

**Abstracts for
2005
Irwin H. Lepow
Medical Student Research Day**

Thursday, March 10, 2005

Title	Influence of Multidisciplinary Breast Cancer Tumor Board Presentations on Breast Cancer Treatment
Student Presenter	Stacy Banerjee
Co-Workers and Collaborators	Pingfu Fu, Priya Jain, Beth Overmoyer, and Paula Silverman
Advisor	Paula Silverman
Departments	Department of Hematology and Oncology Department of epidemiology & biostatistics
Institutions	University Hospitals of Cleveland Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Postoperative systemic adjuvant treatment improves breast cancer survival (Early Breast Cancer Trialists Collaborative Group, 1988). The NCI has developed standards for adjuvant hormonal treatment and chemotherapy for breast cancer. Du and his colleagues have found a discrepancy between these recommendations and treatment, finding that in a community setting, women under the age of 45 were almost twenty times more likely to receive chemotherapy than women over 70 (Du, 2003). We hypothesized that elderly women are more likely to receive standard adjuvant breast cancer treatment recommendations when their clinical cases are presented at a Multidisciplinary Breast Cancer Tumor Board (MBCTB) compared with treatment offered to elderly women in a community setting. The CASE Comprehensive Cancer Center MBCTB is a meeting of breast cancer specialists including medical oncologists, surgeons, pathologists, and radiation oncologists where treatment recommendations are made for new patients. Tumor specifics, patient demographic data, and treatment recommendations from MBCTB on 167 women presented at conference were compared to national standards and to the treatment that the women ultimately received. MBCTB recommendations agreed with standards in 33% of Stage I, and 68% of Stage II-IV cases, including 80% agreement in those over 70 years of age. We believe this led to our finding of a significant correlation between age and actual treatment ($p=0.044$), with 77% of women over 70 receiving recommended treatment. These data suggest that clinical presentation at a MBCTB encourages adherence to adjuvant breast cancer treatment standards for elderly women who may otherwise receive compromised care due to age bias.</p>	
Support	<p>Du, X, C. Key, C. Osborne, J. Mahnken, and J. Goodwin. Discrepancy between Consensus Recommendations and Actual Community Use of Adjuvant Chemotherapy in Women with Breast Cancer. <i>Ann Intern Med</i> 2003; 138:90-97</p> <p>Early Breast Cancer Trialists Collaborative Group. Effects of Adjuvant Tamoxifen and of Cytotoxic Therapy on Mortality in Early Breast Cancer. <i>N Engl J Med</i> 1988; 319: 1681-92.</p>
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Doublesex: Structure and Function in Drosophila Sex Determination
Student Presenter	James Bayrer
Co-Workers and Collaborators	Wei Zhang, Yanwu Yang
Advisor	Michael Weiss
Departments	Pharmacology Biochemistry
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Sex determination among metazoans is a regulated by a seemingly diverse set of factors. Recent evidence suggests that while the master controls of sex differentiation are widely divergent, key downstream elements may be highly conserved. A novel zinc DNA-binding motif termed the DM domain (named for the transcription factors Doublesex and Mab-3 found in Drosophila and C. elegans, respectively) has been identified in several organisms. Several examples now exist in both invertebrates and vertebrates of sex reversal associated with the loss of DM-containing genes. The Drosophila melanogaster protein Doublesex (DSX) is an alternately spliced transcription factor necessary for sexual differentiation. A potent modulator of the yolk protein gene (yp), the male isoform of DSX (DSXM) represses yp expression whereas the female isoform (DSXF) enhances expression. DSX is composed of two recognized domains, an amino-terminal domain that contains the DM domain and a carboxy-terminal domain that is responsible for oligomerization. Due to sex-specific RNA splicing, a C-terminal extension of the dimerization domain contains alternative sex-specific polypeptide sequences with opposite gene-regulatory properties. A point mutation in a genetically female fly at position 398 (G398D) results in an intersex phenotype and complete loss of DSX oligomerization in vitro, thus implying that oligomerization is crucial to DSX function. My work focuses on the structure and function of the novel DSX dimerization domain. These studies seek to define the dimerization domain's three-dimensional structure and functional characteristics. Integral to the function of DSXF is the transcriptional coactivator Intersex (IX), a homolog of which has recently been found in humans as a subunit of the Mediator complex. With the structure of the dimerization domain now in-hand, we seek to elucidate how this structure allows for specific binding interactions with IX, and the mediation of female-specific development in Drosophila.</p>	
Support	MSTP NIH
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Breaking the Language Barrier: A Case Study on Communication between Physicians and Patients who Speak Different Languages
Student Presenter	Todd Borg
Co-Workers and Collaborators	
Advisor	James W. Campbell, M.D., M.S.; Kathy Cole-Kelly MS., MSW
Departments	MetroHealth Family Medicine Center
Institutions	MetroHealth Medical Center
Body of Abstract (300 words or less)	
<p>Background: Communication between a physician and a patient is an essential part of healthcare. Communication is only made more difficult when language barriers exist. Different studies have shown that patient satisfaction is improved when a physician speaks the same language as their patients (Erzinger S., Cult Med Psychiatry. 1991 Mar;15(1):91-110. and Mazor SS., Archive of Pediatrics and Adolescence Med. 2002 Jul;156(7):693-5.). However, not everyone can speak a different language or has time to take a course in a different language.</p> <p>Methods: 70 English-speaking patients and 47 Spanish-speaking patients participated in taking post-exam surveys to determine what doctors do to communicate with their patients and which methods patients perceived as most helpful. The survey was based on Likert scale type questions and on ranking the top three modes of non-verbal communication from a list of nine choices. The results of the English-speaking group were compared to the results of the Spanish-speaking group using a Wilcoxon-Rank-Sum test and t-tests.</p> <p>Results: Both English speakers and Spanish speakers chose the doctor's writings as their first choice of communication styles used to supplement normal verbal exchanges. Regarding this preference, 74% of English-speaking patients and 70% of Spanish-speaking patients said that the doctor never wrote anything for them. Despite this fact, 92% of English-speaking patients and 77% of Spanish-speaking patients were satisfied with the amount of written material given. The study also found that Spanish-speaking patients said that doctor's writings were more effective than having an interpreter facilitate the discussion.</p> <p>Conclusions: Both Spanish- and English-speaking patients prefer written communication as a means of supplementing the normal verbal exchange. Doctors do well at knowing when to supplement communication among their English-speaking population, but could improve with their Spanish-speaking population. It was also concluded that Spanish speakers prefer having the doctor write something over having an interpreter.</p>	
Support	This project was funded through Saint Luke's Foundation of Cleveland and the Crile Fellowship
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Genetic Resistance to Diet-Induced Obesity in Chromosome Substitution Strains of Mice
Student Presenter	Lindsay C. Burrage (1)
Co-Workers and Collaborators	Annie E. Hill (1), Jonathan B. Singer (2), David V. Conti (3), Colleen Croniger (4), Mark Daly (2), Eric S. Lander (2)
Advisor	Joseph H. Nadeau (1)
Departments	(1) Department of Genetics (3) Department of Preventive Medicine (4) Department of Nutrition
Institutions	(1) Case Western Reserve University (2) The Broad Institute of MIT and Harvard (3) University of Southern California (4) Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Although obesity has emerged as a major public health problem, few susceptibility genes have been discovered. Interestingly, several inbred strains of mice are resistant to diet-induced obesity and provide important tools for gene discovery. For instance, A/J males gain ~50% less weight than C57BL/6J (B6) males on a high fat, simple carbohydrate (HFSC) diet even though the strains show similar weight gain on regular chow. To identify A/J chromosomes that harbor obesity resistance genes, B6-ChrA chromosome substitution strains (CSSs) were used. B6-ChrA CSSs are a panel of 22 strains in which each A/J chromosome is substituted for the corresponding chromosome on the B6 background. The CSS weight gain survey revealed 17 chromosomes with at least one gene that confers obesity resistance. Genetic dissection of one of these chromosomes (chromosome 6) revealed several resistance genes, suggesting that the CSS survey underestimated gene number.</p> <p>To investigate the pathogenesis of the obesity resistance conferred by the genes on chromosome 6, we examined food intake and several key metabolic parameters in B6, A/J, and B6-Chr 6A males. Food intake does not explain the resistance because B6 males did not consume significantly more food than A/J and B6-Chr 6A, the two resistant strains. By contrast, significant metabolic differences were observed. In response to the diet, both A/J and B6-Chr 6A males developed hypertriglyceridemia with decreased hepatic triglyceride content relative to B6, indicating that A/J chromosome 6 harbors genes that confer hypertriglyceridemia and resistance to obesity and fatty liver. Consequently, at least one gene on chromosome 6 may be associated with defects in triglyceride metabolism. Further integrated genetic, physiological, and behavioral studies of B6-Chr 6A and other resistant CSSs will lead to the discovery of new obesity resistance genes, a deeper understanding of the etiology of diet-induced obesity, and perhaps new drug targets.</p>	
Support	Funded in part by grants from the NCRR, the Ohio Board of Regents, and the Charles B. Wang Foundation. L.C.B. is supported by MSTP training grant T32 GM07250
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Fibroblast Growth Factor Enhances the Chondrogenic Differentiation of Adult Human Mesenchymal Stem Cells
Student Presenter	Lucas J. Burton
Co-Workers and Collaborators	Kitsie Penick, Jean F Welter, Arnold I. Caplan, Victor M. Goldberg
Advisor	Luis A. Solchaga
Departments	Departments of Orthopædics and Biology
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Introduction: Injured articular cartilage does not repair spontaneously, resulting in progressive degeneration of the joint and development of osteoarthritis. The goal of tissue engineering and regenerative medicine is to develop implantable tissues in vitro that could be used to replace damaged tissue in vivo. Bone marrow derived mesenchymal stem cells (MSCs) have the potential to differentiate into cartilage. It is our hypothesis that MSCs cultured in fibroblast growth factor (FGF)-containing medium will exhibit greater proliferation and enhanced chondrogenic potential than those cultured in control medium.</p> <p>Methods: Human bone marrow-derived MSCs were cultured in either control medium or FGF-containing medium. First passage MSCs from both conditions were then introduced into an in vitro chondrogenic culture model (pellets), and cultured under identical chondrogenic conditions for up to 4 weeks. Pellets were harvested for analysis at several time points throughout the experimental period. The DNA and GAG content of the pellets were analyzed to assess cell proliferation and extracellular matrix (ECM) production respectively. The pellets were also analyzed histologically.</p> <p>Results: Analysis of the DNA content in the pellets demonstrated no significant differences between the two study groups. Additionally, the DNA content of the pellets appears to remain constant for the duration of the experiment. Pellets made with cells expanded in the presence of FGF produced more ECM than the control pellets. Pellets made with FGF-treated cells produced matrix twice as fast as pellets made with control cells. Histologically, pellets made with cells expanded in the presence of FGF were larger, contained cartilage of better quality, and developed cartilage more rapidly than those made with cells expanded in control medium.</p> <p>Conclusion: MSCs cultured in FGF-containing medium showed improved chondrogenic differentiation in comparison to those cultured in control medium. This finding was evidenced by the superior cartilage produced by the cells that were initially cultured in FGF-containing media versus control media. Further studies are needed to conduct a more in-depth analysis/comparison of the matrices and to identify the intra-cellular mechanisms responsible for the variation between study groups.</p>	
Support	Arthritis Foundation Biomedical Research Grant. NIH/NIAMS R01 AR37726 Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Suppressors of Stomatin-like Chaperones Suggest Sulfated Sterols Stimulate Sleeping <i>C. elegans</i>	
Student Presenter	Bryan Carroll	
Co-Workers and Collaborators	Au J, Hubbard M	
Advisor	Sedensky M, Morgan P	
Departments	Department of Genetics Department of Anesthesiology	
Institutions	Case Western Reserve University University Hospitals	
Body of Abstract (300 words or less)		
<p>The molecular targets of volatile anesthetics remain unclear despite over 150 years of use. We are investigating the mechanism of volatile anesthetics by characterizing <i>C. elegans</i> genes that confer greater sensitivity to volatile anesthetics, as measured by immobility. One branch of these interacting genes begins with the stomatin-like proteins <i>unc-1</i> and <i>unc-24</i>. Stomatin-like proteins are conserved from humans through bacteria. Stomatin-like proteins typically function as membrane bound protein chaperones that regulate protein/membrane trafficking and proteolysis. To better understand the role of stomatin-like proteins <i>unc-1</i> and <i>unc-24</i> in <i>C. elegans</i> neurons and in modulating volatile anesthetic sensitivity, genetic suppressors of <i>unc-1</i> were isolated. The goal of using genetic suppressors is to find interacting genes with known functions. Two genes that suppress the uncoordinated phenotype of <i>unc-1</i> were created, mapped, and cloned. They have been added to a new gene family named Suppressor of Stomatin Uncoordination, <i>ssu</i>. In addition to reversing the locomotion defect of stomatin-like proteins <i>unc-1</i> and <i>unc-24</i>, the two suppressors <i>ssu-1</i> and <i>ssu-2</i> reverse the volatile anesthetic sensitivity phenotype of <i>unc-1</i>.</p> <p>Supporting the predicted chaperone function of stomatin-like proteins, <i>ssu-2</i> combines two neighboring, computer-predicted genes to create a product with similarity to a chaperone family that transports proteins across membranes.</p> <p>The function of the second suppressor suggests that sterol metabolism/signaling can modulate the neuronal dysfunction resulting from loss of stomatin-like proteins <i>unc-1</i> and <i>unc-24</i>. <i>ssu-1</i> is the only cytosolic sulfotransferase in worms. Cytosolic sulfotransferases attach sulfate to an alcohol of small molecules such as steroids and neurotransmitters. The sulfate can either activate or neutralize the biological affect of the substrate molecule. Phenotypic data supports sterols as the relevant substrate involved with our allele of <i>ssu-1</i>.</p> <p>Discovering the genetic suppression of <i>unc-1</i> and <i>unc-24</i> by a chaperone and a potential sterol modifier refines the model of neuronal stomatin-like proteins functioning as membrane chaperones at the foundation of consciousness.</p>		
Support	Depts Anesthesiology, Genetics, and MSTP	
Do you have previous research experience?	Yes	
Please choose your academic program:	MD, PhD	

Title	Use of the RTOG RPA Classification System and Predictors of Survival in 19 Women with Brain Metastases from Ovarian Cancer
Student Presenter	Philip G. Chen
Co-Workers and Collaborators	Shih-Yuan Lee, MSPH
Advisor	John H. Suh, MD
Departments	Radiation Oncology
Institutions	Cleveland Clinic Foundation
Body of Abstract (300 words or less)	
<p>Background: Brain metastasis is an uncommon complication in women with primary ovarian cancer; thus, little is known about whether the Radiation Therapy Oncology Group (RTOG) recursive partitioning analysis (RPA) prognostic classification system is valid in this patient population. We also looked for additional factors that affected patient survival, but which were excluded from the RTOG classification system.</p> <p>Methods: From September 1985 to June 2002, 19 patients with brain metastases resulting from primary ovarian cancer underwent treatment at the Cleveland Clinic Foundation. The medical records of these patients were retrospectively reviewed.</p> <p>Results: At the time of data analysis, all 19 women had died. The median age at diagnosis of primary ovarian cancer and brain metastasis was 51 and 54 years of age, respectively. Sixteen patients presented with Karnofsky performance status (KPS) \geq 70. Seven patients had a single brain lesion and 12 had multiple lesions. All RTOG RPA prognostic classes were represented with median survivals of 24.7, 8.9, and 2.6 months, for classes I, II, and III, respectively (P=0.31). Patients that underwent surgical resection survived longer than those who did not (33.7 versus 7.4 months; P=0.006). The presence of multiple lesions was adversely related to survival on multivariate analysis (P=0.03). Primary control was an important predictor of survival on multivariate analysis as well (P=0.01) and was achieved in 15 of the 19 women.</p> <p>Conclusions: This is the first study to support the prognostic usefulness of the RTOG RPA class system for ovarian cancer patients with metastasis to the brain. The number of metastatic intracranial lesions should be included when determining the prognosis. Patients with good prognoses can benefit from aggressive treatment, and surgical resection should be performed when possible.</p>	
Support	Crile Research Fellowship and American Cancer Society Joseph S. Silber Student Fellowship Program
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Electrophysiological Properties of Anatomically Identified Neurons in the Olfactory Tubercle of the Rat Brain
Student Presenter	Elizabeth Chiang
Co-Workers and Collaborators	Ramani Balu, Todd Pressler
Advisor	Ben Strowbridge
Departments	Neuroscience
Institutions	CWRU
Body of Abstract (300 words or less)	
<p>Relatively little is known about the olfactory tubercle, a prominent part of the rat brain that lies on the ventral surface medial to the piriform cortex. While its connections have not been fully explored, the tubercle receives input from the olfactory bulb and projects to the mediodorsal thalamus, and is therefore likely involved in olfactory processing. We used whole-cell patch-clamp recording in rat brain slices combined with vital microscopy to study the electrophysiological properties and morphology of neurons in the tubercle. By combining the electrophysiological properties and the anatomical morphology of neurons, we categorized the neurons into different types. Cells were classified as either medium cells (between 8 and 20 microns) or large cells (>20 microns) depending on the size of their soma. The majority of medium cells as well as some large cells we recorded from had properties similar to regular spiking pyramidal cortical neurons including spike frequency adaptation and increased spike frequency with larger depolarizing steps. A small fraction of medium and large neurons had a plateau potential that persisted after short current steps. Another distinctive group of large neurons showed a delayed depolarization with a hyperpolarizing step. We are currently investigating the biophysical mechanisms that underlie these phenomena. The specialized physiological properties of different types of tubercle neurons are likely to indicate their functional role in the tubercle circuitry.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	A Qualitative Study on Those Who Care for Alzheimer Patients
Student Presenter	Hana Choy
Co-Workers and Collaborators	Kieu Smith
Advisor	Alex P. Auchus, M.D.
Departments	Department of Neurology
Institutions	Case Western Reserve University School of Medicine
Body of Abstract (300 words or less)	
<p>It has been predicted that by the year 2030, 22% of the US population will be 65 years of age or older. With the “graying” of the nation, there will be an increasing need to attend to the morbidities associated with a longer lifespan. With that, comes the need to address the ever-growing group of caregivers who look after their loved ones for longer than caregivers have in the past.</p> <p>The particular situation of caring for a loved one with a cognitively debilitating disease, such as Alzheimer’s, further calls for a need to study the differences and the unique resources caregivers of Alzheimer’s patients may need versus caregivers of patients with other diseases.</p> <p>This study's primary question is what are some of the coping mechanisms used by caregivers of Alzheimer patients, and secondarily the study wants to look at the difficulties faced by caregivers of Alzheimer patients.</p> <p>The study is split into two parts: (1) a questionnaire and (2) interview. The main purpose of the questionnaire is to find those caregivers who are suitable to interview. The interview consists of 7 questions. The subject will be doing most of the talking, responding to questions that will ask of early warning signs, current struggles, and coping mechanisms. The interview must be taped and done in person.</p> <p>The interviews are transcribed and analyzed for coping mechanisms and difficulties relating to the caregiving of an Alzheimer patient. Common themes are drawn across all interviews and it is noted which coping mechanisms and difficulties are most significant.</p> <p>Thus far it has been found that having a hobby or activity that gives the caregiver time alone and away from the patient is one coping mechanism that crosses all interviewees.</p> <p>As of today, the interviews and analysis of them have not yet been completed, therefore conclusions cannot be drawn yet.</p>	
Support	Primary Care Track grant Crile Fellowship grant Fairhill Center of Aging (registration center)
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Does the use of an echo-enhanced needle tip improve time to blood return in a vascular access model?
Student Presenter	Nora Colburn
Co-Workers and Collaborators	Charles Emerman, MD
Advisor	Michael Phelan, MD
Departments	Department of Emergency Medicine
Institutions	The Cleveland Clinic Foundation, MetroHealth Medical Center
Body of Abstract (300 words or less)	
<p>Background: Ultrasound is often used to help place central venous catheters in an effort to aide novices in mastery of the skill and to avoid complications. Echoenhanced needles are available commercially, but it is unknown whether they have any advantage over standard needles.</p> <p>Question: This study examines whether the use of an echo tip needle during ultrasound guided vascular access will result in faster time to blood flash, fewer needle sticks, and fewer needle redirections compared to a standard needle.</p> <p>Methods: Emergency Medicine residents and staff members were shown a 10 minute video demonstrating ultrasound technique. Vascular access was obtained on a Blue Phantom venous model using both the echoenhanced and standard needles. Time to blood flash, number of directions, and number of sticks were measured. Subjects then rated the performance of the echoenhanced needle on a Likert scale.</p> <p>Results: There was no significant difference in time to blood flash, number of sticks, or number of redirections. However, 47.2% of subjects reported that the echoenhanced needle performance was minimally, moderately, or markedly better than the standard needle. 41.7% reported no change in performance.</p> <p>Conclusions: While no specific difference in the needles was measured, the subjects' perceptions of increased performance was evident.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	PCL-YV
Student Presenter	David Danish
Co-Workers and Collaborators	Dr. Thomas Evans, PhD
Advisor	Dr. Thomas Evans, PhD
Departments	Child Psychiatry
Institutions	CWRU & Cuyahoga County Juvenile Court
Body of Abstract (300 words or less)	
<p>The relationship between personality traits and recidivism in adult criminal offenders has been well documented; however, there are few studies investigating this relationship in juvenile offenders. The Psychopathy Checklist-Youth Version (PCL:YV; Forth, Kosson, & Hare, 1997) is a 20-item measure of symptoms and characteristics of youth psychopathy. These items reflect the following domains: interpersonal, affective, behavioral, and antisocial. Each symptom/characteristic is rated on a 3-point scale (0 = item doesn't apply, 1 = item applies somewhat, 2 = item definitely applies), and ratings are based on lifetime functioning. The current study is retrospective chart review investigating the relationship between scores on the PCL:YV and rates of recidivism in 100 juvenile offenders in an urban Midwestern juvenile detention center. The primary hypothesis is that scores on the PCL:YV will positively correlate with rates of recidivism. Results will have important clinical implications for future assessment and treatment of juvenile offenders</p>	
Support	MPH Program
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Expression of the dexamethasone-induced inositol-1,4,5-trisphosphate receptor mimics the dexamethasone-mediated elevation of cytosolic calcium and induces apoptosis
Student Presenter	Michael C. Davis
Co-Workers and Collaborators	Michael H. Malone, Zhengqi Wang, Karen McColl, Fei Zhong, , Irma Lengu, H. Llewellyn Roderick
Advisor	Clark W. Distelhorst
Departments	Department of Pharmacology; Division of Hematology /Oncology, Department of Medicine
Institutions	Case Western Reserve University; The Babraham Institute, Cambridge, UK
Body of Abstract (300 words or less)	
<p>Glucocorticoids are critical regulators of immune system physiology and are used to treat hematological malignancies. Their efficacy stems from their ability to induce a transcription-dependent form of programmed cell death in immature lymphocytes. Understanding the mechanism by which glucocorticoids induce apoptosis in lymphoid cells will allow for more effective therapies with fewer side effects. Using microarray analysis, we found that the potent synthetic glucocorticoid dexamethasone induced the types 1 and 2 inositol-1,4,5-trisphosphate receptors (IP3Rs) in two murine lymphoma cell lines. Northern and Western blots confirmed the inductions at the message and protein levels. Since IP3 receptors control the flux of calcium from the endoplasmic reticulum to the cytosol, we hypothesized that the IP3R induction may alter intracellular calcium homeostasis, and that apoptosis may result from these alterations. Indeed, cytosolic calcium increased, while the thapsigargin-releasable calcium pool, an indirect measure of endoplasmic reticulum luminal calcium, decreased following the dexamethasone-mediated induction of the IP3R. Overexpression of an IP3R1-YFP fusion protein was sufficient to mimic the dexamethasone-induced elevation of cytosolic calcium. In addition, cells expressing YFP-IP3R1 were five-times more likely than the control cells to be apoptotic. These data suggest that the induction of the IP3R by dexamethasone may provide a mechanism for the well-established observation of altered intracellular calcium homeostasis following glucocorticoid treatment. Furthermore, IP3R induction-mediated dysregulation of calcium homeostasis may play a causal role in glucocorticoid-induced apoptosis.</p>	
Support	Hematology/Oncology Training Grant; Medical Scientist Training Program; NIH R01 CA042755-17 (CWD)
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Reducing Costs without Compromising Quality in the Pediatric Allogenic Transplant Setting
Student Presenter	Katie Ellerbrock
Co-Workers and Collaborators	Vicki L Fisher, CPNP, Francis Casey, BS and Michael Nieder, MD
Advisor	Dr. Michael Nieder, MD
Departments	Pediatric Hematology/Oncology
Institutions	Rainbow Babies and Children's Hospital, Cleveland, OH; All Children's Hospital, St. Petersburg, FL
Body of Abstract (300 words or less)	
<p>Blood and Marrow Transplantation (BMT) is a costly procedure. In 1998, Rainbow Babies and Children's Hospital began to institute practices aimed at reducing costs without compromising quality and outcomes. These changes in practice were sequentially introduced over a four year period. Several cost reducing strategies were employed including eliminating weekly chest radiographs, limiting laboratory tests, replacing total parenteral nutrition with enteral tube feeds (2001), addition of glutamine (1999) and replacing intravenous tacrolimus with oral tacrolimus for graft vs. host disease (GVH) prevention. The outcomes of 78 consecutive allogenic BMT performed between 1995 and 2004 were analyzed. Parameters for analysis included GVH, day 100 survival, overall survival, engraftment, relapse free survival, days in the pediatric intensive care unit, bacteremia, veno-occlusive disease of the liver and transplant related mortality. There was no significant difference in any outcome parameter when each of the practice changes was analyzed separately or even when taken together. This suggests that institutional supportive care practices should be periodically reviewed for their value, effect on patient care, burden to nursing staff and discomfort to the patient. Future studies analyzing time and cost savings by point of care practitioners should focus on those intensive practices which are not based on sound medical evidence.</p>	
Support	Crile Fellowship, Silber American Cancer Society Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Does signal dropout on two-dimensional time of flight magnetic resonance angiography represent a “critical” stenosis of the internal carotid arteries? Re-assessment of the technique based on the different echo time values
Student Presenter	Bruk Endale
Co-Workers and Collaborators	Javier M. Romero; Michael H. Lev; Alice S. Chau; Caitlin Dwyer-McNally; Chun-Der Li; R. Gilberto Gonzalez
Advisor	Javier M. Romero
Departments	Department of Radiology, Division of Neuroradiology
Institutions	Massachusetts General Hospital and Harvard Medical School Boston, MA 02114
Body of Abstract (300 words or less)	
<p>BACKGROUND AND PURPOSE: Signal dropout, or flow void artifact, is accepted as a sensitive indicator of severe or critical carotid stenosis on two-dimensional (2D) Time-Of-Flight (TOF) Magnetic Resonance Angiography. We sought to determine the influence of Echo Time (TE) and scanner generation on the presence of signal dropout, using Ultrasound Peak Systolic Velocities (PSV) as a gold standard.</p> <p>SUBJECTS AND METHODS: A retrospective review of our neurovascular database from 1998 to 2002 was conducted to identify patients who underwent 2D TOF MRA and carotid DUS. Two board-certified neuroradiologists reviewed the MRA images to determine the presence of signal dropout, and those findings are compared to a Duplex Ultrasound (DUS) standard.</p> <p>RESULTS: Inclusion criteria were met by 72 patients. 107 carotid arteries were studied with DUS and 2D TOF MRA—37 were imaged on a 1.5-T Signa (TE ~4.7ms); 24 were imaged on a 1.5-T LX system (TE ~8.7ms); 46 were imaged on a 1.5-T Signa scanner (TE ~10.6ms). Relative to our standard, the 1.5-T Signa (TE ~10.6ms) displayed a sensitivity of 93.8% and a specificity of 76.5% for critical stenosis (DUS velocities of 350 cm/s or higher). For severe stenosis (DUS of 250 cm/s), the 1.5-T Signa (TE ~10.6 ms) showed a sensitivity of 77.3% and a specificity of 85.7%</p> <p>CONCLUSIONS: Signal dropout on 2D TOF MRA is highly TE dependent. Radiologists, neurologists, and vascular surgeons should be aware of the calibration of their MRA sequences, relative to a gold standard, before basing surgical decisions on these images.</p>	
Support	Case Western Reserve University, Crile Research Fellowship Massachusetts General Hospital and Harvard Medical School
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Using the kccq in an outpatient setting to evaluate hf patients for management decisions and qol assessment
Student Presenter	Emily Evans
Co-Workers and Collaborators	Ileana Pina, Subha Varahan
Advisor	Ileana Pina
Departments	Department of Cardiology
Institutions	University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Background: The Kansas City Cardiomyopathy Questionnaire (KCCQ) is a self-administered questionnaire that quantifies physical limitations, symptoms, self-efficacy, social interference, and quality of life in patients with congestive heart failure (CHF). It has been previously used in a selected patient population that had known or uncompensated CHF with an ejection fraction (EF) of less than 40 and has proven to be valid and reliable health status measure for patients with HF. The aim of this study was to show that the KCCQ can be used to evaluate an outpatient clinic population and correlate with the New York Heart Association (NYHA) as with the selected patient population. It was also to show that the KCCQ correlates with the VO₂ of the outpatient clinic population.</p> <p>Methods: To establish that KCCQ can work in a clinical outpatient population, an unselected patient population at large (n=45) with HF referred to HF clinic was administered the KCCQ prior to an encounter with a physician. VO₂ was measured at the initial clinic visit for all the patients.</p> <p>Results: Our patient population (n=46) age had an average age of 51.43, an average of EF=19.84% and an average VO₂=14.913. The average of all the domains of the KCCQ were as follows: 62.27 for physical limitation, 62.56 for total symptoms, 69.58 for self-efficacy, 43.11 for quality of life, (QoL) 49.53 for social limitation, 54.56 for overall summary, and 62.60 for clinical summary. The KCCQ physical limitation domain correlated with the NYHA classification with the available criterion standards (r=-0.631, p<0.001) which was very similar to that of that of the selected population (n=39, r=-0.65, p<0.001). The KCCQ domain of clinical summary correlated with the VO₂ with the available criterion standards (r=0.40, p=0.006).</p> <p>Conclusion: The KCCQ has been to used to evaluate a clinical outpatient population with HF and has shown correlation of KCCQ physical domain with the NYHA classification, similar to that of the selected population. Additionally, the KCCQ has shown a correlation between the VO₂ and clinical summary domain. The KCCQ, along with the VO₂, can therefore be used in an outpatient setting in evaluation of HF patients for management decisions and QOL assessment.</p>	
Support	Acknowledgements: Funding for this work was provided in part by the NIH HF ACTION trial, the Crile Scholarship and the Student Scholarship in Cardiovascular Disease and Stroke, sponsored by the AHA's/ASA's 13 scientific councils
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	A Novel Approach for the Diagnosis of Alzheimer Disease
Student Presenter	Matthew R. Garrett
Co-Workers and Collaborators	Hyoung-gon Lee, George Perry and Mark A. Smith
Advisor	Mark A. Smith
Departments	Institute of Pathology
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Background: With the ever increasing population of aged individuals who are stricken with AD, the insensitivity and cost of psychometric cognitive assessment and the relative ineffectiveness of treatment following diagnosis, there is an urgent need for a sensitive, highly specific and preferably, non-invasive, diagnostic standard. Unfortunately, to date, despite intensive efforts, there is no definite surrogate marker for the accurate diagnosis of either prodrominal, nor actual, disease. The majority of efforts have focused on auto-antibodies against amyloid-β (Aβ) or tau, the major protein components of the abnormal brain pathology that accumulates in specific brain regions of patients (and incidentally, is used for a definitive postmortem diagnosis). However, the vast majority of studies show little difference in Aβ- or tau-antibodies in sera from patients versus unaffected individuals. In this study, using a novel technique for separating antibodies against Aβ, we found significant differences in serum antibodies to Aβ between AD and aged-matched control subjects that might be used diagnostically.</p> <p>Methods: Blood samples were collected from ‘probable’ AD patients (n=10) and age-matched control subjects (n=15). Following antibody isolation using a proprietary patent-pending technique, antibodies against Aβ were titrated and measured by enzyme-linked immunosorbant assay (ELISA).</p> <p>Results: Consistent with most previous reports, in untreated plasma, both AD and control cases displayed antibodies directed against Aβ, but there were no difference (p = 0.135) between them. However, following antibody separation, sera from AD patients showed significantly elevated levels of antibody against Aβ (p<0.05) compared to the control subjects.</p> <p>Conclusion: Using a novel technique, we find significant increases in serum antibodies against Aβ in patients with AD versus aged-matched controls. The utility of this technique in pro-drominal AD or in predicting conversion to AD is currently being evaluated. Although further work must be completed, our current methodology is likely to facilitate the accurate diagnosis of AD and therefore be a useful tool in the medical management of patients with AD.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Zimmer Corporation “Anatomic” Plate Fit in 100 Cadaveric Proximal Tibias from the Cleveland Museum of Natural History
Student Presenter	Kanu Goyal
Co-Workers and Collaborators	Anthony Skalak
Advisor	Daniel Cooperman
Departments	CASE Department of Orthopedics
Institutions	Cleveland Museum of Natural History
Body of Abstract (300 words or less)	
<p>Zimmer has new “anatomic” plates to fix proximal tibia fractures. However, we predict these plates will not precisely fit all 100 normal right-sided cadaveric tibias in a randomly selected population because of natural anatomic variation. We mapped the proximal tibias and the 8-hole medial and lateral plates using a Microscribe G2LX digitizer, Rhinoceros, and Matlab. Plate fit was defined by plate alignment to the tibial plateau and as the volume of air between the plate and the tibia in three sections: proximal, middle, and distal. Plate alignment with the tibial plateau ranged from 0° to 12° and can be predicted by measuring plateau slopes (lateral: R = 0.929, medial: R = 0.725). The total volume under the medial plate was 1883 +/- 661 mm³, and under the lateral plate was 1751 +/- 470 mm³. Plates with uniformly distributed volume were called Even. Plates that failed to make contact with the middle portion of the tibias were called Spanning. Plates that made premature tibia contact, causing distal plate elevation, were called Impingement. Marked Spanning and Impingement created poor fit. For the medial plate, 26 were Even, 33 Spanned, and 44 Impinged. For the lateral plate, 17 were Even, 78 Spanned, and 8 Impinged. Plate fit can be predicted by measuring medial and lateral proximal contours from an AP image of the tibia. As the medial contour flattened, the distal volume increased due to Impingement (R = 0.608). As the lateral contour deepened, the middle volume increased causing Spanning (R = 0.527). The medial and lateral Zimmer “anatomic” plates were ideal for only 55% and 30% of the tibia, respectively. Proximal tibial contours and plateau slopes can predict plate fit. Our method enabled us to analyze improper plate fit and to determine precisely where plates need more or less contour to adequately fit the entire population.</p>	
Support	Paul Curtiss Fellowship Cleveland Museum of Natural History
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	cAMP-dependent mechanisms regulate hippocampal mossy fiber outgrowth and regeneration
Student Presenter	Christy Gray
Co-Workers and Collaborators	Stephanie Schnetz, Daniel Vogt, Stephanie Orellana, and Alfred Malouf
Advisor	Alfred Malouf
Departments	Department of Pediatrics and Neurosciences
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>We have begun to examine cAMP-regulated changes in the outgrowth and regeneration of hippocampal mossy fibers (MFs) in cultured hippocampal slices. Cyclic AMP has been shown to regulate the turning response of growth cones to specific guidance molecules in dissociated neuronal culture systems. This regulation of turning behavior suggests cAMP acts in a spatially restricted manner within the growth cone. However, there is presently no information about how, or if, spatial restriction of cAMP signaling occurs in growth cones during normal pathfinding in intact nervous tissue. Cyclic AMP primarily signals through the cAMP-dependent protein kinase (PKA, A-kinase). The activity of PKA is spatially restricted by A-Kinase Anchoring Proteins (AKAPs). Our immunohistochemical data showed that PKA catalytic subunit alpha, regulatory subunits beta I and beta II, and the AKAP ezrin were expressed in MFs. Our data also demonstrated that increasing cAMP levels inhibited the regeneration of MFs in cultured hippocampal slices, and that the AKAP:RII binding inhibitor Ht-31 altered MF outgrowth. Finally, our co-immunoprecipitation data showed a strong association between ezrin and hnRNP U, an RNA-associated protein found in RNA-transporting granules. These data suggest that ezrin and cAMP are important regulators of MF outgrowth and regeneration. The co-immunoprecipitation data lead to further speculation that ezrin may link PKA activity to RNA translation in the growth cone to regulate axon guidance.</p>	
Support	NIH NINDS NS41383 (ATM)
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Clinical Characteristics and Health Resource Utilization in Geriatric Patients with Mood Disorders with and without Dementia
Student Presenter	Latoya Green-Smith
Co-Workers and Collaborators	Dr. Nicoleta Coconcea, Dr. Martha Sajatovic
Advisor	Dr. Martha Sajatovic
Departments	Psychiatry
Institutions	Case Western Reserve University, University Hospital of Cleveland
Body of Abstract (300 words or less)	
<p>Objective: The challenge of treating geriatric patients with mood disorders may be further complicated by the presence of dementia. Dosing of psychotropic medication and clinical factors may vary with the additional diagnosis of dementia. This retrospective chart-review study evaluated clinical characteristics and medication utilization among geriatric patients with a mood disorder diagnosis, with or without dementia.</p> <p>Methods: Electronic discharge summaries over a one year period were reviewed for 114 elderly patients with a mood disorder. Individuals were categorized as having a diagnosis of dementia with their mood disorder, or not having a diagnosis of dementia with their mood disorder.</p> <p>Results: Compared to the individuals with a mood disorder without dementia (N=55), individuals with a mood disorder plus dementia (N=59) had more psychotic symptoms, agitation and delirium, had lower GAF and MMSE scores, had higher usage of anti-psychotics and lower amounts of ECT treatments. Both groups had substantial medical burden (mean Chronic CIRS score of 11.43).</p> <p>Conclusion: Selected clinical characteristics and medical utilization differ between mood disorder patients with or without dementia. However, both groups have extensive medical burden and utilize numerous psychotropic medications.</p>	
Support	Summer Training On Aging Research Topics-Mental Health Fellowship (START-MH)
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Cardiovascular Disease Prevention in the Elderly: Is there a “Geriatric Treatment Gap”?
Student Presenter	Matthew L. Hansen
Co-Workers and Collaborators	
Advisor	Dr. Joseph Frolkis
Departments	University Hospitals of Cleveland Department of Medicine
Institutions	UHHS, CWRU
Body of Abstract (300 words or less)	
<p>BACKGROUND: Coronary Heart Disease (CHD) is the leading cause of death in Americans over 65 years of age. Clinical trials have demonstrated that the elderly derive at least equivalent benefits from the aggressive control of risk factors such as hyperlipidemia compared to younger persons. However, there is concern that the elderly are less likely to be screened and treated for these risk factors.</p> <p>OBJECTIVE: The objective is to examine the determinants of screening and treatment for hypercholesterolemia in an elderly cohort.</p> <p>METHODS: Chart reviews were performed on 669 patients with at least 2 CHD risk factors. Using guidelines from the National Cholesterol Education Program Third Adult Treatment Panel (NCEP-ATPIII) the proportion of patients who should have been using a lipid-lowering agent (LLA) but were not was calculated. Logistic regression models were used to estimate the association between selected variables and the probability that patients were either screened for cholesterol levels or treated with HMG-CoA Reductase Inhibitors (statins).</p> <p>RESULTS: 36% of patients had not had a cholesterol level screened in the preceding 5 years. Factors positively associated with screening included African American race, exercise, and total number of diagnoses, while age and documented dementia were negatively associated. Thirty percent of patients who were not taking statins should have been, per ATPIII guidelines. Age, race, and reported statin intolerance were significantly negatively correlated with statin use, while education, documented CHD, and 10-year risk were significantly positively correlated with statin use. Among patients with “CHD risk equivalents” per ATPIII definitions, 56% did not achieve target LDL cholesterol.</p> <p>CONCLUSIONS: Patients may be underscreened and undertreated for hypercholesterolemia. Age appears to be negatively associated with both screening and treatment, independent of risk and comorbidity. These results suggest a “geriatrics treatment gap” exists that must be narrowed to reduce the cardiovascular disease burden in this population.</p>	
Support	N American Federation for Aging Research Summer Scholars Program
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Multidisciplinary Treatment of Cleft Palate in Northeast Thailand
Student Presenter	David Jackowe
Co-Workers and Collaborators	
Advisor	
Departments	Anatomy
Institutions	Case School of Medicine
Body of Abstract (300 words or less)	
<p>The incidence of cleft palate in the Issan region of Thailand has been estimated to be 1.5 times greater than the general population. However, the treatment of the cleft palate patient requires more than reconstructive surgery. Often a team of specialists, including ENT's, speech therapists, and orthodontists, is required to evaluate and treat these patients. The establishment of multidisciplinary cleft palate care in the developing world has received the attention of many non-profit organizations. This study examined the development of the multidisciplinary care of the cleft palate patient under the auspices of Smile Train at Khon Kaen University, Thailand over the past five years.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Pericardial Induced Atrial Fibrillation in Post-CABG Patients
Student Presenter	Trevor Jenkins
Co-Workers and Collaborators	
Advisor	Dr. Albert Waldo
Departments	Department of Cardiology, University Hospitals of Cleveland
Institutions	University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Atrial fibrillation (AF) is a frequent complication after coronary artery bypass graft (CABG) surgery. Pericarditis secondary to an inflammatory response due to pericardial trauma has been hypothesized as an etiology for post-CABG AF. Study participants at University Hospitals of Cleveland were followed post-CABG by 12 lead ECG monitoring daily until pacing wire removal. Pericarditis was documented by observation of diffuse ST segment elevations on ECG. Pericarditis was seen in 4 of 13 subjects, with an average onset on post-op day 2. AF was not observed in any study participants. Subjects were followed for an average of 3.7 days post-op. Due to the limited study size, an association between AF and pericarditis could not be established. Inconclusive data due to limited study size warrants further study. A larger study population with post-surgical follow-up until discharge may yield additional information about the relationship between AF and pericarditis</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Reasons for electing to have an induced abortion among women in Greece
Student Presenter	Alexander Kosmidis
Co-Workers and Collaborators	Michael Konstantoulas, MD and Douglas Einstadter, MD, MPH
Advisor	Douglas Einstadter, MD, MPH
Departments	Primary Care Track
Institutions	Case School of Medicine
Body of Abstract (300 words or less)	
<p>Background: For unclear reasons, Greece has nearly triple the worldwide average for abortions. The goal of this study is to find reasons why Greek women choose to have an induced abortion and explain the differences in the rates of abortion for Greece compared to the rest of the world.</p> <p>Methods: We conducted a survey of women presenting for OB/GYN outpatient visits in the cities of Thessaloniki and Athens during June and July of 2004. The survey instrument consisted of questions about life status, demographics, sexual health and a detailed section regarding any prior or planned future abortions. Data obtained from the survey was tabulated on a per question basis as a percentage distribution of all responses to each particular question.</p> <p>Results: A total of 69 women completed surveys; the mean age was 36 years; thirty-two respondents (46%) reported that they had completed at least one abortion. Of those with at least one abortion, 58% answered that they have undergone more than one abortion procedure. Of the 32 who reported undergoing abortion, the three most common reasons for the procedure were: age and level of maturity, financial issues, and the overall readiness for the responsibility of raising a child. When asked whether a woman has ever used prophylactic measures, over 46% of all respondents said no. Also, over 91% of all participants indicated having never had any kind of sexual education in school.</p> <p>Discussion: The most common reasons given for undergoing the procedure mirrored those obtained from studies carried out in the US. The majority finding of having never had any sexual education in school may help explain the disproportionate level of abortion in Greece compared to the rest of the world.</p>	
Support	N/A
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Surgical margin status and locoregional recurrence rates following breast conservation surgery for Stage I and II invasive breast cancer
Student Presenter	Larry A Latson, Jr., M.S.
Co-Workers and Collaborators	Charles Kunos, M.D., Ph.D.
Advisor	Janice Lyons, M.D.
Departments	Department of Radiation Oncology
Institutions	Case Western Reserve University, University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Background: The definition of \pm margins in surgical resection of breast cancer has varied in the literature. One major study (NSABP B-06) considered margins to be free of tumor with enough normal tissue removed to ensure that the specimen margins were tumor-free, \pm while another study (Milan III) suggest that wider 2-3cm margins of resection may be more appropriate. This retrospective study was undertaken to test the hypothesis that the rates of recurrences in women with invasive breast cancer where either tumor free (≥ 2mm) or close (>0 to <2mm) surgical margins remain after breast conserving surgery (BCS) are different. Methods: With IRB approval, the medical records of 341 consecutive women undergoing BCS between 1996 and 2002 were retrospectively reviewed to evaluate tumor free (≥ 2mm) and close (>0 to <2mm) margins, presence of angiolymphatic invasion, and the number of local in-breast, elsewhere in-breast, and regional nodal recurrences. Results: With a median follow-up of 56 months, 14 of 341 women (4.1%) had a recurrence of their breast cancer. Recurrence rates were 1.8% (4 of 222) for women with tumor free (≥ 2mm) margins versus 8.4% (10 of 119) for close (>0 to <2mm) margins. In addition, presence or absence of angiolymphatic invasion was recorded for 267 of 341 specimens (78%). The proportion of women with angiolymphatic invasion who developed a recurrence (6 of 56, 10.7%) was significantly higher than the proportion of women without angiolymphatic invasion who developed a recurrence (8 of 211, 3.8%, $p=0.02$).</p> <p>Conclusions: Our results provide further evidence that BCS achieving tumor free (≥ 2mm) margins reduces local and regional recurrences, compared to BCS achieving only close (>0 to <2mm) margins. They also support evidence in the literature that angiolymphatic invasion is a known predictor of lymph node involvement.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Maternal iron status: Its effects on mood and behavior
Student Presenter	Kristin Lepore
Co-Workers and Collaborators	
Advisor	Dr. Betsy Lozoff
Departments	Center for Human Growth and Development
Institutions	University of Michigan
Body of Abstract (300 words or less)	
<p>Background: Iron-deficiency is the most common nutrient disorder in the world. Many studies have examined the effects of iron-deficiency on non-specific symptoms in women, but these studies have yielded inconsistent results. Additionally, no other studies have examined the effects of maternal iron status on maternal behavior during mother-infant interactions.</p> <p>Hypotheses: We hypothesized that maternal iron-deficiency would be associated with greater maternal depressive symptoms. Additionally, we hypothesized that maternal iron-deficiency would be associated with lower responsiveness and less positive affect among the mothers during interactions with their children.</p> <p>Methods: Data were available for 211 Chilean mothers of 12 month-old infants. Maternal iron status was determined using standard measurements (hemoglobin, mean cell volume, serum ferritin, and free erythrocyte protoporphyrin). Maternal depressive symptoms were measured by the Center for Epidemiologic Studies – Depression scale. Maternal behavior was coded from videotaped mother-infant interactions both during standardized tests of infant development and a brief separation episode. Exploratory data analyses were performed.</p> <p>Results: There was no significant relationship between iron status and CES-D score. However, mother-infant dyads with iron-deficient mothers were significantly less likely to engage upon reunion after a brief separation. Mothers with iron-deficiency were also significantly less likely to respond to their infants’ positive affect during this reunion. During an infant motor development test, mothers with poorer iron status moved away from the infant, beyond arm’s reach, more often. They also demonstrated the task to their children less often. Mothers with lower serum ferritin also showed more emotional expressiveness during testing.</p> <p>Conclusions: We rejected our hypothesis that lower maternal iron status would be associated with more maternal depressive symptoms. Our second hypothesis, that mothers with lower iron status would show less responsiveness and less positive affect in interactions with their children, was supported by findings from the infant motor test interactions and the separation episode.</p>	
Support	<p>Primary Care Track Fellowship, Case Western Reserve University</p> <p>Crile Fellowship, Case Western Reserve University</p>
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Care fragmentation and psychiatric illness is associated with increased emergency department use among complex diabetic patients
Student Presenter	Connie Liu
Co-Workers and Collaborators	Andy O'Connor, MD/MPH, Doug Einstadter, MD/MPH
Advisor	Randall Cebul, MD
Departments	Center for Health Disparities
Institutions	MetroHealth Hospitals
Body of Abstract (300 words or less)	
<p>BACKGROUND: Care of complex diabetic patients is often fragmented among multiple specialists. This investigation determines if psychiatric (Psych) comorbidity among diabetic patients aggravates their fragmented care and results in use of the Emergency Department (ED).</p> <p>METHODS: Socioeconomic characteristics, non-psych comorbidities, and ED visits were identified for 623 diabetic patients with chronic kidney disease (CKD) from the electronic medical record of a large urban health care system. "Fragmentation" was defined as the number of separate non-psych specialty clinics visited. A negative binomial model was used to estimate the effect of Psych disorders and Fragmentation on the number of ED visits after adjusting for socioeconomic characteristics, non-Psych comorbidities, diabetes control (average a1c level over 2 years), and adherence (proportion of "kept" primary care appointments).</p> <p>RESULTS: 241 (38.7%) patients had one or more Psych co-morbidities. On bivariate analysis, the 141 (22.6%) diabetic CKD patients with mood and anxiety disorders were more likely than those without to have at least one ED visit (63.1% vs. 44.6%; OR 1.42, 95% CI, 1.21 to 1.66). After adjusting for covariates, the presence of a mood/anxiety disorder increased the predicted number of ED visits by a factor of 1.50 (95% CI: 1.14 to 1.98), while greater Fragmentation increased the number of ED visits by a factor of 1.32 (95% CI: 1.19 to 1.47) for each additional clinic visited. Psych diagnoses other than mood or anxiety disorders were not associated with increased number of ED visits.</p> <p>CONCLUSIONS: Mood and anxiety disorders are prevalent among patients with complicated diabetes, and are associated with increased fragmentation of care and increased use of the ED. We believe that fragmentation of non-psychiatric care exacerbates the discontinuous nature of psychiatric care, and may contribute to poorer self-management of diabetes and its complications.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Short-Term Mechanical Ventilation Increases Airway Reactivity in Rat Pups
Student Presenter	David Liu
Co-Workers and Collaborators	Christopher G. Wilson, Ph.D., Rebekah Cawley
Advisor	Richard J. Martin, MD
Departments	Department of Pediatrics, Division of Neonatology
Institutions	Rainbow Babies & Children's Hospital, School of Medicine, Case Western Reserve University, Cleveland, OH 44106-6010
Body of Abstract (300 words or less)	
<p>BACKGROUND: Persistent airway hyperreactivity has been well described as a sequela of premature birth and need for mechanical ventilation. Rat pups exposed to prolonged hyperoxia have been shown to develop airway hyperreactivity and have been used as a model of premature lung injury. However, the role of short-term mechanical ventilation in this setting is unknown.</p> <p>OBJECTIVES: We sought to develop a rat pup model to delineate the role of short-term mechanical ventilation in the development of airway hyperreactivity.</p> <p>METHODS: Experiments were performed on Sprague-Dawley rat pups. At 8 days of age, the rat pups were anesthetized, intubated, and ventilated for 4 hours (rate of 100 breaths/min, tidal volume 10ml/kg) at room air, and then returned to the litter. At 10 days of age, (2 days after intervention) pulmonary mechanics were measured on ventilated (n=7) and control rat pups (n=8). Rats were sedated, tracheotomized, and paralyzed after a central venous line was placed. Mechanical ventilation was maintained with a rate of 100 breaths/min, tidal volume 8ml/kg. Rats were placed in a head-out body plethysmograph and baseline lung resistance chemical and electrical stimulation were recorded using BUXCO software. Chemical stimulation was increasing doses of Methacholine IV (cholinergic agonist) administered through the central venous line. Vagal nerves were isolated and electrically stimulated through electrodes at increasing frequency.</p> <p>RESULTS AND CONCLUSIONS: Short-term ventilation appears to demonstrate increased airway reactivity to chemical cholinergic stimulation. Chemical stimulation with increasing doses of Methacholine IV demonstrated a concentration dependent increase in total lung resistance. The lung resistance response was significantly potentiated in animals with prior short-term mechanical ventilation compared to the control group (P<.01). This represents a new model to investigate mechanisms involved in airway hyperreactivity induced by neonatal lung injury.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	A New Look at Freshman Medical Student Specialty Preferences and Gender Differences
Student Presenter	Gregory B. Martin
Co-Workers and Collaborators	Mathew Hansen
Advisor	Dr. Richard Aach
Departments	Residency and Career Planning
Institutions	Case School of Medicine
Body of Abstract (300 words or less)	
<p>In 1985 a study was conducted at the Medical College of Wisconsin (MCW) that examined the perceptions of freshman medical students and the effect of gender on the perceived choice of medical specialty. Significant gender differences were found in specialty choice, expected income, and other personal factors. We sought to examine whether the specialty preference of freshman medical students has changed in the past 20 years. A total of 110 freshman medical students at Case Medical School (58 males and 52 females) were surveyed during orientation. The class specialty preferences were 53.4 percent primary care, 24.8 percent surgery, and 22.0 percent in other specialties, similar to those found in the previous study. We found that 67.3 percent of women and 40.4 percent of men expected to enter a specialty in primary care; 40.4 percent of the men and 7.7 percent of the women chose surgical specialties. A higher proportion of female freshman medical students than the male medical students chose patient contact as instrumental in their choice of specialty. In contrast to the 1985 study, men favored physician autonomy more than women as a factor in their specialty choice and the value of family life to men increased. The men estimated their future income to average \$193,000/year (in 2004 dollars) while the females estimated an average of \$162,000/year. Females continued to prefer primary care, patient contact and predicted lower salaries, while males continued to prefer surgery and predicted a higher salary than women. Aside from some small, but potentially important, differences the overall specialty preference of medical students and traditional preferences of men and women are comparable to those indicated by students entering medical school 20 years ago.</p>	
Support	Crile Fellowship
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Preliminary Investigation of the MRI Properties of Thermoreversible Pluronic Triblock Copolymers and their Potential Role in RF Ablation Enhancement
Student Presenter	Sonali Mehandru
Co-Workers and Collaborators	
Advisor	Agata Exner PhD & Claudia Hillenbrand PhD
Departments	Department of Radiology
Institutions	University Hospitals Case Western Reserve University
Body of Abstract (300 words or less)	
<p>The Pluronic triblock copolymers are a unique class of molecules whose amphipathic nature favors their potential as chemotherapeutic drug delivery vehicles. In particular, their ability to form thermoreversible gels at body temperature provides an in vivo localized source of targeted drug delivery which, together with saline enhancement, promises to improve RF tumor ablation therapy. The purpose of this study has been to evaluate the magnetic resonance (MR) imaging properties of these polymers, specifically, to investigate whether there exists a change in their MR properties as a function of temperature that can be visualized by T1-weighted imaging and can be later used in RF ablation for real-time monitoring of the ablation process.</p> <p>Varying concentrations of the polymer in both distilled water and saline were formed using a weight/weight concentration method. MR images of these polymer solutions were acquired using a T1-weighted Spin Echo sequence performed on a clinical 1.5 Tesla MR scanner. The sequence was repeated across a range of solution temperatures inclusive of the sol-gel transition temperature. A pixel-by-pixel analysis of the images was done using a best-fit MR signal recovery equation curve, generating optimized parameter values for T1.</p> <p>Our preliminary results demonstrate a significant difference in T1 times between different Pluronic polymers and across different temperatures. In particular, the liquid and gel phases exhibit marked differences in T1 times. These changes were also easily visible upon optical inspection of the MR images. Future work will attempt to specifically investigate the sol-gel transition using MR properties and characterize the visible contrast change between phases. Of particular interest is the application of these thermoreversible gels in real-time evaluation of ablation zone extent based on contrast changes in T1-weighted real-time MR images -- an important noninvasive measure of therapeutic success.</p>	
Support	This project was supported by a pilot research grant from the American Cancer Society, Ohio Chapter
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Electrical Stimulation of the Subthalamic Nucleus: Model-Based Analysis of a 3D Reconstructed Neuron to Intracellular and Extracellular Stimulation
Student Presenter	Svjetlana Miocinovic
Co-Workers and Collaborators	Martin Parent, André Parent
Advisor	Cameron C. McIntyre
Departments	Biomedical Engineering; Biomedical Engineering; Laboratoire de Neurobiologie
Institutions	Case Western Reserve University; Cleveland Clinic Foundation; Centre de recherche Université Laval Robert-Giffard
Body of Abstract (300 words or less)	
<p>The subthalamic nucleus (STN) represents the major target for deep brain stimulation (DBS) in the treatment of Parkinson's disease. However understanding of the response of STN neurons and surrounding pallidothalamic fibers to electrical stimulation is limited. Therefore, we developed a systems level computer model of STN DBS focused around the experimental model addressing STN DBS in the parkinsonian macaque monkey. The STN neuron model includes detailed representations of the soma, dendrites and axonal processes with a 3D geometry derived from biotin dextran amine labeled STN neurons of a cynomolgus monkey. The model membrane dynamics consist of known Na⁺, K⁺, and Ca²⁺ ion channels. A 3D monkey brain atlas was created and 50 STN neurons and 50 pallidothalamic (GPi) fibers were positioned within the atlas. Neurons were stimulated with a bipolar DBS stimulus (136Hz; 0.09ms pulse width; 2 or 3V amplitude) which has previously been tested for clinical efficacy in a parkinsonian monkey. During intracellular stimulation, firing frequency increased with the increasing current injection and there was a transient increase followed by a decrease in the firing rate. The model also exhibited post-stimulus slow afterhyperpolarization with delayed resumption of spontaneous firing that was dependent on the stimulation amplitude and duration. During extracellular DBS stimulation clinically ineffective 2V stimulus activated 3% of STN neurons and 52% of GPi fibers, whereas clinically effective 3V stimulus activated 28% of STN neurons and 62% of GPi fibers. The model developed accurately represents STN neuron as demonstrated by a close match between theoretical and experimental results for intracellular stimulation. The results suggest that both STN neurons and GPi fibers of passage are activated with typical STN DBS parameter settings. Clinically effective stimulus applied in the theoretical model of STN DBS activated ~10X more STN neurons, but only 1.2X more GPi fibers than the clinically ineffective stimulus.</p>	
Support	NIH (T32 GM07250), IRSC (MOP-5781), Ohio BRTT/WCI Partnership and the Cleveland Clinic Foundation
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	The Relationship of Religiosity to Depression and Perceived Stress in Caregivers of Persons with Alzheimer's Disease
Student Presenter	Virginia Miraldi
Co-Workers and Collaborators	Marcie Lambrix
Advisor	Kathleen Smyth
Departments	University Memory and Aging Center
Institutions	Case Western Reserve University and University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Caregivers of persons with Alzheimer’s disease (AD) are at increased risk for depression and other forms of morbidity and mortality as compared to age-matched controls due to the stresses associated with caregiving. In this study, we evaluated whether certain aspects of religiosity were associated with the level of depressive symptomatology and perceived stress among caregivers. Subjects were primary caregivers of persons with a diagnosis of probable or possible AD who provide care for their relative in a home environment (either their own private home or the Care recipient’s place of residence). Religiosity was assessed through four questions answered by participants regarding organizational (formal), non-organization (informal), and subjective religious behaviors and then scaled into a composite score based on factor analyses. Caregiver perceived stress was measured using the caregiver Overload scale, while depression was assessed by the Center for Epidemiological Studies-Depression scale (CES-D). We controlled for caregiver income, education, gender, health status, and race and care recipient cognitive, functional, and behavioral impairment. Linear regression analysis with caregiver overload as the dependent variable revealed that the coefficient for the scaled religious variable approached significance ($p < .088$). The negative coefficient indicated that higher religiosity reduced caregiver overload. Analysis of each of the four religiosity variables independently, showed that those who found comfort from religion during times of stress were significantly ($p < .05$) less likely to experience overload. Logistic regression using the CES-D as a dichotomous variable and including overload as a predictor along with previously used control variables revealed that overload increased the odds of depression while attendance at religious services reduced the odds of depression ($p < .025$). We concluded that specific aspects of religiosity can decrease the stress and depression associated with caregiving.</p>	
Support	The Caregiving Core of The University Memory and Aging Center is a federally funded Alzheimer’s Disease Research Center (ADRC).
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Hybrid Total Knee Arthroplasty Revisited: Clinical Outcomes at Ten Years Post-Op
Student Presenter	David Ott
Co-Workers and Collaborators	Patty Conroy-Smith, RN
Advisor	Matthew Kraay, MD
Departments	Department of Orthopedics
Institutions	University Hospitals
Body of Abstract (300 words or less)	
<p>In selected patients, total knee arthroplasty (TKA) has been shown to be an effective treatment for painful and disabling arthritis of the knee. Improvements in components, surgical technique, and fixation methods have resulted in good to excellent results in greater than 90% of primary TKAs. Concerns exist, however, with the patellofemoral joint and late loosening of cemented components. The tibial component loosening has been particularly troublesome. To improve these outcomes, the “Hybrid” technique for implant fixation in TKA has experienced widespread clinical use. But clinical and radiographic outcomes with this method have been scarce. Between 1988 and 1993, 100 consecutive “hybrid” posterior cruciate retaining TKA, in 81 patients, were performed. In 1996, fluoroscopically guided tangential radiographs of the tibial, femoral, and patellar components were performed to evaluate the bone-implant and bone-cement interfaces. The results of this 3-8 year follow-up showed that post-operative knee pain and function were improved over the pre-op condition. There have been few long-term studies of the “hybrid” technique. This study will review the results of these TKAs after a minimum follow-up of 10 years.</p>	
Support	Crile
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	LprA is a Mycobacterium tuberculosis lipoprotein that functions as a TLR-2 ligand and modulates both acute-phase stimulatory and chronic-phase inhibitory immune events
Student Presenter	Nicole Pecora
Co-Workers and Collaborators	Adam Gehring, W.Henry Boom
Advisor	Clifford V. Harding
Departments	Pathology, Infectious Disease
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Bacterial triacylated lipoproteins are known to signal through toll-like receptor 2 (TLR2). LprA is a cell wall-associated lipoprotein with no homologues outside the slow-growing mycobacteria. In this study, we cloned lprA from Mycobacterium tuberculosis H37Rv and expressed it in Mycobacterium smegmatis as a 6xHis-tagged construct. LprA-6xHis was able to induce IL-8 production from HEK 293 cells in a TLR2-dependent fashion. Furthermore, LprA-6xHis stimulated the production of both TNF-α and IL-10 from C57BL/6J wild-type but not TLR2 -/- murine bone marrow-derived macrophages (Mϕs) by 6 hours of exposure. Conversely, LprA-6xHis inhibited IFN-γ-induced MHC-II antigen processing in murine Mϕs after 48 hours of exposure. These effects were dependent on the acylation state of the protein, i.e., full-length, non-acylated LprA-6xHis was much less potent at cytokine induction than the acylated form. These studies identify a novel mycobacterial TLR2 ligand and demonstrate its ability to induce both activating and inhibitory immune responses.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	CT Evaluation of the Reoperative Cardiac Surgery Patient
Student Presenter	Nick Pesa
Co-Workers and Collaborators	
Advisor	Dr. Richard Gilkeson
Departments	Radiology
Institutions	University Hospitals
Body of Abstract (300 words or less)	
<p>As our population ages and surgical techniques improve, older patients often find themselves undergoing multiple cardiac surgeries. In the surgical planning of these re-operative patients it is important for the radiologist to ascertain a detailed thoracic image that allows characterization of the heart and its surrounding structures. Recent advances in the resolution and clarity of cardiac imaging using MRI and CT have made this possible. My objective was to look at whether or not obtaining these detailed CT images changes the surgical planning and if so, what features the scan reveals are important for the radiologist to emphasize and therefore important for the cardiac surgeon to know about. A review of Dr. Alan Markowitz's (a cardiac surgeon) patient files was conducted, looking for re-operative patients in the past 4 years. After these patients were identified and both their radiology reports and operating notes were examined, a review of the files was conducted with both Dr. Robert Gilkeson (a radiologist) and Dr. Markowitz. A rating system of how the radiological findings changed the surgical plan was devised and applied to each case.</p> <p>Unfortunately the study was not complete enough to yield results, however from preliminary examination of the data some important details can be teased out. So far it can be shown that in more than half of the cases the imaging findings changed the surgical plan significantly. What is also becoming apparent as the study progresses is what specifically the CT can show, and what the radiologist should be looking for.</p>	
Support	Not available at this time.
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Generation of a Protocol and Data Collection Sheet to Determine the Efficacy of Atrial Ablation Procedures in the Treatment and Control of Atrial Arrhythmias
Student Presenter	Kyle Pfahl
Co-Workers and Collaborators	
Advisor	Dr. Robert Stewart
Departments	Cardiothoracic Surgery (UHHS)
Institutions	UHHS
Body of Abstract (300 words or less)	
<p>The generation of a comprehensive data collection sheet prior to initiation of clinical research is imperative. This research project was completed in order to develop parameters and guidelines to create a data collection sheet that can be utilized in a retrospective study to determine the post-operative effects on variations of the left atrial ablation procedures. The data sheet created in this study was designed in such a way that it can easily be used to generate statistical data to analyze the efficacy, complications, and co-morbidities of each surgical technique.</p> <p>In this study, guidelines were developed to gather pre-operative patient data from previous medical charts and records. Pre-operative data is separated into subdivisions including demographics, cardiovascular hemodynamics, classification of cardiovascular disease, serum levels of cardiovascular enzymes, and preoperative medications.</p> <p>Intra-operative parameters and complications were also included in the data collection sheet.</p> <p>Post-operative measurements included medications and major catastrophes will be obtained from the patient charts. Data relating to the outcome of the atrial ablation procedure, including cardiac function, cardiac complications, and the re-development of atrial fibrillation, are included. A figure of the left atrium was included to describe the different surgical procedures so they can be examined, categorized, and compared. Finally, the data collection sheet contains a section for more recent information regarding cardiovascular health that will be obtained by speaking individually with the patients in the study.</p> <p>This data sheet was generated in this research project in order to properly analyze the pre-operative data, intra-operative data, and the post-operative data of atrial ablation surgeries so that any important results can be easily noted, reviewed, and interpreted. This data sheet will make it easy to compare the different surgical atrial ablation techniques in order to determine their efficacy in the long term treatment of atrial arrhythmias.</p>	
Support	N/A
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Local control of murine sublottis development
Student Presenter	Valerie Pires
Co-Workers and Collaborators	
Advisor	Leila A. Mankarious, Md
Departments	Otolaryngology
Institutions	Massachusetts Eye and Ear Infirmary
Body of Abstract (300 words or less)	
<p>Objective: To determine if subglottic development is at least partially under local control and to determine which tissue layer(s) is predominantly responsible.</p> <p>Design: The suglottises of 12 Day 4 CD1 mice were grown in whole organ culture. The 12 subglottises were divided into 3 individual groups: A, B, and C. Group A had all tissue layers of the subglottis intact: luminal epithelium, cricoid cartilage, inner and outer perichondrium. Group B had all layers intact with the exception of luminal epithelium and Group C had all layers removed (luminal epithelium, inner and outer perichondrium) resulting in cricoid cartilage-only rings grown in culture. All rings were grown in basic medium without the use of growth factors or serum for 15 days. Measurements of the rings were taken before and after organ culture growth.</p> <p>Results: Group A was the only group that experienced growth. Only luminal growth was statistically significant although all rings experienced growth in both the luminal and external diameter. Group B did not experience any growth. Group C lost structural integrity with collapse of the ring and no growth of any dimension of the cartilage.</p> <p>Conclusions: Growth of the subglottis is under local control but may have additional influences from the outside that were not investigated here. Removal of just the epithelium stunts growth of the entire ring (luminal and outer diameter). Removal of all tissue layers around the cricoid cartilage results in a structural collapse of the ring suggesting that the cartilage in this age group is dependant on surrounding tissues for structural integrity.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Diagnostic and medication issues in the differential diagnosis of autistic disorders and attention deficit/hyperactivity disorder
Student Presenter	Aleksandra Rachitskaya
Co-Workers and Collaborators	
Advisor	Michelle Rone-DePolo, Psy.D
Departments	The Cleveland Clinic Center for Autism
Institutions	The Cleveland Clinic Center for Autism Case School of Medicine
Body of Abstract (300 words or less)	
<p>Previous studies in the field of autism and Attention Deficit Hyperactivity Disorder (ADHD) have not produced conclusive results on the relationship between the two. The objective of this study was to examine the trend of misdiagnosing autism spectrum children with ADHD and the response of these patients to commonly prescribed ADHD medications.</p> <p>A retrospective chart review was conducted on 201 children referred to the Cleveland Clinic Center for Autism for the assessment of possible autistic spectrum disorders between January 2002 and June 2004. The frequency of misdiagnosing children who meet symptom criteria for autistic spectrum disorder with ADHD was reviewed, and when applicable, the patient's response to commonly prescribed ADHD medications.</p> <p>Of 201 patients, 26 (12.94%) had a prior diagnosis of ADHD. In 19 children (73.08%) ADHD was not confirmed, with symptoms accounted for by autistic spectrum disorder. Six children (23.08%) received a dual diagnosis of autistic spectrum disorder and ADHD. In one child, a diagnosis of ADHD alone was confirmed. Out of 26 patients with prior diagnosis of ADHD, 24 were prescribed one or more ADHD medications (e.g. methylphenidate, dextroamphetamine, etc.), totaling 33 medications prescribed. Medication efficacy (per parent report) was not demonstrated in 57.57% of the prescribed drugs.</p> <p>Findings indicate that there may be a tendency to misdiagnose patients presenting with symptoms of "high-functioning" autism or Asperger's disorder as having ADHD. When such misdiagnoses occur, a patients' awareness of and access to appropriate treatment may be delayed, and often prescription practices are not efficacious.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Lubricin inhibits synovial cell overgrowth
Student Presenter	David K. Rhee
Co-Workers and Collaborators	
Advisor	Matt Warman
Departments	Departments of Genetics and Center for Human Genetics
Institutions	Case Western Reserve University School of Medicine and University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Lubricin is a large (~225 kDa) secreted proteoglycan that functions as the major lubricant in articulating joints. Mutations in the gene encoding lubricin (PRG4) cause the rare autosomal recessive disease, camptodactyly-arthropathy-coxa vara-pericarditis syndrome (CACP) that has precocious joint failure as a major feature. CACP is characterized by a severe arthropathy (joint swelling, pain, and stiffness) that is accompanied by a non-inflammatory synoviocyte hyperplasia. Some of the phenotypic characteristics observed in CACP, specifically synovial cell hyperplasia, is also a major pathological feature in common diseases of the joint such as rheumatoid arthritis and osteoarthritis. Consequently, studying the biology of lubricin may yield important insights into the pathogenesis of more common joint diseases. In order to elucidate the function of lubricin in articulating joints, mutant mice were created that lack lubricin. These mice recapitulate many of the phenotypes seen in CACP including camptodactyly, arthropathy, and synoviocyte hyperplasia. In order to delineate the mechanism responsible for regulating the synoviocyte hyperplasia seen in CACP, lubricin-null mouse synoviocytes were examined both in vivo and in vitro. Lubricin-null mice had increased PCNA (Proliferating Cell Nuclear Antigen) staining within their synovium compared to heterozygous controls, suggesting that lubricin directly or indirectly regulates the proliferation of these cells. In order to determine the mechanism by which lubricin regulates synovial cell growth, lubricin-null synoviocytes were cultured in vitro. Lubricin-null synoviocytes proliferated rapidly in culture and could be passaged numerous times in contrast to wild type mouse synoviocytes. Both purified human lubricin and recombinant mouse lubricin were able to inhibit the adhesion dependant growth of these cells. This growth inhibitory property was dependant on the tertiary or quaternary structure of the protein. Therefore it appears that in addition to its lubricating properties, lubricin also protects articular cartilage surfaces from protein deposition, cell adhesion, and serves as crucial regulator of cell growth.</p>	
Support	NIH grants GM07250, HD07518, and GM08613
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Characteristics and perceptions of health care professionals that may influence end-of-life decisions in long term care
Student Presenter	Benjamin J. Ricke
Co-Workers and Collaborators	Robert M. Palmer
Advisor	Barbara J. Messinger-Rapport
Departments	Department of Internal Medicine Section of Geriatric Medicine
Institutions	Cleveland Clinic Foundation
Body of Abstract (300 words or less)	
<p>PURPOSE: Determine characteristics and perceptions of health care professionals (HCP) at an urban nursing home that may influence end-of-life (EOL) discussions.</p> <p>DESIGN: Semi-structured interviews.</p> <p>METHOD: Identify and interview all HCP who discuss resuscitation with patients. Interviews were individual and private.</p> <p>RESULTS: Six themes were extracted from transcribed audiotapes of 13 interviews. Strongest themes in descending order:</p> <ol style="list-style-type: none"> 1) Nature of illness: a patient's poor prognosis, quality of life, debility, diagnosis and cognitive ability lead HCP to favor DNAR. 2) Experience: HCP perceived EOL discussions were enhanced by patient education and/or experience with EOL choices. Serial sessions with patients and families, rather than one encounter, were perceived to best foster patient understanding of EOL choices. Many HCP's felt personal experiences (e.g. counseling own family) and professional experiences (clinical practice, education) improved ability to conduct EOL discussions. 3) Ethnicity: African American patients were viewed as more likely to desire aggressive EOL treatment. Some African-American HCP perceived their ethnicity facilitated EOL discussions. 4) Age: Most HCP favored Do Not Attempt Resuscitation (DNAR) with advanced age. Older age of a HCP was perceived as facilitating EOL discussions. 5) Family involvement: Some HCP believed family involvement enhances EOL discussion even with a cognitively intact patient. Others felt family dynamics impede EOL discussions. 6) Culture: Patient and HCP religion, views of death, place of origin, and place of residence might impede or facilitate EOL discussions, depending upon the situation. <p>CONCLUSIONS: Ethnicity and ethnic differences may play a significant role in many EOL discussions; our findings confirm the need for continuing multicultural professional training. The strong theme of "experience" as facilitating EOL discussions lends strength to efforts to enhance both professional and patient education regarding advance directives. Observations of the DNAR process itself might clarify whether identified characteristics and perceptions actually influence DNAR designation in the LTC setting.</p>	
Support	Crile Fellowship
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Formulation of (V/K) Kinetic Isotope Effects for Un-Branched Catalytic Cycles Containing Multiple Isotopically Sensitive Steps
Student Presenter	Mark W. Ruszczycky
Co-Workers and Collaborators	
Advisor	Vernon E. Anderson
Departments	Biochemistry
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Catalytic cycles containing only one isotopically sensitive step possess observed (V/K) kinetic isotope effects that can be written in terms of forward and reverse commitments to catalysis. These commitments provide a natural and intuitive way of interpreting the observed isotope effects. Unfortunately, when multiple isotopically sensitive steps are present in the mechanism, the observed (V/K) kinetic isotope effect can only be written in terms of complex expressions of the intrinsic rate constants for each step, the interpretation of which is not immediately obvious. Recent experimental and theoretical studies have shown that each step in a kinase reaction could have significant secondary deuterium isotope effects. We show here that (V/K) kinetic isotope effects from un-branched catalytic cycles containing multiple isotopically sensitive steps can be written as a weighted average of the intrinsic contributions from each step, where the weighting factors are simply the reciprocal sum of the forward and reverse commitments for each step plus unity, $1/(C_{fi} + C_{ri} + 1)$. This expression will aid in interpreting our experimentally determined isotope effects on phosphofructokinase and serine transacetylase.</p>	
Support	NIH NSF MSTP
Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Endonuclease Activity in Multiple Myeloma
Student Presenter	Sima Shah
Co-Workers and Collaborators	
Advisor	Dr. Nikhil C. Munshi
Departments	Department of Medical Oncology The Jerome Lipper Multiple Myeloma Center
Institutions	Dana-Farber Cancer Institute Harvard Medical School
Body of Abstract (300 words or less)	
<p>Multiple myeloma (MM) is associated with significant genomic instability. Endonuclease activity is integral in mediating these genetic alterations that lead to homologous recombination and chromosomal abnormalities. The purpose of this study was to assess endonuclease activity in six different MM cell lines using a plasmid based assay. The assay observed the degradation of a supercoiled plasmid on a gel electrophoresis following incubation with MM cell extracts as an indicator of endonuclease activity. This assay confirmed significantly elevated endonuclease activity in all six of the MM cell lines compared to normal plasma cells. After 5 minutes of incubation, the supercoiled plasmid was significantly cleaved into linear fragments in the MM cell lines. To visualize plasmid decay on electrophoresis, a time course analysis was performed on all six cell lines and a control plasma cell line at varying incubation times with the supercoiled plasmid. The MM cell lines demonstrated plasmid degradation at 2 minutes which continued until total loss of supercoiled structure at 10 minutes. In contrast, the control plasma cells showed no plasmid degradation after 2 minutes and maintained supercoiled structure for 10 minutes. As determined by this plasmid based assay, endonuclease activity is markedly increased in the MM cell lines and may be a key initiator resulting in the genetic instability seen in MM. The increase in endonuclease activity may directly contribute to the acquisition of new mutations in MM cells and the subsequent clinical progression of the disease. Future directions of this study are to determine the efficacy of various endonuclease inhibitors in hopes of determining specific elevated endonuclease activity to target for possible therapeutic interventions.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Strategic Decision Support System for Heart Transplant Listing
Student Presenter	Brandi Sinkfield
Co-Workers and Collaborators	Manu Sharma, Indu Deglurkar, Joan Alster, Eugene Blackstone
Advisor	Eugene Blackstone
Departments	Departments of Thoracic and Cardiovascular Surgery and Quantitative Health Sciences, and The Kaufmann Center for Heart Failure
Institutions	The Cleveland Clinic Foundation
Body of Abstract (300 words or less)	
<p>Background: Cognitive limitations in integrating information over multiple domains have resulted in the development of scoring models that either risk-stratify or estimate absolute risk of acute outcomes of cardiac operations such as coronary artery bypass grafting (STS, EUROscore, Higgins score). However, no system has been created to estimate long-term tailored prognosis of individual heart failure patients which can aid in the complex and inexact process of deciding for or against listing for cardiac transplant.</p> <p>Hypothesis: Can a system be developed to predict accurately the prognosis of individual candidates for cardiac transplant at the time of listing? Can such a system integrate the vast amounts of information available to transplant teams to provide strategic support for management decisions necessary for listing?</p> <p>Methods: Demography, clinical status, medical history, cardiac and noncardiac comorbidity, physical examination, laboratory values, immunology (including cytotoxic and flow PRA), and follow-up data were collected for 988 adult patients undergoing heart transplant from August 1984 through December 2003 at the Cleveland Clinic Foundation. Multiphase non-proportional hazard modeling of mortality maximized prediction accuracy rather than explanatory modeling. This included aspects of computer-intensive generalizations of computer-aided regression trees (random forests) for time-related data and bootstrap techniques aimed at prognostic validity.</p> <p>Results: Extensive efforts have been completed in incorporating sources of electronic data, verifying these data, and filling in missing data. A combined statistical and algorithmic strategy for generating the prognostic model has been developed. An intranet-based computer program has been written and tested that will generate an individualized survival curve from the completed model. Based on individual patient characteristics, this curve can assist in the decision-making process for transplant listing.</p> <p>Conclusion: Although modeling is not complete at this time, we anticipate that providing accurate prognostic information from complex clinical data will improve physician's management decisions for heart transplant candidates.</p>	
Support	Support: Departments of Thoracic and Cardiovascular Surgery and Quantitative Health Sciences, and The Kaufmann Center for Heart Failure
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	A Needs Assessment of Diabetes Patients at the Free Medical Clinic of Greater Cleveland
Student Presenter	Jonah Stulberg
Co-Workers and Collaborators	Gail Bromley, Ione Freedman
Advisor	Susan Flocke, PhD
Departments	Epidemiology and Biostatistics, Family Medicine
Institutions	Case Western Reserve University, School of Medicine Free Medical Clinic of Greater Cleveland
Body of Abstract (300 words or less)	
<p>While nationally recognized diabetes self-management and education programs exist, they have demonstrated minimal success across varying demographic populations. There is increasing evidence to suggest that tailoring implementation of a new diabetes program specifically to the needs of the patient population achieves improved results. We developed a survey instrument to assess the educational, motivational and physical needs of diabetes patients at The Free Medical Clinic of Greater Cleveland. Based on patient preference, the survey was either read to patients or self-administered as they came in for their medical care visit. 78 patients completed the 69 question survey over a six week period. Patients were asked to answer questions about their health beliefs, willingness to change, perceived barriers to seeking care and an assessment of their current diabetes-specific knowledge. Key findings include, 28.2% of respondents report trying to follow a low-carbohydrate diet of any kind, while 78.2% report that eating habits are very important to their diabetes care. 69.9% of respondents report exercising fewer than four days a week, and 79.7% report that exercise is very important to their diabetes care. Patient and staff interviews were also conducted to supplement survey results. The majority of respondents appear to be in the contemplation or preparation stages of behavior change, and our findings suggest that a lack of education in the areas of diet and exercise prevents many of these patients from making positive health changes. The findings are being used to develop a program specific to the needs of this population.</p>	
Support	
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Persistent network activity triggered by brief synaptic inputs to the rat hippocampus
Student Presenter	Christa Swisher
Co-Workers and Collaborators	
Advisor	Ben Strowbridge
Departments	Department of Neurosciences
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>The hilar region of the dentate gyrus is one of the most severely affected brain regions in patients with idiopathic temporal lobe epilepsy. While a causal relationship between hilar cell loss and epileptogenesis has not been established in humans, repetitive perforant path stimulation in rats mimics this pattern of cell loss and readily induces epileptic seizures. We used acute rat brain slices to define the functional consequences of repetitive perforant path stimulation on neurons in the dentate gyrus and to determine whether hilar mossy cells are predisposed to damage following this treatment. We used whole-cell patch clamp recording to measure intracellular responses to perforant path (PP) stimulation. We observed two types of responses following high intensity PP stimulation: a short-latency disynaptic EPSP reported by other investigators and a long-lasting train of polysynaptic potentials. The short-latency response reflects activation of dentate granule cells by stimulated PP axons; granule cells innervate mossy cells resulting in a slightly delayed excitatory input. The late polysynaptic response has not been reported previously and may reflect reverberating synaptically-coupled networks within the dentate hilus. The polysynaptic response had a duration of a few seconds to over one minute. Several lines of evidence suggest that PP-evoked polysynaptic activity did not result from a transient increase in synaptic efficacy along the PP-granule cell-mossy cell pathway. First, polysynaptic activity was selectively abolished by low concentrations of glutamate receptor antagonists. Second, we observed both EPSPs and IPSPs during periods of polysynaptic activity. Finally polysynaptic responses could be evoked by a second PP test electrode following high intensity stimulation in a different PP segment. Therefore, it is likely that the polysynaptic response observed in a hilus cell after perforant path stimulation is due to increased network activity within the entire hilus region. This recurrent pathway within the hilus which mediates excitation in response to high-intensity stimulation of the perforant path may lower the threshold for epileptic discharges.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Comparison of Hair Growth Rate in Pre- versus Post-Menopausal Women
Student Presenter	Nilofar Syed
Co-Workers and Collaborators	Michelle Endicott
Advisor	Paradi Mirmirani
Departments	Dermatology
Institutions	University Hospitals of Cleveland
Body of Abstract (300 words or less)	
<p>Background: The interplay of hormonal signals responsible for the different stages of the hair cycle is still poorly understood. In menopause there are alterations in circulating hormonal levels which may therefore cause alterations in the hair cycle leading to clinical thinning or shedding. The objective of this study is to compare data on hair density and growth rates in pre- versus post-menopausal women to determine if menopause-related hormonal changes have an effect on hair growth and shedding.</p> <p>Methods: The study design is a cross-sectional cohort study comparing pre-menopausal to post-menopausal women with a sample size of 16 patients per group. Two 1 cm² areas of the scalp (frontal and occipital) were trimmed and an image was taken with a Digital Micrograph Imaging System (DMIS). The DMIS system is a hand-held probe which has been used successfully to measure hair growth rates and anagen/telogen ratios. Patients returned in 1-3 days to have a second set of images taken to determine growth rate. Subjects were also instructed to collect shed hair on 1 day/week for two weeks.</p> <p>Results: Preliminary results are only available. For pre-menopausal subjects, the average frontal growth rate was 0.293mm/day and average occipital growth rate was 0.305mm/day. For post-menopausal subjects, the average frontal growth rate was 0.235mm/day and average occipital growth rate was 0.276mm/day. For pre-menopausal subjects, the average frontal hair density was 181 hairs/cm² and the average occipital hair density was 153 hairs/cm². For post-menopausal subjects, the average frontal hair density was 151 hairs/cm² and the average occipital hair density was 120 hairs/cm².</p> <p>Conclusions: Preliminary results indicate that the average growth rates are higher for pre-menopausal women than post-menopausal women. The average frontal hair density was also higher than occipital hair density. These results will be further studied as 50 more subjects are anticipated to enroll in the study.</p>	
Support	Proctor and Gamble grant
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Evaluation of Predictors of Acute Renal Failure - A Retrospective Case-Controlled Study
Student Presenter	Bisher Tarabishy
Co-Workers and Collaborators	
Advisor	Ash Sehgal, M.D.; Paul Drawz, M.D.
Departments	Department of Medicine, University Hospitals
Institutions	University Hospitals of Cleveland, Metrohealth Hospitals
Body of Abstract (300 words or less)	
<p>Acute renal failure (ARF) is a major complication of hospitalization, occurring in approximately 5 to 7 percent of hospitalized patients. Despite modern treatment, the mortality rate among these patients may be as high as 19 percent of all hospitalized patients and 58 percent among ICU patients who develop ARF. Many studies have revealed the most likely causes of ARF to be volume depletion, aminoglycoside use, radiographic contrast, surgery, and sepsis. Other studies have evaluated factors that affect the mortality associated with ARF. Interestingly, the patient characteristics and prognostic variables that may predispose to ARF have not been as thoroughly investigated.</p> <p>We propose to evaluate patient characteristics and laboratory values available on admission that may help predict ARF in hospitalized patients. Serum creatinine values for patients admitted to the medical, surgical, and obstetric services at University Hospitals in the last three months of 2003 will be reviewed to find cases of ARF. Patients with ARF will be identified by an increase in their serum creatinine. For each case, two controls will be identified. Controls will be chosen from those patients whose serum creatinine did not rise, during their hospitalization.</p> <p>The hospital charts of the case and control subjects will be reviewed to identify demographic data, past medical history, admission and discharge diagnoses, admission blood pressure and heart rate, admission medications, medications administered while in the hospital, whether radiocontrast material was administered, electrolyte levels, as well as urinalyses.</p> <p>Examining admission characteristics of cases of ARF and controls is likely to reveal predictive variables. These variables could then be used in an intervention study aimed at improving outcomes for these high risk patients. Although ARF is not a common complication of hospitalization, it is important to prevent because it is associated with a high mortality rate.</p>	
Support	
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	An Investigation of the University of Pennsylvania Shoulder Score: The Effect of Comorbidities on Patient-Reported Outcomes
Student Presenter	T.J. Tausch
Co-Workers and Collaborators	Michael Codsi
Advisor	Joseph Iannotti
Departments	Orthopaedic Surgery
Institutions	The Cleveland Clinic Foundation
Body of Abstract (300 words or less)	
<p>Background: In validating the efficacy of orthopaedic procedures, outcomes reporting must supercede simple morbidity and mortality data and take into account the improvements in the patients' qualities of life. This is generally accomplished via the use of outcomes reporting tools, such as the Short-Form 36 (SF36) and the University of Pennsylvania (PENN) shoulder scores, as examined in this study. Difficulties arise, however, when using patient-reported measures, due to a multitude of factors introduced when relying on a variably heterogeneous patient population. The goals of the present retrospective study include 1) elucidating the effects of comorbidities on the patient-reported outcomes using the PENN and SF36 shoulder scores, 2) determining the sensitivity of the various components of the PENN score, and 3) correlating various demographic and clinical features with any particular reported outcome.</p> <p>Methods: Because of the reporting problems encountered due to population heterogeneity, the patient population for this particular study was selected to be as homogenous as possible, with a total of 70 patients (and 78 shoulders) who were clinically and radiographically diagnosed solely with primary osteoarthritis of the shoulder (glenohumeral joint) and who underwent an initial Total Shoulder Arthroplasty (TSA) performed by one of two orthopaedic surgeons in the same practice. Patients' completed questionnaires were pulled from a database, and included patients who met the inclusion criteria and who had a minimum of one-year follow-up, yielding pre-operative and post-operative PENN and SF36 scores.</p> <p>Results: Pending</p> <p>Conclusions: Pending</p>	
Support	This project was supported by the shoulder fund, Dept of Orthopaedics, Cleveland Clinic Foundation
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	A Novel Boronic Acid Based Transition State Inhibitor of Class A Beta-Lactamases
Student Presenter	Jodi M Thomson
Co-Workers and Collaborators	Fabio Prati, Christopher R. Bethel, Andrea M. Hujer, Marion S. Helfand, and Robert A. Bonomo
Advisor	Robert A. Bonomo
Departments	Department of Pharmacology, CWRU, Research Service, Louis Stokes Cleveland Department of Veterans Affairs Medical Center, and The Department of Chemistry, University of Modena, Modena, Italy
Institutions	Case School of Medicine, Louis Stokes Cleveland Department of Veteran Affairs Medical Center
Body of Abstract (300 words or less)	
<p>Drug resistance to beta-lactam antibiotics in gram negative bacteria is largely mediated by the drug-hydrolyzing enzyme, beta-lactamase. To maintain the effectiveness of these key front-line antimicrobial agents, new beta-lactamase inhibitors are being designed. In this study, we tested a novel transition-state analog that contains the R1 side-chain of cefotaxime, a third generation cephalosporin, attached to boric acid. To assess affinity, we determined the dissociation constant of the inhibitor by competition with the chromogenic substrate, nitrocefin. The binding affinity of the inhibitor to various Class A beta-lactamase enzymes with differing substrate specificities was determined, allowing some inference into the key protein-inhibitor binding residues. In general, we observed dissociation constants in the low micromolar range. We found that amino acid substitutions in SHV beta-lactamase that widen the binding pocket increased the affinity for the complex R1 side chain of the transition state inhibitor. In addition, a key substitution at D104K that places a positive charge at the entrance of the binding pocket also increased inhibitor affinity. Structural studies of SHV-1 bound to the inhibitor are underway. These will further increase our understanding of key R1 side chain interactions and may allow for the production of higher affinity binding inhibitors for future clinical use.</p>	
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Do you have previous research experience?	Yes
Please choose your academic program:	MD, PhD

Title	Binding of MD-2 and TLR-4 to Endotoxin Adherent to Titanium Particles
Student Presenter	Christopher J. Utz
Co-Workers and Collaborators	Andrew S. Islam, Michelle A. Beidelschies, and Edward M. Greenfield
Advisor	Edward M. Greenfield
Departments	Department of Orthopaedics
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Aseptic loosening of orthopaedic implants is a major problem facing clinical orthopaedists. Loosening is caused by wear particles from the implant, which then stimulate increased osteoclast differentiation and subsequent osteolysis. This process is stimulated by adherent endotoxin on the wear particles and mediated by a number of cytokines. One possible mechanism is that the endotoxin binds to Toll-like receptors (TLRs), initiating a signaling cascade resulting in the release of inflammatory cytokines. In support of this, an inactivating mutation in TLR4, the signal transducer for lipopolysaccharide (LPS) in mammals, substantially reduces biological activity of the particles. However, it is unknown whether the particles activate TLR4 or whether basal TLR4 activity is sufficient. Since TLR4 requires the presence of MD-2 to effectively recognize and bind to LPS, we are investigating if endotoxin adherent to titanium particles will bind to MD-2 and TLR4, which could then initiate the subsequent signaling cascade. To examine the binding of MD-2, we modified for use with Titanium particles a LPS pull-down assay developed by Golenbock and colleagues. Titanium particles with adherent endotoxin were incubated with histidine tagged recombinant human MD-2. Titanium particles were then separated by centrifugation, washed four times, and western blotted using anti-polyhistidine antibodies to detect MD-2. Currently we have shown that MD-2 will bind to Titanium particles. Additionally, more MD-2 appears to bind to Titanium particles with adherent endotoxin than to particles without endotoxin, although this only occurs within a narrow range of titanium concentrations. Future steps will include using additional controls to determine whether MD-2 binding is specific and to determine the effects of LBP and CD14 (two additional proteins associated with the LPS receptor complex) on MD-2 binding. Finally, TLR4 fusion proteins will be used to assess the binding of TLR4 to the MD-2 / particle complex.</p>	
Support	Crile Fellowship to C.U. NIH ROI AR043769 to E.G.
Do you have previous research experience?	No
Please choose your academic program:	MD only

Title	Stem and Neural Precursor Cell Markers In The Adult Mouse Cochlea
Student Presenter	Michael Yerukhimovich
Co-Workers and Collaborators	
Advisor	Kumar Alagramam
Departments	Department of Otolaryngology – Head and Neck Surgery
Institutions	Case Western Reserve University
Body of Abstract (300 words or less)	
<p>Background: Hair cells are the lynch pin of the auditory system. Noise, ototoxic drugs or genetic factors can cause hearing loss in humans due to death of sensory cells (hair cells) in the cochlea and this hearing loss is permanent because damaged hair cells are not replaced. Identification of stem cells and/or hair cell precursors (similar to neural precursor) from the adult mouse cochlea, and by extension in humans, could be the first step leading to new therapeutic approaches to regenerate hair cells in deaf patients. It has been reported by other investigators that mouse utricle show limited potential to regenerate hair cells after injury and in vitro studies show that adult mouse utricle may harbor stem cells and hair cell precursor cells. These reports suggest that stem cells may be present in adult organ of Corti. We hypothesize that some progenitors of hair cells persist in the adult cochlea, and that they are simply deficient in some way and so are unable to contribute to regeneration. If stem and/or neural precursor cells persists in the cochlea, we should be able to detect the expression of genes associated with these cell types. Aim: To determine a possible set of neural precursor and stem cell markers expressed in the adult mouse cochlea. Methods: RNA from an adult mouse cochlea was used to probe a focused mouse cDNA array designed to explore neural stem cell development. The array contains 258 known genes that encode markers expressed by stem cells and neural precursor cells at various stages of differentiation. Results: 33 out of 258 genes tested on the array are expressed in adult mouse cochlea. Conclusions: No single marker is necessarily unique to stem cells, but their combination indicates that stem cells and/or progenitor cells may be present in the adult mouse cochlea. Further work is underway to test this assumption.</p>	
Support	None to declare
Do you have previous research experience?	Yes
Please choose your academic program:	MD only

Title	Temperature Controlled Radiofrequency Treatment of Tonsillar Hypertrophy for Reduction of Upper Airway Obstruction in Pediatric Patients
Student Presenter	Romy D. Yun
Co-Workers and Collaborators	
Advisor	James M. Coticchia M.D.
Departments	Dept of Otolaryngology-Head and Neck Surgery
Institutions	--Department of Otolaryngology-Head and Neck Surgery Wayne State University School of Medicine --Department of Otolaryngology-Head and Neck Surgery Case Western Reserve University School of Medicine --Division of Otolaryngology Childrens Hospital Los Angeles Department of Otolaryngology Keck School of Medicine of the University of Southern California
Body of Abstract (300 words or less)	
<p>Objective: To determine if temperature controlled radiofrequency (TCRF) tonsil reduction and adenoidectomy are not statistically different in outcome and to compare morbidity between conventional tonsillectomy and adenoidectomy (T&A)</p> <p>Design: Randomized control trial</p> <p>Setting: Tertiary Care Children's Hospital</p> <p>Participants: 23 patients, age 2.6-12.5 years with symptoms of OSA, hypertrophic tonsils with no other areas of upper airway obstruction with the exception of hypertrophic adenoids and a body weight of less than 150% were included in this study. All potential candidates underwent overnight polysomnography performed at the hospital. Exclusion criteria included body weight of more than 150%, personal history of prior surgery for upper airway obstruction active respiratory infection of chronic lung disease, Down Syndrome, speech, swallowing or neurological disorders, craniofacial abnormalities, and other co-morbidities (such as cor pulmonale).</p> <p>Intervention: TCRF tonsil reduction (12.6 ablations per patient (SD=1.50) and an average of 994.68 joules (SD=91.88) per insertion) adenoidectomy or traditional bovie T&A.</p> <p>Outcome Measures: Respiratory Distress Index (RDI) and total volume reduction as primary outcomes and secondary outcomes include post-op pain, daytime sleepiness, speech and swallowing problems, weight and diet, narcotic usage and the analog snoring scale.</p> <p>Results: TCRF patient's tonsil grade: baseline 3.0; 4 weeks post-treatment: 1.3, a volume reduction of 57%; post-op bleeding 0%. Pain measures on post-operative day (POD) 1: TCRF patients, no pain 15%, mild 77%, moderate 8%, severe 0%; for tonsillectomy patients, no pain 0%, mild 50%, moderate 40%, and severe 10%. Dysphagia measures at POD 1: TCRF patients: no dysphasia 69% versus 20 % for tonsillectomy patients. Return to normal diet by POD3: TCRF 41%, tonsillectomy 0%. Use of narcotic analgesic at POD2: TCRF patients 42% versus 87% of tonsillectomy patients.</p> <p>Mean visual analog snore scores (0-10 cm) four weeks post-op were less than one for both groups.</p> <p>Conclusions: TCRF tonsil reduction patients had similar RDIs. In addition there was decreased pain, similar analog snoring scales, and no evidence of bleeding.</p>	
Support	Crile Fellowship
Do you have previous research experience?	Yes
Please choose your academic program:	MD only