faculty members and practitioners throughout the health care community. The third year of an AHRQ federal grant to study technologies and patient safety, entitled, *Impact of Handheld Technologies on Medication Safety in Primary Care – R18HS11808-1, Agency for Healthcare Quality and Research*, provided bridge funding for the CHRP launch.

**Office of Interprofessional Scholarship, Service and Education (OISSE)**

The Office of Interprofessional Scholarship, Service and Education was formed in 2001 as a resource to facilitate development of academic-community partnerships supporting domestic and international service learning experiences and interprofessional student training opportunities. Current outreach activities include the Omaha and Winnebago Tribes of Nebraska and participation with the Institute for Latin American Concern in the Dominican Republic. All experiences combine cultural immersion and health service provision to meet the profound health disparities experienced by these underserved communities. The Office of Interprofessional Scholarship, Service and Education also provides e-learning opportunities on the Office website (http://oisse.creighton.edu) including on-line learning modules in cultural competency and health related issues experienced by the populations served. The ten-year community-campus partnership with the Native American tribes has resulted in receipt of three federal grants, with current funding allocated through *Dreamcatchers and the Common Good: Allied Health Leadership in Generational Health and Ethics* HRSA Grant # 1 D37HP00824-01 (1 July 2001-30 June 2005). In 2003-2004, students from pharmacy, occupational therapy, and physical therapy have participated in the Native American outreach programs, providing over 8,900 hours of service. Clinical contracts between the University and the tribes have enabled sustained provision of reservation-based physical and occupational therapy services benefiting over 1,000 patients. In addition to a research focus on service learning and interprofessional student training, the innovative work and model of the office structure also promotes student and faculty scholarship related to rural health issues, cross-cultural and community-based practice, health care access, and social justice concerns.

**Student Research**

*Graduate Student Research*. The School of Pharmacy and Health Professions has both undergraduate and graduate students actively engaged and mentored by faculty in research. At present, ten students are enrolled in the Masters of Science Program in Pharmaceutical Sciences. A research thesis is required for the fulfillment of the requirements of the program. The research areas include pharmaceutics, immunology, pharmacology, toxicology and pharmacokinetics. The specific areas of interest include drug delivery systems, regulation of T helper cells, pharmacology of the eye, and TCDD toxicity. To date, eight students have graduated from the program. PhD candidates in a joint program with the School of Medicine participated in faculty mentored projects during this past year.

*Clinical Doctorate Student Research*. Research project completion is a required activity within the Doctor of Occupational Therapy and Doctor of Physical Therapy programs, and encouraged in the Doctor of Pharmacy Program. The faculty provide mentorship and guidance in skills development for all forms of research, with common areas of emphasis being service-learning, reflective practice, and applied outcomes research.
Department of Occupational Therapy

The **Department of Occupational Therapy** is home to eleven faculty. The large majority maintain clinical training sites and services. The OT Department recently graduated the first in the U.S. entry-level class with the professional doctorate, the doctor of occupational therapy (OTD). Faculty members are engaged in the following areas of research: increasing services in rural areas, occupational patterns and disability, scholarship of teaching and learning, interprofessional geriatric care, health disparities, migrant workers, patient safety, and interprofessional care of the Native Americans through participation in OISSE grants and contracts. The clinical services, including the CUMC contract services, satellite clinics in Omaha and Bellevue, OT residency program at CUMC, clinical services at Macy and Winnebago Reservations, provide the practice laboratory for most research activities of the department faculty. In 2004 the first Doctor of Occupational Therapy residency position in conjunction with CUMC was established. Such residency training is of vital importance to the advancement of excellence in research and scholarship of a profession. From June 2003 to June 2004, the faculty produced thirty-three publications, provided six international, twenty-five national, thirteen regional or state presentations, and received four national recognitions.

Department of Pharmacy Practice

The **Department of Pharmacy Practice** is primarily responsible for the clinical education of students enrolled in the Doctor of Pharmacy program. The large majority of the forty-three faculty are clinician scientists whose research efforts are integrated within their clinical practice community. Scholarship emphases are in educational assessment and outcomes research, clinical outcomes research, pharmacogenomics, nanomedicine for blood-brain barrier penetration, infectious diseases, clinical research in chronic disease management of areas such as diabetes, dyslipidemia, pain management, and public health research related to immunizations and disease prevention. Faculty maintain practices at CUMC, hospitals in the Alegent system, Children’s Hospital, Methodist Hospital, Omaha and Lincoln VAMCs, and Bryan LGH in Lincoln. In addition, we have a joint relationship with Walgreen’s in Omaha for clinical model development in the community. Our clinical faculty has established collaborative relationships with faculty in the Department of Medicine for a number of general and specialty clinics, the Department of Family Practice, and the Departments of Neurology, Psychiatry, and Anesthesiology. The Drug Informatics Center located in the Health Sciences Library is a key service and research partner with CHRP in the Office on Aging collaboration. The department has established and maintained three residency positions in pharmacy practice who complete their training throughout the CUMC and community partner health systems and organizations. One fellow in the area of cardiology and three residents in the areas of drug informatics and clinical pharmaceutical care complete training within the department. From June 2003 to June 2004, the faculty produced thirty-two publications, provided thirty national, regional or state presentations, and received three national recognitions.

Department of Pharmacy Sciences

The **Department of Pharmacy Sciences** has responsibility for the basic pharmaceutical science and behavioral science courses in the curriculum. Of the twenty-one faculty who make up the department, a preponderance are PhD-trained pharmacy scientists who have backgrounds in pharmaceutics, pharmacology, medicinal chemistry, health services research, and social and behavioral pharmacy. Discipline areas include pharmaceutics, pharmacokinetics, dosage form
development, medicinal chemistry, pharmacological mechanisms of drug action, pharmaco-economics, organizational theory, health services research, sociobehavioral research, and health outcomes. The department is home to the MS in Pharmaceutical Sciences. From June 2003 to June 2004, the faculty produced a solid record of publications, provided one international, fifty-four national, and thirty-seven regional or state presentations, and filed one patent.

Department of Physical Therapy

The Physical Therapy Department is composed of fourteen faculty. Eight faculty have Teaching-Research classification appointments, four of the faculty have Clinician-Educator classification appointments, and one has a 0.5 FTE adjunct appointment. One of the Teaching-Research faculty has significant administrative responsibilities in the School. Faculty members are engaged in a broad range of research areas. Major areas include: biodynamics and mechanics, Parkinson’s disease, interprofessional care of the Native Americans through participation in OISSE grants and contracts, patient safety, and prion disease. Physical therapy clinical services are provided at CUMC through a management contract. These services include in-hospital, two offsite clinics, an ambulatory faculty clinic, and an athletic medicine clinic for Creighton University student athletes. The department has established a Physical Therapy residency in orthopedic physical therapy in conjunction with CUMC and initiated this program with the first resident June 1, 2003. The department provides other services through clinical contracts at the Winnebago and Macy Indian Reservations. External grant funding through participation in OISSE grants and contracts provides support for student training in these communities. Faculty in the department have ascertained extramural funding to support the prion disease research. The faculty produced seventeen peer-reviewed publications, provided thirty-three national, regional and state presentations, and received three national recognitions.

Physics

Research in the Department of Physics covers a spectrum from the theoretical discussion of the physical meaning of quantum mechanics to experiments in high energy nuclear physics. The high energy project involves several faculty in collaboration with Brookhaven National Laboratory in New York, Lawrence Berkeley Laboratory in California, and the European Center for Particle Physics Research in Switzerland. It investigates the theoretical production of particles from intense fields and the experimental study of nuclei at very high temperatures and pressure. It is hypothesized that, by recreating the conditions present a fraction of a second after the Big Bang, a state of matter not present in the universe since that time, a quark-gluon plasma, might be recreated as well. Observing this previously unseen state will provide information that is relevant to not only particle physics but also cosmology. The quark-gluon plasma is studied using boson interferometry and measurements of strangeness production, work that requires the development of large scale real time control and monitoring systems.

Another line of research seeks to determine the details of the x-ray production from atomic inner-shell ionization using a particle accelerator to produce low energy positive ions for bombarding atoms
in solids. Very soft, low energy x-rays are measured with a Si(Li) detector equipped with an ultra-thin entrance window. Collateral information about the general interaction of ions moving in solids is also derived from these studies. The research has importance for basic studies of atomic interactions and has wide application to the nondestructive quantitative analysis of materials by measuring proton-induced x-ray emissions (PIXE) and to modifications of materials for use in the semiconductor industry. Inner-shell ionization in atoms is also being investigated through the photo-ionization process using a radioactive source of x-rays.

Research is currently being developed in the area of liquid-to-glass and liquid-to-gel transitions, one of the major unresolved problems in condensed matter physics. In this research, dynamic light scattering will be used to measure structural relaxation of liquids, gels, and epoxies on approach to the transition point. Another developing area of research is the rapidly growing field of “Solid State Ionics.” It will involve experimental and theoretical components aimed at tracing elementary steps of ion motion and understanding how the structural environment affects the dynamics of the mobile ions. The chief experimental technique is dielectric (or conductivity) spectroscopy which measures the dielectric response of mobile ions to an applied electric field.

The Department of Physics also has an active research program in the field of Biophysics. Research in the biophysical optics lab is currently focused on the development and application of innovative optical techniques to study cellular and tissue environments. So far, we have developed a fully configurable three-channel, laser-scanning confocal microscope that works in both reflectance and fluorescence modes. In addition, we have built an all-solid-state Titanium:Sapphire laser that produces 1 W tunable output in the infrared from 730-900 nm. These two instruments are currently being used together to study the wavelength dependence of cellular response to intense (currently up to $10^{11}$ W/cm$^2$, CW) near-infrared radiation, and we anticipate multiphoton microscopy in the near future. Finally, in collaboration with the Department of Biomedical Sciences, we have recently built an optical stretcher facility for biomechanical studies of outer hair cells, osteocytes, and cancer cells.

Several topics in the field of astro-particle physics are also under investigation in the department. One of the greatest mysteries of our time is dark matter; evidence shows that the Universe is dominated by a form of matter which does not interact electromagnetically and which is not composed of the familiar protons, neutrons, and electrons. Using theoretical models which propose particle physics candidates for the dark matter, detection rates in current and future detectors are calculated through extensive computer simulations. Such calculations can shed light on the distribution of dark matter and rule out classes of theories which are not yet testable directly at accelerators. In addition to the research on dark matter, the composition of extremely energetic cosmic rays is also being studied to determine realistic backgrounds at neutrino telescopes which are opening new windows on the Universe. In particular, the energy and angular dependence of prompt muons, those created in the decay of charmed particles, is being simulated numerically.
Creighton Psychiatry is an essentially new department arising from the 1999 reconfiguration of academic psychiatry in Omaha. The department continues to rapidly expand research activities within and beyond the faculty. Perhaps most significant is the mentoring of junior faculty as well as active engagement in collaborative projects with local, regional, national, and international colleagues.

Remarkable progress is directly measurable, notably that funded research has risen from zero in early 2001 to some $8 million as of late 2004. The number of active faculty researchers has risen from zero (before Dr. Wilson arrived as Chairman in 2000) to more than a dozen and continues to increase, most notably with Dr. Patricia Sullivan having joined the faculty as a senior behavioral science researcher with more than twenty years of continuous federal funding for studies involving psychological trauma.

Departmental activities are primarily via the Department Institute for Clinical Neuroscience and Psychopharmacology founded by Dr. Wilson and now under the directorship of Fred Petty, MD, PhD. Principal sites include CUMC, Alegent, and the VA Hospital. Dr. Petty, an internationally respected and highly productive basic and clinical neuroscientist, is Vice-Chair for Research in Psychiatry and Professor of Psychiatry at Creighton, as well as Director of Mental Health Research for the Nebraska-Western Iowa VA. Dr. Petty continues his VA Merit Award and is leading a major collaboration to situate a Mental Illness Research, Education and Clinical Center (MIRECC) within the Midwest VA system. Collaborative international research programs are also being developed with the Hilo (Hawaii) Health System, as well as the University of Cairo and Behman Hospital in Egypt.

Dr. Wilson’s schizophrenia relapse prevention and his disparities in psychiatric diagnosis proposals both scored in the top 6 percent for NIMH awards. Other proposals pending federal funding include Dr. Happe’s work in autonomic nervous system development (VA and NIH), Dr. Sokol’s PANDAS pilot study (NIMH), and Dr. Fernandes’ mood-brain imaging correlation study now in the pilot phase (VA).

Drs. Wilson and Petty serve on the national research committees for NIH-SAMSHA and the VA, respectively, as well as the scientific CNS advisory boards for numerous pharmaceutical houses. Thus, industry-sponsored psychopharmacology research continues to grow dramatically as Drs. Wilson, Petty, and Sattar participate in diverse multicenter studies that have begun to involve more junior Creighton faculty as well. So, too, as a Robert Wood Johnson Scholar, Dr. Sattar is working on a multi-year project to advance clinical research in the area of substance abuse.

Collaborative research remains robust. Within Creighton, the department has established links with Biomedical Sciences, Pharmacology, Cardiology, Medicine, as well as the Center for Health Policy and Ethics, School of Nursing, School of Pharmacy and Health Professions, and the School of Law. Beyond Creighton, substantive links have been made with UNMC, University of Nebraska Psychology, Nebraska Health and Human Services, Children’s Hospital, Douglas County Health Center, Catholic Charities, and Boys and Girls Town.
The department has also helped spearhead a University-wide initiative to promote the considerable medicolegal expertise at Creighton, including our own active studies in forensic psychiatry and health policy. Creighton Psychiatry is the major sponsor of the Omaha Center for Psychotherapy and Psychoanalysis which, under the leadership of Dr. Svolos, has emerged as an internationally esteemed model of inter-disciplinary training and research.

Senior faculty are also closely involved in ongoing mental health reform in Nebraska. As this relates to research in particular, we are supportive of emerging plans for a Center of Excellence to include clinical and basic science research facilities for studies in Omaha, as well as state-of-the-art telehealth linkages to promote clinical and research outreach across the state. This network will include both clinical trials, as well as services and outcomes research.

Overall, faculty authorships of refereed publications have risen from a single paper in 2000 to in excess of 150 this year. Moreover, these span all phases of the life cycle as well as most major domains of clinical interest in addition to health policy, forensics, psychoanalysis, anthropological medicine, and neurobiology among many other diverse subjects. The Psychiatry faculty is grateful for an environment at Creighton that has been so conducive to these opportunities for us to contribute research that helps better understand and treat diverse mental illnesses.

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**Sociology and Anthropology**

- **Mr. James T. Ault, III** is continuing research on the three-year study of the use and reliability of SIR II forms in the College of Arts and Sciences. He has developed a data base that includes all SIR II forms processed by the Division of Information Technology (DOIT) for six consecutive semesters. He has merged these data with data describing the attributes of the courses and of the faculty members who taught them. The course attributes include curricular variables, including whether the course is required or elective, size, level, and distribution of grades awarded in the course. Faculty data include ethnicity, gender, tenure track/non-tenure track, tenure status when the course was taught, years at Creighton, rank, and others.

- **Fr. Raymond Bucko, SJ** is currently researching topics in the history of anthropology: action anthropology; Jean Francois Lafita, SJ; Eugene Buechel, SJ; and the history of research on the ghost dance. He also is researching the ethnographic collection assembled by Fr. Buechel, SJ of Lakota material culture. He is editing and amplifying an interpretive display of Lakota bows and arrows as well as researching Lakota war charms and Lakota parfletch designs. He continues to research the history of liturgical adaptations made during the annual Tekakwitha Conference and anthropological and theological issues of inculturation in Catholic ritual practice.

- **Dr. Jerry Clark** continues to research a major work on the Genoa Indian School of Genoa, Nebraska, a federal boarding school operated from 1884 to 1934. He is working with a massive amount of documentation from the National Archives in Washington, D.C.
Dr. Barbara Dilly is engaged in ongoing action research in a small rural community in Northeast Iowa to help its citizens define and implement appropriate economic development agendas. She is working on an evaluation of the processes by which local citizens negotiate conflicts associated with river recreation and environmental tourism development. Her work in this agricultural region also includes long-term ethnographic research on the Old Order Amish farmers and other conservative religious groups in Northeast Iowa to understand how they adapt to the changing agricultural economy. She is also researching the social and cultural history of the American family farmer’s daughter to understand how an American icon was shaped by popular culture’s views of women and agriculture.


Dr. Lisa Riley continues to design and provide research for The Center for Marriage and Family (CMF). She is evaluating the Nebraska Healthy Marriage Initiative, part of President Bush’s Healthy Marriage Initiative which includes two components. The first, a baseline community survey, determined the knowledge about the benefits of a healthy and stable marriage of those in the designated community. A second component is the evaluation of a three-program ongoing marriage education process. Additionally, she is doing research on a new national study focusing on the issue of marital stability and religion. She also continued her research on disagreement among newly married couples as well as religiosity differences among spouses.

Dr. Sue Schuessler continues her research on how knowledge is generated, transmitted, and applied by African healers. She is also researching the role of trance in developing a healthy and expanded sense of self. She continues to research the healers’ response to the political situation that underlies the increase in infectious disease and how the healers are dealing with the social problems resulting from the increase in disease. She is also doing research on religion and healing in the United States.

Please visit the webpage for the Department of Sociology and Anthropology at:
http://puffin.creighton.edu/soc/soc.htm


Aizenberg, S. (2004, November). Things that cannot be compared (Dissonance 1) [Poem]. *Blackbird*.


Kelly, T. M. (2004, April). [Review for publication, Church and state in Utah: Local newspaper coverage of the LDS (Mormon) Church and political actors over a First Amendment controversy]. Religion & Media Interest Group, AEJMC.


Spencer, B. (2003). Save or turn to stone [Short story]. In S. Clark & M. Saiser (Eds.), Road trip: Conversations with writers. Backwaters Press.


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**BUSINESS ADMINISTRATION**


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**DENTISTRY**


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LAW

CULHANE, MARIANNE, Bankruptcy Cases on the Supreme Court’s Term: Part I, 22 AMERICAN BANKRUPTCY INSTITUTE JOURNAL 6 (September 2003).
CULHANE, MARIANNE, Bankruptcy Cases on the Supreme Court’s Term: Part II, 22 AMERICAN BANKRUPTCY INSTITUTE JOURNAL (October 2003).


CULHANE, MARIANNE, Conyers’ Bill Takes Aim at Insider Benefits, 22 AMERICAN BANKRUPTCY INSTITUTE JOURNAL 6 (July/August 2003).

CULHANE, MARIANNE, Enforcing (or Not) Arbitration Clauses in Bankruptcy, in 2 CONSUMER FINANCIAL SERVICES LITIGATION (Practising Law Institute 2003) (with White, Michaela).


CULHANE, MARIANNE, Retirement Benefits and Bankruptcy: Recent Developments, 22 AMERICAN BANKRUPTCY INSTITUTE JOURNAL (November 2003).


MANGRUM, RICHARD COLLIN, *MANGRUM ON NEBRASKA EVIDENCE* (West 2004).


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**MEDICINE**


**NURSING**


Furlong, B. (2004). Health care for some, but borne on the backs of the poor. In M. deChesnay (Ed.), *Caring for the vulnerable* (pp. 431-440). Sudbury, MA: Jones & Bartlett Publisher.


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**Pharmacy and Health Professions**


Grants

Arts and Sciences

Bergman, R. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Bucko, R. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Burke-Sullivan, E. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Cherney, I. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Cook, T. [Principal Investigator]; Dickel, T., & Ishii-Jordan, S. [Co-Investigators]. Distance education component to the Magis program. Our Sunday Visitor Institute — $35,000 — (1 August 2003).


Crawford, S. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Danielson, M. A. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Dickel, T. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Duda, G. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Gardiner, D. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Greenspoon, L. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Olson, L. [Principal Investigator]. Professional development project to provide a summer reading program for at-risk elementary students in socioeconomically and linguistically diverse schools - year three. Nebraska Department of Education — $40,164 — (1 March 2004-28 February 2005).

Ponec, D. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Simkins, R. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).

Smith, J. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Super, R. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


BUSINESS ADMINISTRATION

Graves, R. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).


Taylor, M. Scholarship of teaching and learning small grant award. Office of Academic Affairs, Creighton University — $2,500 — (June 2004).
DENTISTRY


Latta, M. [Principal Investigator]. Student dental research support. Iowa Dental Association — $500 — (15 January 2004).

Latta, M. [Principal Investigator]; & Barkmeier, W. [Co-Investigator]. Laboratory evaluation of the degree of conversion of prime and bond nt adhesive using a spectrum 800 halogen light compared the mini-LED curing light. Dentsply — $1,000 — (15 August 2003).


Law


Mahern, C. [Principal Investigator]. One hour of sharing campaign. Nebraska State Bar Association — $1,000 — (1 July 2003-30 June 2004).


Agrawal, D. [Principal Investigator]. Further characterization and isolation of binding site(s) of (s)-albuterol in human airway smooth muscle cells. Sepracor, Inc. — $49,856 — (5 January 2004).

Agrawal, D. [Principal Investigator]. Flt3-ligand immunomodulation and therapy in asthma. NIH — $267,042 — (15 March 2004-28 February 2005).


Anderson, R. [Principal Investigator]. Multicenter double-blind randomized study to evaluate the safety and efficacy of lamotrigine 200 mg/day, 300 mg/day and 400 mg/day compared with placebo in subjects with painful diabetic neuropathy. GlaxoSmithKline Company — $6,192 — (1 November 2003).
Anderson, R. [Principal Investigator]. Phase 3 randomized double-blind active controlled multicenter trial to evaluate the safety and efficacy of BMS-298585 in combination with metformin compared to pioglitazone in combination with metformin in subjects with type 2 diabetes who have inadequate. Bristol-Myers Squibb — $8,628 — (7 November 2003).


Bashir, R. [Principal Investigator]; Bertoni, J., Prendes, J., & Omojoa, M. [Co-Investigators]. Multicenter randomized blinded parallel-group study of avonex compared with avonex in combination with oral methotrexate intravenous methylprednisolone or both in subjects with relapsing-remitting multiple sclerosis who have breakthrough disease on .... Biogen — $17,920 — (1 July 2003).


Casale, T. [Principal Investigator]. Allergen immunology co-administered with anti-IgE mAb (E25). Immune Tolerance Network/NIAID/NIH


Casale, T. [Principal Investigator]. The effects of omalizumab (Xolair®) on airway hyperresponsiveness. Novartis Pharma/Genentech Inc. — $209,404.

Casale, T. [Sub-Investigator]. FLT-3 ligand, immunomodulation and therapy in asthma. NIH.

Casale, T. [Principal Investigator]. A four-week, double-blind, placebo-controlled exploratory evaluation of FEV_{1.0} changes and safety of ONO-6126 in patients with chronic obstructive pulmonary disease (COPD). ONO Pharmaceuticals.


Casale, T. [Principal Investigator]. A placebo-controlled, multiple-dose, sequential dose-escalating study to evaluate the safety and clinical activity of IDEC-152 (Anti-CD23) monoclonal antibody in patients with mild persistent to severe persistent allergic asthma. IDEC.


Cavalieri, S. J. [Principal Investigator]. Omega project. University of Iowa.— $8,500 — (22 March 2004).


Chatterjee, A. [Principal Investigator]; Romero, J. R., & Varman, M. [Co-Investigators]. HPV study, a safety and immunogenicity study of quadrivalent HPV (Types 6, 11, 16, 18) L1 virus-like particle (VLP) vaccine in preadolescents and adolescents. Merck & Company — $55,328 — (1 December 2003 -Present).

Chatterjee, A. [Principal Investigator]; Romero, J. R., & Varman, M. [Co-investigators]. Safety and immunogenicity of DAPTACEL (CP10/5/5/3DT Aventis Pasteur 5-component pertussis vaccine in combination with tetanus and diptheria toxoids adsorbed) administered as a fifth dose with IPV and MMR in four- to six-year-old children previously immunized with PentacelTM (HCP20/20/5/3DT-mIPV/PRP-T). Aventis-Pasteur — $135,300 — (1 September 2003-Present).

Chiou, R. [Principal Investigator]. Randomized double-blind placebo-controlled parallel group study of the efficacy safety of dutasteride 0.5 mg administered once daily for four years to reduce the risk of biopsy-detectable prostate cancer. GlaxoSmithKline Company — $17,860 — (12 August 2003).

Chiou, R. [Principal Investigator]. A twelve-week, randomized, double-blind, placebo-controlled parallel group multicenter study to evaluate the efficacy of enablex (darifenacin) 15 mg OD on increase in warning time the time from first sensation of urgency to voiding in patients with overactive…. Novartis Pharmaceuticals Corporation — $1,047 — (1 May 2004).

Clark, R. [Principal Investigator]; Mooss, A., & Del Core, M. [Co-Investigators]. Phase IIIb-IV randomized open label trial evaluating the efficacy and safety of tenecteplase together with unfractionated heparin prior to early PCI as compared to standard primary PCI in patients with acute myocardial infarction (accent IV PCI). Boehringer Ingelheim Pharmaceuticals, Inc. — $1,500 — (1 December 2003).

Cullen, D. [Principal Investigator]. In vivo mechanisms of local statin-induced bone. NIH — $24,000 — (1 April 2004-31 March 2006).


Del Core, M. [Principal Investigator]; Mooss, A., & Mohiuddin, S. [Co-Investigators]. Interventional fellowship program. Cordis Corporation — $15,000 — (1 January 2004).


Dey, B. [Principal Investigator]. Insulin like growth factor 1 receptor (IGFIR) signaling in mallalian cells. State of Nebraska — $210,000 — (1 July 2003-30 June 2004).


Enarson, C. [Principal Investigator]. Creighton University animal resource facility: Enhancement (year 2) as a research core facility. State of Nebraska — $85,075 — (1 July 2003-30 June 2004).

Enarson, C. [Principal Investigator]. Enhancement of animal research facility (ARF) as a research core facility. State of Nebraska — $200,000 — (1 July 2003-30 June 2004).


Frey, D. [Principal Investigator]. A multicenter, double-blind, randomized study to compare the efficacy and safety of levofloxacin 750 mg once daily for five days versus ciprofloxacin twice daily for ten days in the treatment of complicated urinary tract infection or acute pyelonephritis. Ortho-McNeil Pharmaceuticals — $30,000 — (2004-present).

Frey, D. [Principal Investigator]. A multidisciplinary intervention to optimize the recovery of elderly patients hospitalized with community acquired pneumonia. ASP-CHEST Foundation Geriatric Development Research Award (Lee E. Morrow, MD). Member, Mentorship Team for Dr. Morrow.


Frey, D. [Principal Investigator]. A randomized, double-blind, parallel group study to investigate the safety and efficacy of treatment with dutasteride and tamsulosin, administered once daily for four years, alone and in combination, on the improvement of symptoms and clinical outcome in men with moderate to severe symptomatic benign prostatic hyperplasia. GlaxoSmithKline Pharmaceuticals — $140,000 — (31 January 2004).


Fritzsch, B. [Principal Investigator]. Constructing a ngn1/Math1 knockin mouse. NIH — $49,496 — (1 September 2003-31 August 2004).


Fritzsch, B. [Co-Principal Investigator]. The molecular biology of neurosensory systems. NIH — $1,906,001 — (1 August 2003-31 July 2008).


Fritzsch, B. [Principal Investigator]; & Beisel, K. [Co-Investigator]. Cellular interaction during ear development. NIH — $1,001,040 — (1 September 2002-31 August 2005).


Goering, R. [Principal Investigator]. Expansion of virology and immunology as research centers of excellence. State of Nebraska — $20,000 — (1 July 2003-30 June 2005).


Hanson, N. [Principal Investigator]. Research protocol for molecular characterization of AmpC resistance. Spectrum Health — $180 — (1 May 2004).


He, D. Z. Z. [Principal Investigator]. Mechanoelectrical transduction in adult cochlear hair cells. NIH-NIDCD — $200,000 — (1 April 2003-31 March 2005).
Heaney, R. P. [Principal Investigator]. Analysis of the physical state of the calcium fortificant in a variety of calcium fortified beverages. Dairy Management, Inc. — $4,000 — (1 August 2003).


Heaney, R. P. [Principal Investigator]. Longitudinal study of a pre-osteoporosis population. HFF [support ended; study remains ongoing].


Heaney, R. P. [Principal Investigator]; Lund, R., & Dowell, S. [Co-Investigators]. Phase IV double-blind, double-dummy, single-center, randomized, active-controlled cross over study to evaluate the effects of two vitamin-D compounds zemplar and calcijex on intestinal absorption of calcium. Abbott Laboratories — $22,500 — (15 April 2004).


Huerter, C. [Principal Investigator]; Kenik, J., & Hurley, J. [Co-Investigators]. Multicenter open label study to observe the effect of etanercept on joint and skin disease in subjects with psoriatic arthritis. Immunex Corporation — $1,200 — (1 November 2003).


Lappe, J. [Principal Investigator]; & Cullen, D. [Co-Investigator]. Exercise and calcium effect on pubertal bone gain. NIH — $224,438 — (1 April 2004-31 March 2005).


Li, H. [Principal Investigator]; Hee, T., & Rovang, K. [Co-Investigators]. Ventricular arhythmia suppression trial. Guidant Corporation — $2,100 — (1 September 2003).


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Marcil, W. [Principal Investigator]; Wilson, D., Petty, F., & Ramaswamy, S. [Co-Investigators]. Comparison of efficacy and safety of continuing olanzapine to switching to quetiapine in overweight or obese patients with schizophrenia or schizoaffective disorder. Eli Lilly & Company — $14,001 — (24 March 2004).

McQuillian, R. [Principal Investigator]. Anesthesiology research program start-up. HFF — $30,000 — (1 July 2003-30 June 2005).


Mohiuddin, S. [Principal Investigator]. Step out Omaha. State of Nebraska — $3,500 — (1 July 2003).


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Rendell, M. [Principal Investigator]. Multicenter double-blind, randomized, parallel-group study to compare the effect of twenty-four weeks treatment with LAF237 (50 mg qd or bid) to placebo as add-on-therapy in patients with type 2 diabetes inadequately controlled with pioglitazone monotherapy. Novartis Pharmaceuticals Corporation — $1,149 — (1 March 2004).


Rendell, M. [Principal Investigator]. Phase III randomized, double-blind, active-controlled, multicenter trial to evaluate the safety and efficacy of BMS-298585 in combination with metformin compared to pioglitazone in combination with metformin in subjects with type 2 diabetes who have inadequate ... Bristol-Myers Squibb — $30,938 — (1 October 2003).

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Romero, J. R. [Principal Investigator], & Chatterjee, A. [Co-Investigator]. A phase IIb, open, randomized, controlled, multicenter study of the immunogenicity and safety of GSK biologics’ inactivated hepatitis A vaccine [Havrix@720 ELU/0.5 mL dose] administered on a 0, 6-month schedule concomitantly with Wyeth Lederle's pneumococcal conjugate vaccine (PrevnarTM) in healthy children fifteen months of age. $61,451 — (1 September 2003-Present).

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Silberstein, P. [Principal Investigator]; & Caracioni, A. [Co-Investigator]. Randomized open-label, multicenter study of darbepoetin alfa administered once every two weeks (q2w) compared with rhuepo administered once every week (qw) for the treatment of anemia in subjects with non-myeloid malignancies receiving multicycle chemotherapy. Amgen, Inc. — $170,519 — (1 August 2003).


Swanson, P. [Principal Investigator]. Flow cytometry core facility for molecular and cellular applications. State of Nebraska — $72,710 — (1 September 2003-31 August 2004).


Townley, R. [Principal Investigator]. Multicenter randomized, double-blind, parallel group, forty-week comparison of asthma control using bronchial hyperresponsiveness as an additional guide to long-term treatment in adolescents and adults receiving either fluticasone propionate/salmeterol diskus ... GlaxoSmithKline Company — $31,800 — (1 September 2003).


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Bowen, C. M. Determining the ionization cross sections of the M sub-shells of tungsten by x-ray fluorescence. Master of Science (Physics) — Dr. Sam J. Cipolla (Major Advisor).


Warnasooriya, N. The search for the X(1750) in ultra-peripheral collisions at STAR. Master of Science (Physics) — Dr. Janet Seger (Major Advisor).

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Gronstal, D. Integrating detector functionality into slow controls at STAR. Master of Science (Physics) — Dr. Michael Cherney (Major Advisor).

Reisbig, M. Mechanisms of regulation and resistance for plasmid-encoded ampC β-lactamase genes. Doctor of Philosophy (Medical Microbiology) — Dr. Nancy D. Hanson (Major Advisor).

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Black, J. Detection of plasmid-mediated AmpC β-lactamases. Master of Science (Medical Microbiology) — Dr. Kenneth S. Thomson (Major Advisor).

Herrera, V. L. Regulation of blafox5b expression within two different genetic backgrounds: K. pneumoniae and Escherichia coli. Master of Science (Medical Microbiology) — Dr. Nancy D. Hanson (Major Advisor).
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