Advancing Research and Scholarship at Boston College

Thursday, December 11, 2014
10:30 a.m.–6:00 p.m.
Murray Function Room, Yawkey Center
Boston College
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Welcome to “Advancing Research and Scholarship at Boston College—Global Public Health: Policy, Disparity, Disease.” It is the first of a series of annual symposia that will showcase faculty and student research at Boston College and honor the work of a distinguished alumnus each year.

Research is one of the ways in which the University fulfills its mission to unite high academic achievement with service to others. We chose global public health as our inaugural theme because of its emphasis on equity in health and health care services worldwide. Faculty and students across Boston College—from the College of Arts and Sciences, Law School, and Lynch School of Education to the Connell School of Nursing and the School of Social Work—are also engaged in a range of public health issues such as improving access to health care, controlling infectious disease, and addressing the causes and consequences of violence and substance abuse.

The symposium opens at a morning poster session highlighting undergraduate and graduate student research in public health topics.

Our first alumni honoree, Philip J. Landrigan ’63, M.D., M.Sc., dean for global health, Ethel H. Wise Professor, and chair of preventive medicine at the Icahn School of Medicine at Mount Sinai, will then deliver a welcome and keynote. The director of the Children’s Environmental Health Center at The Mount Sinai Hospital in New York City, Dr. Landrigan is one of the world’s leading advocates of children’s health, and a principal investigator for the National Children’s Study, the largest study of children’s health ever launched in the United States.

Afternoon sessions will be dedicated to Boston College faculty research in public health policy, disparity, and disease.

Our hope is that by bringing together faculty, students, and alumni from multiple disciplines, we will spur discussion, encourage new thinking and engagement, and catalyze research that addresses urgent global public health concerns.

—Dr. Thomas C. Chiles
Professor, DeLuca Chair in Biology
Vice Provost for Research and Academic Planning,
Office of the Provost and Dean of Faculties
EVENT SCHEDULE

10:30 AM STUDENT POSTER SESSION

12:30 PM WELCOME & KEYNOTE
Public Health and the University: An Exploration
Philip J. Landrigan ’63, M.D., M.Sc.
Dean for Global Health, Ethel H. Wise Professor, and Chair of Preventive Medicine, Icahn School of Medicine at Mount Sinai; Director, Children’s Environmental Health Center, The Mount Sinai Hospital

2:00 PM BREAK

2:15 PM SESSION I: POLICY
Moderator: Susan Gennaro, Dean and Professor, Connell School of Nursing

An Integrated and Interdisciplinary Approach to Evaluating the Impact of Workplace Policies on the Safety, Health, and Well-Being of Hospital Workers
Dean Hashimoto, Associate Professor, Law School
Erika Sabbath, Assistant Professor, School of Social Work

How Tobacco Control Policies Affect Maternal and Child Health
Summer Sherburne Hawkins, Assistant Professor, School of Social Work

Why Do I Teach HIV/AIDS and Ethics?
James Keenan, S.J., The Peter Canisius Chair, Director of the Jesuit Institute, and Director of the Gabelli Presidential Scholars Program

3:15 PM SESSION II: DISPARITY
Moderator: Usha Tummala-Narra, Associate Professor, Lynch School of Education

Childhood Health Disparities Driven by Housing and Neighborhood Contexts
Rebekah Levine Coley, Professor of Applied Developmental and Educational Psychology, Lynch School of Education

The Effects of Neighborhood Age Segregation on Adult Health
Sara Moorman, Assistant Professor, Sociology Department, College of Arts and Sciences

The African American Medical Profession and the Politics of Mental Illness, 1895–1945
Martin Summers, Associate Professor, History Department, and Director of the African and African Diaspora Studies Program, College of Arts and Sciences

(continued)
EVENT SCHEDULE

4:15 PM    BREAK

4:30 PM    SESSION III: DISEASE
Moderator: Andrea Vicini, S.J., Associate Professor, School of Theology and Ministry

A Distant Mirror: Viruses of the Past, Present, and Future
Welkin Johnson, Professor, Biology Department, College of Arts and Sciences

Nanotechnology-Enabled Disease Biomarker Detection for High and Low Resource Environments
Michael Naughton, Evelyn J. and Robert A. Ferris Professor and Chairman, Physics Department, College of Arts and Sciences

Violence Screening in College Health Centers
Melissa Sutherland, Assistant Professor, Connell School of Nursing

5:30 PM    AWARD CEREMONY & RECEPTION
William P. Leahy, S.J., President, Boston College
Undergraduate and graduate students across the University submitted abstracts of research being conducted in one of three areas related to global public health: policy, disparity, or disease. A committee of faculty members selected 26 abstracts from the submissions. During the poster session, a panel of judges will select one undergraduate and one graduate student to be recognized for their research during the award ceremony.

**Policy**

**Just the Treatment We Need: A Clinical Examination of Global Pharmaceutical Policy**

**Undergraduate Presenter:** Lucas Allen  
**Author:** Lucas Allen  
1Department of International Studies, College of Arts and Sciences, Boston College

Our world is ravaged by a terrible health problem, with blatant symptoms manifested by the suffering of millions. In a modern installment of the chronic problem of inequality, inadequate access to essential medicines causes millions of unnecessary deaths each year. The global pharmaceutical industry is not only less than ideal; it is the scandalous cause of human suffering on a massive scale. The fatal condition of pharmaceutical inequality has grown worse due to policies putting profits over human life.

With a study of medical history, symptoms, particular cases, a diagnosis, and a treatment, this research puts the global pharmaceutical industry “in the clinic” to identify a policy prescription that could heal an ailing system. The reason this malady persists is not because it is incurable, but because we have failed to prescribe a proper treatment. Gaining a correct understanding of the problem is essential before the correct solution can be found. This research also analyzes the ethical implications of patent policy and identifies the effects of current policy on those who need medicine. It uses the case study of Brazil to exemplify how problems of accessibility and affordability are made worse by the current system. It concludes that the incentive structures created by current patent policy are responsible for the perpetuation of these problems, and therefore ethically inexcusable.

While the analysis of the current pharmaceutical system reveals a bleak structure of injustice and inequality, this research analyzes proposals to create a better system. It discusses the proposal of the Health Impact Fund as a means to change the incentive structures to allow for human flourishing and social justice. This new, reformed incentive structure in the global pharmaceutical system is just the treatment we need to ensure that all humans receive the treatments they need.
The Global Women’s Health Provider: Learning about Cultural Competency through Clinical Experience Abroad

Undergraduate Presenter: Kelly DiStefano
Author: Kelly DiStefano
Connell School of Nursing, Boston College

Purpose: To advance cultural awareness and competencies in maternity nursing care for southeast Asian populations.

Specific Aim: The specific aim of my project was to learn about the practices of labor and delivery in Nepal and how they compare to those in Western culture.

Methods: Immersion and participation at the Gandaki Western Regional Hospital in Pokhara, Nepal, on the labor and delivery unit.

Findings: Vastly different resources, cultural and religious beliefs, language, and social and family structures had an effect on antepartum care, role of the family, care of the newborn, nursing’s role during labor, family participation, and on women’s willingness to seek care.

Implications: The universality of the condition of pregnant and laboring women as well as cultural and social differences have significant implications for providing women of southeast Asian populations culturally competent and safe nursing care.

Atmospheric Particle Composition Effects on Pollutant Sinks with Implications for Public Health

Undergraduate Presenters: James Brogan, Yatish Parmar
Authors: James Brogan*, Yatish Parmar*, Lindsay Renbaum-Wolff*, Andrew Lambe*, Paul Davidovits*
Department of Chemistry, College of Arts and Sciences, Boston College

Air quality is a major public health concern and may be affected by both gas and particle phase pollutants. Aerosols, suspended liquid and/or solid droplets in the atmosphere, may be small enough to enter the lungs and even permeate as far as the bronchial tubes, where their components may enter the bloodstream. Epidemiological studies show that fine particulate matter leads to significant increases in respiratory and cardiovascular illnesses and increased mortality. Further, laboratory studies in vivo and in vitro have shown that particulate matter causes pulmonary toxicity. Pollution events such as the Great Fog of ’52 and modern pollution events in Beijing include significant concentrations of soot particles.

The concentration of soot particles in the air at any given time is related to health effects and depends on the relative strength of the sources and sinks of the particles. While dry deposition (particle settling) may be important in some circumstances, the most important removal pathway for particles is wet deposition. Particles grow by absorbing water vapor and other gases. Under high relative humidity conditions, tiny water drops may form. A subset of these particles, called cloud condensation nuclei (CCN) then grow into cloud droplets that eventually deposit to Earth’s surface by rain or snow. Soot, however, is generally hydrophobic and does not act as efficient CCN.

Soot that undergoes oxidation by ozone and hydroxyl radicals in the air has substantially different properties than nascent soot. Once the soot is oxidized, it can be coated with various organic aerosols, both natural and anthropogenic. Coated soot can serve as a prime source of CCN as the coated particles may uptake water in a way that the nascent soot cannot. Our research is aimed at obtaining an understanding of how chemical composition affects the processes whereby particles are removed from the atmosphere via wet deposition by forming CCN. Specifically, our lab explores the effect of organic coatings on the CCN activity of soot and the effect of these coatings on the atmospheric lifetime of soot-containing particles. This research is directly related to public health and air quality as it leads to a better understanding of the most important sink of soot particles. The sinks of atmospheric aerosol are directly related to human exposure to such particles and the exposure directly linked to the health effects of these particles.
References:

Tobacco Control Policies and Household Expenditures on Tobacco Products

Graduate Presenter: Melissa Kull
Authors: Summer Sherburne Hawkins, Melissa Kull, Christopher Baum

Research has shown that tobacco control policies decrease the rate of adult smoking; however, with cigarette tax increases, it has yet to be examined whether households are spending more on tobacco products. This study exploits the natural experiment created by within and between state-level variation in tobacco control policies. We conducted difference-in-difference models to examine the impact of cigarette tax increases and the implementation of smoke-free legislation on tobacco expenditure and the number of tobacco products purchased.

Data were drawn from the Consumer Expenditure Survey using the 2000–2012 interview surveys, which were stacked to include all observations within households across calendar years (n=115,096). Respondents reported on household demographics and the amount spent on tobacco products. State and federal cigarette excise taxes (translated into real 2012 dollars) as well as the average retail price per pack within each state were incorporated from the Tax Burden on Tobacco, and the month/year of a state’s smoke-free restaurant legislation were incorporated from the American Smokers’ Rights Foundation. The number of cigarette packs purchased was calculated by dividing household tobacco expenditure by the average annual retail price per pack within each state. Analyses were conducted using a zero-inflated negative binomial regression with robust standard errors to cluster by household and adjusted for a range of socio-demographic characteristics and state and calendar fixed effects.

Cigarette taxes (RR=0.96, p<0.01) and smoke-free legislation (RR=0.96, p<0.01) reduced the number of cigarette packs purchased, indicating the effectiveness of tobacco control policies to reduce smoking. However, cigarette taxes (RR=1.12, p<0.01) also increased the amount of money that households spent on tobacco products, raising concerns about families’ tradeoffs in household expenditure to meet the increasing cost of cigarettes. Future research will explore whether increased spending on tobacco products is associated with reduced household expenditure on other family essentials, such as food or utilities.

“I Don’t Have Time for This”: The Effect of Stress on Empathic Motivation

Undergraduate Presenter: Max Ruge
Authors: Max Ruge, Andrea Heberlein

Empathy in medicine has been defined as realizing the patient’s feelings and emotions and relaying that understanding to the patient (Stepian & Baernstein, 2006). Although physician empathy has been linked to positive patient outcomes (e.g., Kelley et al., 2014), empathy as a whole has been shown to significantly drop only during the third year of medical school (Hojat et al., 2009). Ironically enough, this is when medical students begin working with patients for the first time. The specific cause of this drop has yet to be determined. The current study aims to understand the mechanisms underlying this empathy drop and, more broadly, the psychological barriers to physician empathy. Our experiment tests the differential effects of stress and relaxation on both the motivation to show empathy and on self-reported trait empathy. Participants
According to the most recent World Health Organization estimates, India is ranked 150th in the world in terms of life expectancy and one out of three Indian adults is underweight. These country-level figures hide a considerable regional variation in health conditions: while South Indian states are doing relatively well in terms of health indicators, the health performance of some of the most populous states is worse than that of many Sub-Saharan African countries.

We investigate one potential source of this spatial heterogeneity in health performance by analyzing the long-term effect of access to health care facilities on current individual health outcomes. To this end, we create a novel dataset that combines contemporary individual-level data from the India World Health Survey (2003) with historical data about diffusion, location, and activities of Protestant medical missions. We measure health status with individuals’ anthropometric indicators and we use geocoding tools to calculate the minimum distance between the survey’s respondents and the location of a Protestant health facility founded in the nineteenth century. We find that proximity to a Protestant medical mission has a positive and statistically significant relationship with current individuals’ Body Mass Index (BMI). We verify that this is not the result of

How Do Payer and Payee Incentives Affect Health Care?

Undergraduate Presenter: Giuliana Zaccardelli
Author: Giuliana Zaccardelli
1College of Arts and Sciences, Boston College

Physicians today treat a range of patients and deliver care under various practice structures. In the paper entitled “How Do Payer and Payee Incentives Affect Health Care?” I investigate how treatment and generic drug use varies based on patient and physician characteristics. Data from the 2006 to 2010 National Ambulatory Medical Care Survey are used to econometrically test how insurance status and the type of physician practice affect care decisions and the use of brand name versus generic drug prescriptions. In particular, I employ regression, binomial, and probit models in my analysis of care decisions and a Heckman model in my analysis of brand name versus generic prescriptions. I find that physicians working in practices with a higher percentage of revenue from managed care contracts provide more services, are less likely to schedule return appointments, and are less likely to prescribe brand name drugs than those working in practices with a lower percentage of revenue from such contracts. I also show that doctors working in practices run by health management organizations are less likely to prescribe brand name drugs than doctors working in other types of practices. Furthermore, I find that Medicare and Medicaid patients have more medications prescribed, are more likely to schedule a return visit, and are less likely to be prescribed a brand name drug than privately insured patients, while self-payers spend more time with the doctor, have fewer medications prescribed, and have fewer return appointments than the privately insured. Overall, these findings suggest important disparities in the delivery of care depending on insurance status and physician practice structure and indicate that certain insurance options and practice settings may be more cost-effective than others.

Disparity

Long-term Effects of Access to Health Care: Medical Missions in Colonial India

Graduate Presenter: Rossella Calvi
Authors: Rossella Calvi1, Federico G. Mantovanelli
1Department of Economics, Graduate School of Arts and Sciences, Boston College

According to the most recent World Health Organization estimates, India is ranked 150th in the world in terms of life expectancy and one out of three Indian adults is underweight. These country-level figures hide a considerable regional variation in health conditions: while South Indian states are doing relatively well in terms of health indicators, the health performance of some of the most populous states is worse than that of many Sub-Saharan African countries.

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other non-medical missionary activities and show that the vicinity to Protestant missions without health facilities does not contribute to explaining current health outcomes. To strengthen our identification strategy, we exploit variation in activities of missionary societies and use an instrumental variable approach to show that proximity to a Protestant medical mission has a causal effect on current individuals’ BMI. We investigate some potential transmission channels and we find that the long-run effect of access to health care is not driven by persistence of infrastructure but by improvements in individuals’ health potential and, possibly, by changes in hygiene and self-care habits.

Maternal Mortality, Democratization, Women’s Status and Ethnic Fractionalization: A Cross-National Study

Graduate Presenter: Mehmet Cansoy
Authors: Mehmet Cansoy, John Williamson
1Department of Sociology, Graduate School of Arts and Sciences, Boston College

Every year, hundreds of thousands of women die during pregnancy or immediately after birth due to reasons related to maternity. The vast majority of them live in developing countries. Since the late 1980s, this issue has garnered a significant amount of attention, but the debate, at least for policymakers, has been limited to the availability of data and the possibility of medical and health care policy interventions. While these are undoubtedly important items and policies based on them have achieved considerable success, they limit the discussion on maternal mortality significantly. In this paper, we draw on a strong literature on maternal mortality research as well as research more broadly relating to mortality and public health to argue that broader issues of income and inequality, but most importantly democratization, women’s status, and ethnic fractionalization need to be considered. Using cross-sectional analysis and path-analysis, we show that these predictors have significant impacts on maternal mortality ratios.

“Be Ye Staunch in Justice”: Muslim and Catholic Bioethical Responses to HIV/AIDS in Kenya

Graduate Presenter: Tim Carey
Author: Tim Carey
1Department of Theology, Graduate School of Arts and Sciences, Boston College

While the HIV/AIDS epidemic has garnered much international attention since the first case was diagnosed in 1981, no other geographic location has been harder hit than sub-Saharan Africa. The UNAIDS Global Report for 2013 estimates that 70% of all new infections occur in this region, with countries in eastern Africa bearing the brunt of this statistic. For example, in Kenya the secular governmental and religious response has accounted for a marked decrease in the infection rate throughout the past two decades—from a peak of 10.5% in 1996 to 6.1% among the adult population in 2013. Yet, an estimated 1.6 million Kenyans remain infected with a preponderance of these being women and young adults.

As a direct result, religious leaders in countries such as Kenya are increasingly being asked to attend to the spiritual as well as physiological nature of their congregations. Specifically in the capital city of Nairobi, priests and imams in African Catholic and Sunni Muslim communities are responding to questions of treatment and transmission of HIV/AIDS using the sophisticated language of biomedicine. Theologically, this development is in itself a form of faith seeking understanding through biomedical ethics, as both religious leaders and medical professionals attempt to derive a common vernacular with which to communicate with each other.

And while HIV/AIDS remains a challenge for both faith communities, the epidemic also represents a shared opportunity for Muslims and Catholics in Kenya to come together to engage in acts of justice toward those fellow Kenyans who are living with HIV/AIDS. When understood in this way, justice can only be attained through participation in the common good, from which those living with HIV and AIDS—both Catholic and Muslim—must never be excluded.
Co-residence with Grandparents and the Body Mass Index (BMI) During Adolescence and Early Adulthood
Graduate Presenter: Hae-Nim Lee
Authors: Hae-Nim Lee*, Summer Sherburne Hawkins*, David Takeuchi*
*School of Social Work, Boston College

Background: Adolescent obesity is a major public health issue that has increased in significance over the past three decades. Three-generational households are becoming more prevalent in the United States. Despite the rising trends in co-residence with grandparents, most research on the association between family structure and obesity has investigated adolescents in two- and single-parent households without grandparents. Few investigations examine childhood obesity in three-generational family households. To help fill this empirical gap, this paper examine (a) whether the presence of a grandparent in 1- and 2-parent households is associated with differences in body mass index (BMI) trajectories as adolescents age into emerging adulthood, and (b) to what extent adolescent race/ethnicity helps explain variations in BMI trajectories in 1- and 2-parent households.

Methods: The data come from the National Longitudinal Study of Adolescent Health and the analytic sample consists of 10,086 adolescents. The dependent variable is BMI from waves 1–3. The independent variable is the presence or absence of a grandparent in two- or single-parent households during adolescence. Family socioeconomic and health behavior characteristics were included as control variables. Growth curve models are used as the main analytic method to examine the effect of co-residence with grandparent(s) on an adolescent’s BMI over time in each type of family structure (two-parent and single-parent households). All models were run overall and then were conducted separately for each ethnic group (White, African American, Hispanic, and Asian).

Results: For the first model adjusted for ethnicity, there were no differences in BMI trajectories between those adolescents who had co-residence with a grandparent and those who did not in all types of family structure. When the model was then stratified by ethnicity, we found that Hispanic adolescents who lived with grandparents in two-parent households have significantly slower rates of BMI growth compared to those who have not lived with grandparents during adolescence (b=-0.16, p<0.05). However, this protective association was not found among Hispanic adolescents in single-parent households, nor among other ethnic groups in both single- and two-parent households.

Conclusions: These results suggest that co-residence with a grandparent may play an important role in reducing long-term obesity risk among Hispanic adolescents.

Neighborhood Age Composition and Adults’ Well-Being
Graduate Presenter: Jeffrey E. Stokes
Authors: Jeffrey E. Stokes*, Sara M. Moorman*
*Department of Sociology, Graduate School of Arts and Sciences, Boston College

Neighborhood contextual factors such as disadvantage and racial segregation are known influences on individuals’ health and well-being. Theory predicts that neighborhood age segregation will have detrimental impacts as well. This study examined the influence of neighborhood age composition on middle-age and older adults’ psychological well-being and self-rated health. Data were merged from the 2010 U.S. Census and the second wave of the National Survey of Midlife Development in the United States (MIDUS II). The sample included 4,017 individuals from 3,714 census tracts. Using random intercept models for psychological well-being and ordinal logistic regression models with clustered standard errors for self-rated health, we assessed the differing influences of 6 distinct forms of neighborhood age integration/segregation, over and above individual- and neighborhood-level factors. Results indicate that, contrary to theory, age-integrated neighborhoods do not uniquely benefit adults’ health or well-being. For psychological well-being, neighborhoods that overrepresent families appeared most detrimental, ranking significantly worse than 4 of the other 5 neighborhood age types. Age-representative neighborhoods were only significantly better than family neighborhoods for psychological well-being. For self-rated health, both family-dominated neighborhoods and age-representative neighborhoods were significantly worse than 3 of the other 4 neighborhood types, and were not significantly different from one another; neither was significantly better for health than any other neighborhood age type. Further, none of these effects varied by adults’ own age. Age-integrated neighborhoods do not appear to offer benefits in comparison with age-segregated neighborhoods, save for family-dominated neighborhoods;
in fact, age-integrated neighborhoods may be detrimental for health in comparison with various forms of age-segregated neighborhoods. Different forms of age segregation have different impacts on adults’ lives, some beneficial, others detrimental. We discuss the implications for theories of age integration/segregation as well as for health and housing policies.

Reducing Disparity Experienced by Students in High-Poverty Urban Schools via a Comprehensive Approach to Student Support

**Graduate Presenter:** Maria D. Theodorakakis  
**Authors:** Maria D. Theodorakakis¹, Mary E. Walsh¹, Terrence J. Lee-St. John¹  
¹Center for Optimized Student Support, Department of Counseling, Developmental, & Educational Psychology, Lynch School of Education, Boston College

City Connects is an evidence-based approach to student support that aims to reduce disparities experienced by children in high-poverty urban schools. City Connects exists at the nexus between two different approaches to addressing human problems in the health care field: the public health model (which is scalable and cost-effective, providing universal access to services) and the clinical model (in which intervention and change take place at the individual level). City Connects represents an amalgamation of these two approaches; it identifies the strengths and needs of every student in a school across four domains (academic, social/emotional/behavioral, health, and family) through a Whole Class Review and uses this information to connect students with a tailored set of supports on a continuum from universal prevention services to intensive individual interventions.

Statistically significant effects of City Connects on students’ academic achievement have been established (Walsh et al., 2014). It is hypothesized that City Connects may also lead to improvements in student thriving. The purpose of the current study is to determine the impact of City Connects on teacher perceptions of students’ classroom behavior. Using a regression analysis and series of t-tests, this study examines data from 8,239 Boston Public School students in grades 3–5 (who come from diverse families that speak over 80 languages) to determine whether an association exists between students’ teacher-rated behavior and the behavior strengths/needs identified through the City Connects review process. Study results demonstrate that there is a statistically significant association (p<.001) between the two variables: students with behavior-related needs have lower behavior scores and students with behavior-related strengths have higher behavior scores. The benefits associated with City Connects’ location at the intersection between public health and clinical models can be applied to a variety of contexts to reduce educational, health, and mental health disparities at national and global levels.

Disease

**Stimulating the Resolution of Tumor Debris to Control Medulloblastoma**

**Undergraduate Presenter:** Chantal A. Barksdale  
**Authors:** Chantal A. Barksdale¹, Megan L. Sulciner¹, Sesquile Ramon¹, Romain A. Colas¹, Jesmond Dalli¹, Pratiti Ban-dopadhayay¹, Sui Huang¹, Mark W. Kieran¹, Charles N. Serhan¹, Dipak Panigrahy¹  
¹Center for Vascular Biology Research and ²Department of Pathology, Beth Israel Deaconess Medical Center, Harvard Medical School; ³Center for Experimental Therapeutics and Reperfusion Injury, Brigham and Women’s Hospital, Harvard Medical School; ⁴Division of Pediatric Oncology, Dana Farber Cancer Institute, Harvard Medical School; ⁵Institute for Sys-tems Biology, Seattle, WA

Background: Tumor recurrence occurs in one-third of patients with medulloblastoma—the most common malignant pediatric brain tumor. Current clinical approaches to medulloblastoma therapy, including chemotherapy and radiation, induce apoptotic tumor cells. However, this may be a double-edged sword as the debris of dead cancer cells stimulates inflammation contributing to tumor relapse. A new direction has emerged in inflammation research with the discovery of a novel genus of endogenous pro-resolving lipid-autacoid mediators. Within this genus, resolvins and protectins have been shown to be produced and act in neural tissues. We hypothesize that resolvins and protectins represent a novel modality in medulloblastoma treatment by pharmacologically promoting the clearance (resolution) of tumor cell debris via macrophage phagocytosis of apoptotic tumor cells, thereby depriving the surviving tumor cells of inflammatory stimuli.
Results: We used two separate methods to generate apoptotic tumor cells as a source of medulloblastoma tumor debris for macrophage stimulation: the cytotoxic chemotherapeutic agent cisplatin or targeted agent JQ-1. Flow cytometry confirmed the tumor debris. Cisplatin-induced tumor debris stimulated primary tumor growth in a dose-dependent manner. Resolvin, protectin D1n-3 DPA (PD1n-3 DPA), and protectin DX (PDX) enhanced macrophage phagocytosis of medulloblastoma tumor cell debris. PD1n-3 DPA and PDX counter-regulated secretion of cytokines/chemokines, including CCL5, TNFα, CCL2, CXCL1, and CCL4, by human macrophages stimulated with cell debris. Medulloblastoma cancer progression resulted in the loss of resolvin levels. Resolvin inhibited medulloblastoma growth at nanogram levels without toxicity.

Conclusions: Our results demonstrate that enhancing endogenous clearance of tumor cell debris by resolvins and protectins represents an entirely new biological target for brain tumors including medulloblastoma.

Sleep, Stress, and Emotion Interact to Influence Memory Consolidation

Graduate Presenter: Kelly A. Bennion
Authors: Kelly A. Bennion, Jessica D. Payne, Elizabeth A. Kensinger
1Department of Psychology, Graduate School of Arts and Sciences, Boston College; 2Department of Psychology, The University of Notre Dame

Although sleep was often thought to be a time of quiescence, recent work has demonstrated that active neurobiological processes are at work, consequently affecting emotional processing and memory upon waking. It has separately been demonstrated that emotional processing and memory can be affected by stress, and that stress can affect sleep quality. The present research brings these literatures together, examining how sleep, stress, and emotion interact to influence one important dimension of cognitive functioning: memory consolidation. We first estimated participants’ stress level by measuring salivary cortisol (a stress hormone). Next, participants viewed images composed of a negative (e.g., taxi accident) or neutral (e.g., taxi) object on a neutral background (e.g., avenue) while an eye-tracker monitored their gaze. We manipulated sleep by having half of the participants learn the stimuli in the evening, preceding a 12-hour delay including a night of sleep, and the other half learn the stimuli in the morning, preceding a 12-hour waking delay. Participants then viewed the negative and neutral objects and backgrounds separately, distinguishing new objects and backgrounds from studied ones. Elevated cortisol was correlated with enhanced memory for the negative, but not neutral, objects, only if participants slept during the delay. Further, those with elevated cortisol showed a stronger relation between how long they looked at the negative objects during encoding and how likely they were to remember them, again, only if participants slept. This shows that optimal memory is achieved when cortisol is mildly elevated during an emotional event, and when sleep occurs during consolidation. Given that many disorders (e.g., mood and anxiety disorders, PTSD) are characterized by problems with sleep, stress, and emotional processing, the evidence that these factors interact highlight a need for a more nuanced understanding of their effects, and point toward sleep deprivation as an often-overlooked contributor to mental disorders.

Sleeping in a Digital World: The Role of Excessive Media Use on Adolescent Sleep Inadequacy

Graduate Presenter: Jennifer Tang Cole
Authors: Jennifer Tang Cole, Summer Sherburne Hawkins, David Takeuchi, M. Katherine Hutchinson
1School of Social Work, Boston College; 2Connell Graduate School of Nursing, Boston College

Background: To examine the role of excessive media use on sleep inadequacy among U.S. adolescents (ages 10–17) and their associated determinants. It is hypothesized that higher levels of television use (>2 hours/day) and computer use (>2 hours/day) will be associated with inadequate sleep.

Methods: Data from the 2011–2012 National Survey of Children’s Health (NSCH) were used (n=40,329). Forward step-wise logistic regressions, stratified by age group (aged 10–12 vs. 13–17), were used to examine the associations between media use and sleep inadequacy while adjusting for child-level demographics, household characteristics, health behaviors, family context, and neighborhood context. Moderating effects of media presence in the bedroom and media controls were examined.

Results: Across models, significant associations between excessive media use and sleep inadequacy were observed among older adolescents only (aged 13–17). Among older adolescents, sleep inadequacy was significantly associated with excessive
computer use (model 4, AOR, 1.30; \( p=0.001 \)) and media presence in the bedroom (model 4, AOR, 1.21; \( p=0.02 \)). Moderation analysis revealed that older adolescents that consumed television excessively and had media present in the bedroom were more likely to be sleep inadequate (interaction, \( p=0.02 \)). Across age groups, parental media limitations were non-significant moderators.

Conclusions: Almost half of U.S. adolescents examined exceeded American Academy of Pediatrics (AAP) recommendations for media consumption (≤2 hrs/day) and of those that are using media excessively, media devices in the bedroom were significant risk factors. Our findings support national public health efforts to reduce media consumption and promote sleep health among adolescents.

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**Functional Dissection of Toxoplasma gondii GAPDH1 in the Lytic Cycle**

**Graduate Presenter:** Rashmi Dubey

**Authors:** Rashmi Dubey\(^1\), Huân M. Ngô\(^1\), Marc Jan Gubbels\(^1\)

\(^1\)Department of Biology, Graduate School of Arts and Sciences, Boston College; \(^2\)BrainMicro LLC, New Haven, CT

*Toxoplasma gondii* is globally spread and estimated to already have infected one-third of the world’s population. It is the cause of severe life-threatening diseases in immuno-compromised patients (encephalitis, retinitis, myocarditis) and the cause of a variety of birth defects when contracted congenitally (spontaneous abortion, mental retardation, epilepsy, blindness).

This obligate intracellular parasite rapidly metabolizes glucose via glycolysis in the acute stage of life cycle. In absence of glucose, the parasite can use glutamine as an alternative source of energy and carbon. In eukaryotic cells, the tetrameric glycolytic enzyme GAPDH1 is a versatile protein with numerous moonlighting roles. Using a conditional knockdown allele, we established that GAPDH1 is essential for the lytic cycle of the parasite. Since this function cannot be rescued by glutamine complementation, it is likely that processes other than glycolytic activity are compromised. Many of the secondary functions of GADPH1 are mediated by post-translational modifications, several of which have been detected in *Toxoplasma*. In addition, TgGADPH1, together with other glycolytic enzymes, translocates from the cytoplasm to the cortex in extracellular parasites; however, the function and mechanism of this translocation is poorly understood. We exploited the recently established crystal structure of *Toxoplasma* to decipher the role of post-translational modification in the mechanism of GAPDH1 translocation and its relation to glycolytic activity. We established that palmitoylation, though not essential, is required for complete translocation of GAPDH1 in extracellular parasites. In addition, Ser phosphomimetic mutants show partial translocation in intracellular parasites. Our data indicate that phosphorylation of a conserved tyrosine, critical for mammalian GAPDH1 membrane association, is not required for TgGADPH1 translocation. On the other hand, catalytic activity is required for viability while the lack of activity does not affect cortical translocation. Overall, our data indicate that GAPDH1 activity is essential, and is likely regulated by phosphorylation through organizing dimers and tetramers forming the catalytic pocket.

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**The Potential Role of TACC3 in Neurodevelopmental Pathology**

**Graduate Presenter:** Matthew Evans\(^1,2\)

**Authors:** Matthew Evans\(^1,2\), Burcu Erdogan\(^1\), Belinda Nwagbara\(^1\), Laura Anne Lowery\(^1\)

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The growing tip of a developing neuron hosts an orchestra of hundreds of different genes and proteins interacting with extracellular cues to steer growth in the right direction. Mutations in genes required for this process are associated with many neurodevelopmental disorders and deficits in damage repair. The goal of our current research is to study one of the components of this pathway, known as transforming acidic coiled-coil 3 (TACC3). This gene has been linked to a multitude of processes including cell migration, promotion of axon outgrowth, and regulation of microtubule dynamics. Our lab has recently characterized it as a member of a unique class of proteins known as microtubule plus-end tracking proteins (+TIPs) that bind to the growing end of the microtubule and regulate its behavior. Microtubule-regulating genes have been associated with a number of neurological disorders, including Alzheimer’s disease, lissencephaly, and double cortex syn-
drome, through aberrations in axon outgrowth and synapse formation. We have obtained initial data suggesting that knocking down TACC3 levels in vivo significantly reduces the length and number of axons that grow out, and impairs the accuracy of their path and target finding in the developing brain. Our focus is now on how TACC3 regulates microtubule dynamics, and how this enables neuron growth and steering toward proper synaptic targets. Here, we present our findings on the role of TACC3 in these processes, suggesting that TACC3 is involved in axon outgrowth and guidance in the developing brain.

Effects of Chloramphenicol Marked Knockouts in *Streptococcus pneumoniae* on Resistance in Daptomycin

**Undergraduate Presenter:** Nathalie Lavoie  
**Authors:** Nathalie Lavoie\(^1\), Sandra Dendrick\(^1\), Tim van Opijnen\(^1\)  
\(^1\)Department of Biology, College of Arts and Sciences, Boston College

*Streptococcus pneumoniae*, a Gram-positive bacterial pathogen, is found in the nasopharynx, where it resides as an asymptomatic commensal. However, upon colonization, *S. pneumoniae* can cause ear infections, meningitis, pneumonia, and infection of the blood. Despite modern medicine’s ability to treat these infections, the increasing emergence of antibiotic resistant strains pose a serious public health threat and reinforce the need for more effective antibiotics. The *S. pneumoniae* core genome contains approximately 1,500 genes, while each strain can contain 220 unique genes. Due to this vast genetic diversity, discovering how various strains tolerate or resist the effects of antibiotics is crucial to understanding antibiotic resistance.

Tn-seq is a high-throughput genome-wide methodology for screening multitudes of strains under various antibiotic stress conditions. By creating genetic transposon libraries, we can determine which genes are essential to a strain under antibacterial stress by calculating the fitness for each gene knockout before and after treatment.

Using Tn-seq data, genes of interest were identified in two strains of *S. pneumoniae* in the presence of the antibiotic, Daptomycin. Gene knockouts (mutants) were created by transforming with a 3KB construct consisting of two 1KB regions flanking the gene of interest and a chloramphenicol drug marker. Fitness defects of 14 mutants and wild-type strains were determined through optically based growth curves collected over a 16-hour period and compared to Tn-seq data.

Overall, mutants displayed a range of phenotypic variation. Interestingly, several sets of homologous genes (similar genes between two strains) displayed different fitness defects in the presence of Daptomycin. In the van Opijnen lab, we are interested in understanding the essential genetic pathways for survival of *Streptococcus pneumoniae* in the presence of antibiotics. Further research into the roles of these pathways is necessary to improve currently available antibiotics, and for the discovery of novel therapeutics.

Predicting Young Adult Executive Function from Negative Life Events: A Longitudinal Study

**Graduate Presenter:** Miriam Heyman  
**Authors:** Miriam Heyman\(^1\), Penny Hauser-Cram\(^1\)  
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Executive Function (EF) refers to a set of regulatory processes, including use of working memory, flexibility in rule shifting, and inhibiting prepotent responses. The experience of chronic stress can be detrimental to the optimal development of EF (Jacques & Marcovitch, 2010; Shonkoff et al., 2012). Stressful experiences lead to physiological responses including heightened cortisol levels. These physiological responses influence development of the prefrontal cortex and concomitant networks, areas of the brain that are crucial for EF (Shonkoff et al., 2012). Research has suggested that because of these processes, there are relationships between extensive stress and EF (Evans & Schamberg, 2009). This research has largely focused on typically developing children. The current study extends this work by investigating the relationship between an indicator of stress, cumulative negative life events, and EF for individuals with developmental disabilities (DD).
When individuals with DD were 10, 15, and 18 years old, mothers indicated whether or not each of several stressful events had occurred in the past year. Events include “going into debt” and “divorce”; these are considered to be negative life events (NLE). The total number of NLE experienced by the family is the predictor. When the individuals with DD were 23 years old (n=39), they completed a measure of EF, the “flanker fish task” (Fan et al., 2002). A computer program presented pictures of fish, and participants pressed arrow keys according to the direction the fish were facing. Depending on specified rules, such as the color of the fish, participants were instructed to refer to the fish on the outside or in the middle of the array. Average response time was used as a measure of EF, with shorter response time indicating more efficient EF.

Analyses indicated that higher NLE scores predict less efficient EF, or longer response time (p<.05). This relationship between NLE and EF remained significant after accounting for several covariates (including cognitive skills). This suggests that family stress can influence development of EF in individuals with DD.

**Chronic Alcohol Exposure to Adolescent Rats Alters Reward- and Alcohol-driven Learning in Adulthood**

**Undergraduate Presenter:** Elizabeth Mangone  
**Authors:** Elizabeth Mangone¹, Alyssa DiLeo¹, Kristina Wright¹, Michael A. McDannald¹  
¹Department of Psychology, College of Arts and Sciences, Boston College

In the United States, alcoholism affects an estimated 72 million adults and costs the U.S. approximately $223.5 billion per year. Alcohol dependence is associated with centering behaviors and decisions on alcohol procurement and consumption while neglecting other important aspects of life. This study sought to examine the possible, opposing effects of chronic access to alcohol on learning about alcohol and natural rewards. Our working hypothesis is that chronic access to alcohol flips alcohol from an aversive event to a reward event, making it capable of supporting learning. By contrast, chronic access would blunt the ability of sugar, a natural reward, to support learning. To do this, adolescent male rats were divided into two groups: a control group (n=24) and an alcohol group (n=24). Each group was exposed to their respective solution (tap water for control, 20% ethanol for alcohol) for a 24-hour session every other day for a total of 16 sessions. Body weights and drinking in grams were recorded following each session. The rats were then subject to two flavor-learning procedures in which sugar or alcohol was paired with peppermint or almond flavors, respectively. After exposure to the paired mixtures, the rats received only the peppermint or the almond flavor to measure the degree to which the flavor acquired reward learning or aversive learning driven by alcohol or sugar. The experiment is ongoing and the most recent data will be presented.

**Identifying Dysregulated Protein Activities in Aging Using C. Elegans as a Model System**

**Graduate Presenter:** Julianne Martell  
**Authors:** Julianne Martell¹, Eranthie Weerapana¹  
¹Department of Chemistry, Graduate School of Arts and Sciences, Boston College

Elucidating protein activities dysregulated during the aging process is a vital step toward identifying signaling networks and metabolic pathways directly implicated in aging. Genetic studies in the model organism *Caenorhabditis elegans* have generated a daf-2 mutant that has a significantly extended lifespan. The daf-2-gene mutant activates daf-16, a transcription factor, which initiates gene expression changes that mediate the life-extension phenotype of this mutant. Identifying protein-activity changes that are downstream effects of DAF-16 activation will illuminate cellular pathways directly implicated in the aging process. To complement the gene expression and protein abundance comparisons that have been performed in daf-2 and daf-2/daf-16 mutants, we directly monitored protein activity changes using the tools of activity-based protein profiling. We have focused our efforts on two classes of proteins: the serine hydrolases and cysteine-mediated protein activities. Cysteine-mediated protein activities encompass diverse enzyme classes that rely on critical cysteine residues for function, including numerous proteases, kinases, ubiquitin-modifying enzymes, and oxidoreductases. Combining small-molecule probes that selectively bind to active members of these enzyme families, together with quantitative mass spectrometry-based proteomics, we have compared protein activity in daf-2 and daf-2/daf-16 mutant nematodes. We have identified several serine hydrolases as well as numerous cysteine-mediated redox-regulatory proteins, which show dysregulated activity in the daf-2 mutants. Current work is focused on verifying the identity of these dysregulated proteins and applying RNAi technology to monitor the effects of dysregulation on lifespan and other biomarkers of aging.
Sex Differences in Oxytocin Receptor Binding in the Rat Brain Arise from Sex Differences in Oxytocin Receptor mRNA Expression

Undergraduate Presenter: Laura E. Newman
Authors: Laura E. Newman, Nicholas Worley, Alexa H. Veenema

Neuropeptide oxytocin (OXT) is synthesized in and released by the hypothalamus and acts on OXT receptors present in distinct areas of the brain. This OXT system plays an important role in stress regulation and in the regulation of diverse social behaviors such as maternal behavior, social bonding, and social cognition. Recent studies have suggested that dysregulation of OXT and the OXT receptor may play a role in schizophrenia and autism spectrum disorder. Human and animal studies have shown that OXT often mediates sex-specific effects on behavioral and brain responses. This could be mediated by sex differences in the brain OXT system. Indeed, our lab recently demonstrated that there are robust sex differences in OXT receptor binding in many forebrain regions of rats with males showing higher OXT receptor binding density than females. The strongest sex difference in OXT receptor binding was found in the bed nucleus of the stria terminalis (BNST). We hypothesized that the sex differences in receptor binding could be due to sex differences in receptor mRNA expression, perhaps mediated through epigenetic mechanisms. Therefore, the current study set out to determine whether there are sex differences in OXT receptor mRNA expression in the BNST. We collected the BNST by dissecting it from coronal brain sections of male and female rats and extracted mRNA from these samples. Using Real-Time PCR, we quantified the amount of OXT receptor mRNA in the BNST. Our data indicates that there is a sex difference in OXT receptor mRNA expression in the BNST, with males showing significantly higher OXT receptor mRNA than females. These results suggest that the sex difference in OXT receptor binding in the BNST is due to differential OXT receptor mRNA expression.

Dissemination and Amplification of an Endogenous Retrovirus in the Genomes of Old World Primate Genomes

Undergraduate Presenter: Nirali M. Patel
Authors: Nirali M. Patel, Welkin E. Johnson, William E. Diehl

Endogenous retroviruses (ERVs), which are transmitted vertically following germ line integration into the host genome, comprise a significant portion of most vertebrate genomes. As such, ERVs provide an archive of ancient viral sequences containing valuable information on the relationship between virus and host genome evolution. These retroviral elements can continue to evolve, accumulating mutations over millions of years, which leads to loss of function and degradation. The most common inactivating event involves homologous recombination between the 5' and 3' LTRs, yielding a solitary long terminal repeat (LTR) and the complete loss of coding potential. Solo LTRs comprise 7% of the human genome, while ERV elements retaining some or all of the gag/pol/env sequence only account for 1%.

We identified sequences of ERV-Fc (a family of gammaretrovirus-like ERVs) in all lineages of Old World monkeys (owm), indicating that ERV-Fc endogenization began following divergence with apes (~34.4 MYA) but prior to the Colobinae-Cercopithecinae split (~19.7 MYA). Subsequently, ERV-Fc accumulated characteristic genic deletions, which independently expanded in Colobinae and Cercopithecinae lineages. We identified hundreds of ERV-Fc loci in Rhesus and Baboon, n=335 and n=610, respectively. Phylogenetic analysis showed that the ERV-Fc family branched into two separate subgroups, which we call owmERV-Fc1 and owmERV-Fc2. The Rhesus genome possesses 160 owmERV-Fc1 elements and 175 owm-ERV-Fc2 elements, while the Baboon genome harbors 165 owmERV-Fc1 elements and 445 owmERV-Fc2 elements. In contrast, the human genome contains a handful of related ERV-Fcs (n=17). The majority of owmERV-Fc2 loci encode one or more common discrete deletion variants. In contrast, most owmERV-Fc1 loci also harbor deletions, yet few such variants are shared between multiple loci. Finally, owmERV-Fc1 stopped retrotransposing several million years ago while owmERV-Fc2 has continued to retrotranspose in Baboons and may even be polymorphic in this species. These dichotomies in intra-species and intra-genomic spread suggest pressures guiding ERV mobilization may be elucidated.
Distinct Amygdalar Regions Are Differentially Activated During Fear Anorexia in Male and Female Rats

Graduate Presenter: Christina Reppucci
Authors: Christina J. Reppucci', Gorica D. Petrovich'
'Department of Psychology, Graduate School of Arts and Sciences, Boston College

Our research examines environmental influences on feeding and how cues from the environment can halt eating despite hunger or drive overeating despite satiation. Substantial progress had been made mapping the brain circuitry underlying cue-driven overeating; however, less is known about the brain substrates underlying cue-inhibited feeding. Here, we used a model of fear-cue-induced inhibition of feeding (short-term fear-induced anorexia) in male and female rats and examined brain activation within regions of the amygdala implicated in both feeding and fear-related behaviors. Anxiety and eating disorders are more prevalent in women, yet female subjects are underrepresented in both basic and clinical research. Thus, evaluating for potential behavioral and neural sex-differences was particularly important for this behavioral model. Rats were trained in alternating appetitive and aversive sessions conducted in two distinct contexts (A and B). During appetitive sessions in A, food-deprived rats consumed food pellets. During aversive sessions in B, half of rats (Experimental) received four footshocks each signaled by a tone, while the other half (Control) received the same number of tones, but no shocks. Following training, food-deprived rats were tested for consumption in A during presentations of the tone (fear-cue); no footshocks were delivered. Control groups ate substantial amounts of food, but Experimental groups significantly inhibited food intake. Two additional control groups underwent identical training except they did not have access to food during appetitive sessions or testing (No-Food Control, No-Food Experimental). Rats were sacrificed after the test to evaluate patterns of brain activation, measured by Fos induction. We found that distinct amygdalar regions within the central and basolateral areas were differentially activated during the inhibition of feeding by a learned fear-cue. Of particular interest for better understanding the neural substrates of anorexia, our results suggest that an active suppression of central amygdala contributes to the anorectic effects of fear.

Genetic and Environmental Risks Predicting Patterns of Alcohol Use and Misuse from Adolescence through Early Adulthood

Graduate Presenter: Jacqueline Sims
Authors: Jacqueline Sims', Rebekah Levine Coley', Jennifer Carrano''
'Applied Developmental and Educational Psychology, Lynch School of Education, Boston College; ‘Department of Human Development and Family Studies, University of Delaware

Alcohol use and misuse are primary public health concerns, particularly among adolescents and young adults. Based on the rapidly growing field of gene-environment models, this study sought to assess the combined role of primary environmental and dopamine-related genetic correlates of early alcohol use and misuse by evaluating the unique and interactive effects of four proposed contributors to youth alcohol use and misuse: genetic risks assessed through a genetic risk score (GRS) of dopaminergic genetic alleles; social norms from parents and peers; social control from parents and schools; and stressful life experiences.

Multilevel growth models were used to assess trajectories of alcohol use and intoxication among a sample of 13,451 youth drawn from the Add Health study, a longitudinal survey of a nationally representative school-based sample of adolescents in the U.S. who were followed from mid adolescence through the transition to adulthood. Results found no significant effects of the GRS (a combination of alleles from MAOA and DAT1), either independently or in interaction with environmental risks, on males’ or females’ alcohol use or misuse. In contrast, internal and external stressful life events were the most consistent and strongest predictors of initial levels and growth in alcohol use and misuse, with social norms supportive of alcohol use from peers and parents also showing predictive power. Environmental measures of social control, in contrast, showed few significant associations with youth alcohol use and misuse. Although males reported higher levels of alcohol use and misuse than females, environmental predictors of alcohol behaviors were largely similar for the two sexes.
The Extended Core Coax: A Novel Nanoarchitecture for Electrochemical Sensing of Disease Biomarkers

Graduate Presenter: Amy Valera

Authors: Amy Valera¹, Michelle M. Archibald¹, Jeffrey Naughton¹, Timothy Connolly¹, Michael J. Burns¹, Michael J. Naughton¹, Thomas C. Chiles¹

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Here, we report our progress on the development and fabrication of a novel nanoarchitecture, the extended core coax (ECC), for electrochemical sensing. Each ECC is a vertically oriented nanocoax comprised of an extended inner gold core and an outer chrome electrode, which are separated by an alumina dielectric. The inner gold and outer chrome metals serve as the working and counter electrodes, respectively, with a ~200 nm separation gap. Arrays with a base area of 0.1 mm² were fabricated, each containing ~10⁵ individual ECCs connected in parallel. Previous iterations of the nanocoax have demonstrated 90x greater electrochemical response over its planar counterpart due to the nanoscale proximity of the working and counter electrodes. We expect that the ECC will demonstrate at least similar sensitivity, and will offer the additional benefit of overcoming diffusion limitations due to the extended core working electrode, which extends ~200 nm above the outer metal of the ECC. Additionally, the extended gold core provides a potential substrate for biofunctionalization, making the ECC an attractive candidate for further development toward electrochemical detection of disease biomarkers such as cholera toxin and other infectious diseases.
Boston College University Libraries: Value Beyond Discovery

The libraries support researchers in many ways beyond providing rich research collections. Included in the poster display are four presentations highlighting library services critical to the research and publication process:

Data Management Services in the Boston College Libraries (Enid Karr, Barbara Mento, Sally Wyman)
In collaboration with other University partners, librarians provide support for research data management through workshops and individual consultations. Topics include data management best practices, drafting funder-required data management plans, and identifying the best data repositories to archive and share your data.

eScholarship@BC (Jane Morris and Emily Toner)
eScholarship@BC is the institutional repository of Boston College, recently given a new look and enhanced functionality by the Libraries. It provides visibility, accessibility, and preservation for your research results online. The platform can accommodate multiple formats, including datasets, texts, and video.

GIS and Global Public Health (Barbara Mento and Wanda Anderson)
Using GIS, researchers can visualize epidemiologic patterns, trace health behavior, and discover trends from local to international levels. GIS workshops are offered each semester and customized class presentations may be requested.

Research Guide for Global Public Health: Policy · Disparity · Disease (Wanda Anderson, Enid Karr, Barbara Mento, Kate Silfen)
This online research guide serves as a starting point for research on global public health issues, bringing together recommended resources available at Boston College and elsewhere. It includes books, journal research databases, news feeds, maps, data, and websites.

Population Health Nursing: Health Infographic

Improving the Health of Vulnerable Populations: Using Infographics to Communicate Public Health Issues
Infographics, visual representations of information, are gaining in popularity as a compelling way to convey issues important to improving the public’s health. Senior nursing students in NU 4260 Population Health Nursing were asked to create a health infographic reflective of the theme, Improving the Health of Vulnerable Populations: Using Infographics to Communicate Public Health Issues. The focus was on depicting a public health issue in a vulnerable population or targeting a vulnerable population with a specific public health communication message (health promotion, risk reduction, disease prevention). It was their job to inform the public about the needs of a vulnerable population or explain a public health message to members of a specific vulnerable population through choice of content, visuals, and captions. Top submissions in the following five categories were selected: most eye catching, best use of data or facts, most compelling prevention message, best targeted message to a vulnerable population, and best presentation of public health issues to promote awareness. The six winning infographics on display are:

1. Healthy Hands by Kristen Ambrose
2. TDAP Vaccination in Pregnancy by Sabrina Caraffa
3. Tuberculosis Busting Myths by Catherine Adams
4. Love Your Body by Amala Sookal
5. Child Abuse Reporting by Molly Price
6. Cervical Cancer Screening by Anna Blaikie
Philip J. Landrigan, M.D., M.Sc., the Ethel H. Wise Professor of Preventive Medicine, is a pediatrician and epidemiologist. He has been a member of the faculty of the Icahn School of Medicine at Mount Sinai since 1985 and chair of the Department of Preventive Medicine since 1990. He was named dean for Global Health in 2010. Dr. Landrigan is also the director of the Children’s Environmental Health Center.

Dr. Landrigan graduated from Boston College in 1963 and from Harvard Medical School in 1967. He completed an internship in medicine/pediatrics at Cleveland Metropolitan General Hospital and a residency in pediatrics at Children’s Hospital Boston. In 1977, he received a Diploma of Industrial Health from the University of London and a Master of Science in Occupational Medicine degree from the London School of Hygiene and Tropical Medicine. He served for 15 years as an Epidemic Intelligence Service Officer and medical epidemiologist at the Centers for Disease Control and Prevention (CDC) and the National Institute for Occupational Safety and Health (NIOSH). While at the CDC, Dr. Landrigan served for one year as a field epidemiologist in El Salvador and for much of another year in northern Nigeria. He participated in the Global Campaign for the Eradication of Smallpox. Dr. Landrigan directed the national program in occupational epidemiology for NIOSH. He was awarded the Meritorious Service Medal of the U.S. Public Health Service.

In 1987, Dr. Landrigan was elected a member of the Institute of Medicine of the National Academy of Sciences. He served as editor-in-chief of the American Journal of Industrial Medicine and editor of Environmental Research. He has published more than 500 scientific papers and five books. He has chaired committees at the National Academy of Sciences on Environmental Neurotoxicology and on Pesticides in the Diets of Infants and Children. From 1995 to 1997, Dr. Landrigan served on the Presidential Advisory Committee on Gulf War Veterans’ Illnesses. In 1997–1998, he served as senior advisor on Children’s Health to the Administrator of the U.S. Environmental Protection Agency and was instrumental in helping to establish a new Office of Children’s Health Protection at EPA. From 2000–2002, Dr. Landrigan served on the Armed Forces Epidemiological Board. He served from 1996 to 2005 in the Medical Corps of the United States Naval Reserve, retiring in 2005 at the rank of Captain. He continues to serve as surgeon general of the New York Naval Militia, New York’s Naval National Guard.

Dr. Landrigan is known for his many decades of work in protecting children against environmental threats to health. His research combines the tools of epidemiology with biological markers derived from clinical and laboratory medicine. Dr. Landrigan is deeply committed to translating research into strategies for health protection and disease prevention.
Rebekah Levine Coley is a professor in the Department of Counseling, Developmental, and Educational Psychology at Boston College’s Lynch School of Education. As a developmental psychologist, Dr. Coley’s research interests center on the intersection of development science and social policy. Her research focuses on the needs and contexts of low-income families, addressing processes and policies regarding poverty and family economic resources, family structure and parenting, early educational contexts, and housing and neighborhood contexts. Dr. Coley’s research has been published in dozens of leading journals and edited volumes, and has received funding from the National Institute of Child Health and Human Development, the U.S. Assistant Secretary for Planning and Evaluation, the W.T. Grant Foundation, the MacArthur Foundation, the Joyce Foundation, the Casey Foundation, the Robert Wood Johnson Foundation, and the Spencer Foundation. Dr. Coley is a recipient of a Fulbright Senior Scholar Award and a Social Policy Award from the Society for Research in Adolescence.

Dean Hashimoto is an associate professor at the Boston College Law School who teaches health care law and has published extensively on a number of legal and policy issues connected to the intersections of science, medicine, and law. He has collaborated on interdisciplinary research at the Harvard Center for Work, Health, and Well-being, the Workers Compensation Research Institute, and the Massachusetts Department of Public Health. After graduating from Yale Law School, he served as a law clerk for Justice William Brennan on the U.S. Supreme Court and worked at the law firm of Ropes & Gray before joining the BC Law faculty. He also graduated from medical school at the University of California, San Francisco, and serves as the chief of occupational and environmental medicine for Partners HealthCare at Massachusetts General Hospital and Brigham and Women’s Hospital.

Summer Sherburne Hawkins is an assistant professor at the School of Social Work (SSW) at Boston College. She joined the SSW faculty in 2012. Dr. Hawkins is a social epidemiologist with an interest in addressing policy-relevant research questions in maternal and child health. Her research examines the impact of policies on health disparities in parents and children, particularly using methodology that integrates epidemiology and economics. Dr. Hawkins has published on the topics of parental smoking, infant feeding practices, and childhood obesity as well as the impact of state- and local-level policies on disparities in these health behaviors and outcomes. Prior to joining SSW, Dr. Hawkins was a Robert Wood Johnson Health & Society Scholar at the Harvard School of Public Health.

Welkin Johnson is a professor in the Biology Department at Boston College. He began his research career as an undergraduate at the University of California Berkeley. In 1991, he moved to Boston to work on retroviruses as a graduate student at Tufts University School of Medicine. After completing his Ph.D., Dr. Johnson became a postdoctoral fellow at Harvard Medical School, where he studied the AIDS-causing retroviruses of humans (HIV) and other primates (SIV). In 2005, he joined the faculty of the Department of Microbiology and Molecular Genetics at Harvard Medical School, and then in 2011, Dr. Johnson moved to the Biology Department at Boston College. Professor Johnson’s research team at Boston College includes undergraduates, graduate students, and postdoctoral fellows engaged in studying the molecular, genetic, and evolutionary interactions between retroviruses and their hosts.
James F. Keenan, S.J., is the Peter Canisius Chair, director of the Jesuit Institute, and director of the Gabelli Presidential Scholars Program at Boston College. A Jesuit priest since 1982, he received a licentiate and a doctorate from the Pontifical Gregorian University in Rome. He has edited or written 16 books and published over 300 essays, articles, and reviews in over 25 international journals. He has been a fellow at the Institute of Advanced Studies at The University of Edinburgh, the Center of Theological Inquiry, Princeton, and the Instituto Trentino di Cultura. Fr. Keenan is the founder of Catholic Theological Ethics in the World Church (CTEWC) and chaired the “First International Cross-cultural Conference for Catholic Theological Ethicists” in Padua, Italy. Following that experience, he hosted another international conference of theological ethicists in Trento, Italy. Today CTEWC is a live network of over 1,000 Catholic ethicists (www.catholicethics.com).

Sara Moorman is an assistant professor in the Department of Sociology at Boston College. She received her Ph.D. from the University of Wisconsin, Madison. Her research studies the health and well-being of older adults from the life course perspective, focusing on the family as a key social institution that influences individual aging. While much work in family sociology has emphasized resilience, support, cohesion, and other benefits of kinship bonds, her work emphasizes contexts in which these ties are not protective. A classic paper in sociology is called “The Strength of Weak Ties.” One might say that the theme of her work has been “The Weaknesses of Strong Ties.” With the support of a grant from the Institute on Aging at Boston College, Dr. Moorman is examining the ways in which neighbors affect adult health. The research on neighborhoods has emphasized the importance of social cohesion and social trust to psychological well-being, and lamented that today many Americans “bowl alone” without benefit of community integration and civic connection.

Michael J. Naughton is Evelyn J. and Robert A. Ferris Professor and Chairman of the Department of Physics at Boston College. Dr. Naughton is a National Science Foundation Young Investigator awardee and a fellow of the American Physical Society. A condensed matter experimentalist with 180 publications and 5,700 citations, Dr. Naughton’s research focuses on electrical, optical, and magnetic properties of low dimensional and nanoscale matter, including nanostructured bio/chemical and neuroelectronic sensors, solar cells, near-field optics and plasmonics, and molecular organic superconductors. Dr. Naughton has 20 issued and 10 pending patents on micro and nanoscale magnetometry, plastic landmine detection, and nanocoaxial electrodes for microscopy, photovoltaics and sensing. He co-founded Tau Sensors LLC and Solasta Inc., and presently serves on the technical advisory boards of Bloo Solar and NBD Nano. Dr. Naughton received a B.S. in physics from St. John Fisher College, a Ph.D. from Boston University, and was a post doctoral fellow at the University of Pennsylvania.
Faculty Panelists (continued)

**Erika Sabbath** is an assistant professor in the School of Social Work at Boston College. Dr. Sabbath is a social epidemiologist whose research focuses on the contribution of workplace exposures to health disparities at older ages. She has worked extensively with a cohort of now-retired French utility workers to understand the contribution of lifetime work exposures, particularly chemicals and psychosocial stress, to later-life health outcomes such as cognitive deficits. She also researches the shorter-term health and economic consequences of work stressors such as bullying, work-family conflict, and poor supervisor support. She is particularly interested in understanding and addressing the health risks facing low-wage workers, and in occupational exposures in the health care setting. Dr. Sabbath holds a joint doctorate from the Harvard School of Public Health and the University of Paris Xi-Sud. She is currently the principal investigator of a K01 Career Development Award from the National Institute for Occupational Safety and Health.

**Martin Summers** is associate professor of history and the director of the African and African Diaspora Studies Program. He is a cultural historian of the nineteenth- and twentieth-century U.S., with particular research and teaching interests in race, gender, sexuality, and medicine. He regularly teaches courses on post-1865 U.S. history, gender and sexuality in African American history, health and disease in the African Diaspora, and the history of masculinity in the United States. Summers’s current research project is a social and cultural history of medicine which focuses on African American patients at St. Elizabeths Hospital, a federal mental institution in Washington, D.C. The project uses the hospital as a case study in which to explore the intersections of the historical process of racial formation, medical and cultural understandings of insanity, and the exercise of institutional power. He is the co-editor most recently of Precarious Prescriptions: Contested Histories of Race and Health in North America (2014). Summers’s research has been supported by the Ford Foundation, the American Council of Learned Societies, the Radcliffe Institute for Advanced Study, and the National Humanities Center.

**Melissa Sutherland** is an assistant professor at the Connell School of Nursing at Boston College. Clinically, she practiced as a family nurse practitioner in upstate New York for 10 years, working with patients and populations with a specific focus on sexually transmitted infections and tuberculosis. Her research addresses the issue of interpersonal violence and its influence on health outcomes among adolescent and young adult women. Dr. Sutherland’s work has been published in peer-reviewed nursing and interdisciplinary journals and funded by intramural and extramural research grants. She is a recent recipient of an R03 grant from the National Institute of Child Health and Human Development to examine intimate partner violence (IPV) and sexual violence (SV) screening in college health centers. Her expertise has resulted in invited positions on the Boston Public Health Commission’s Chlamydia Advisory Board, the Committee for Community Service Board at Boston Children’s Hospital, and the Massachusetts Sexual Assault Nurse Examiner Multi-Disciplinary Advisory Board. Dr. Sutherland was involved in the initiative to develop an interdisciplinary Public Health Minor at BC. In spring 2014, she taught the first course in the new initiative, Public Health in a Global Society.
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