



SIXTH ANNUAL NORTHEASTERN PENNSYLVANIA RESEARCH SYMPOSIUM PROCEEDINGS



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The 2013 Research symposium was hosted by:



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ABOUT THE KEYNOTE SPEAKER: DR. STEVEN J. SCHEINMAN

Steven J. Scheinman, MD, joined TCMC in September 2012 as president and dean. Dr. Scheinman is an exceptional leader with a strong and broad vision to advance the College's educational, administrative, and research activities in exciting new ways.

Dr. Scheinman brings outstanding leadership and academic credentials to TCMC. He comes to us from SUNY Upstate Medical University, where he was professor of medicine and pharmacology and served for eight years as its senior vice president and dean of the College of Medicine.

Board-certified in internal medicine and nephrology, Dr. Scheinman has earned international prominence for his research into the genetics of inherited kidney diseases and kidney stones. Dr. Scheinman holds an A.B., summa cum laude, from Amherst College in Massachusetts and received his medical degree with honors from Yale University. He completed his residency in internal medicine at Yale-New Haven Hospital; was chief resident in internal medicine at Upstate; and completed fellowships in nephrology at Upstate Medical Center and Yale-New Haven Hospital. He was an attending physician at University Hospital, Crouse-Irving Memorial Hospital and Veterans Ad-



The Award for Best Paper went to Dr. Raj Kumar of The Commonwealth Medical College. Dr. Kumar's work was entitled "A Novel Mechanism of Steroid Hormone Receptor Action and its Therapeutic Implications in Endocrine Cancers."

Best Paper Awards

Shannon Collins, a student at Marywood University, received the Award for Best Student/Faculty Paper. Sarah's paper was entitled "Mindfulness, Self-Compassion, and Empathy."



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TOWARDS AN UNDERSTANDING OF SECOND *LIFE* VIRTUAL WORLD ADOPTION IN INSTITUTIONS OF HIGHER EDUCATION

Mark Choman, Luzerne County Community College, Marywood University
Dr. Uldarico Rex Dumdum, Marywood University



Mark Choman



Dr. Uldarico Rex Dumdum

ABSTRACT

Second Life (SL) is one of many computer-based Internet-accessible multi-user 3-D virtual world environments. Launched in 2003, *SL*, once the largest virtual world environment with millions of registered user-residents with a thriving economy, is widely adopted in business and government and, increasingly, in educational institutions. Institutions of Higher Education (IHEs) are making greater investments in virtual world environments. This study, a research in progress, uses a grounded theory approach to identify emergent themes to better understand the selection and adoption of the *Second Life* virtual world environment in institutions of higher learning. Chief technology officers, instructional technologists, and faculty were interviewed. It utilizes *Atlas.ti*, a popular qualitative research data analysis software tool, to help identify emergent data keywords, categories, and themes for further analysis. In this research presentation we report the results of two iterations of data analysis, developing an initial understanding of the richness of our study context and probing into the emergent concerns of each of the three interview participant groups. Ultimately, the study aims to capture and provide a thick description of the contextual factors and practices that support, facilitate or hinder adoption of a virtual world environment in particular, and instructional technology, in general, in IHEs.

A TYPOLOGY OF PROBLEMS OBSERVED IN CARE PLANNING FOR NURSING HOME RESIDENTS WITH DEMENTIA

*Dr. Dennis G. Chapman & Joseph A. DeRosa, Donald C. Barnes, Megan K. Lambert
Marywood University*



Dr. Dennis G. Chapman

ABSTRACT

As life expectancy in the United States reaches historically high levels, dementia and other aging disorders will also increase and, in many cases, require nursing home care. For example, between 1991 and 1997, the percentage of nursing home residents with dementia increased from 35% to 42% (Harrington & Carillo, 1999). What kinds of problems and needs will this burgeoning nursing home population present? In an effort to understand the needs of this population, this study described and categorized the problems observed in developing care plans for 118 nursing home residents with dementia. The needs of each resident were assessed and individualized care plans were developed. The problems identified on the care plans were aggregated and categorized using a six-dimensional framework. A count of the problems by category found that medical (primarily pain) and behavior (primarily agitation) problems comprised 64% of all the identified problems. Psychological and psychosocial problems (primarily depression) comprised 16% of all the identified problems. Issues related to family, spiritual, and meaningful activities made up the balance of the observed care plan problems.

THE EMERGING ROLE OF REGULATORY HEME IN ENVIRONMENTAL NEUROTOXICOLOGY AND ALZHEIMER'S DISEASE

*Hani Atamna
The Commonwealth Medical College*



Hani Atamna

ABSTRACT

Regulatory heme (RH) regulates specific factors essential for transcription regulation, microRNA processing, neuronal differentiation, circadian rhythm and protein translation. However, the dynamics of intracellular RH in living cells has not been examined until this study. We investigated the cellular biochemistry of RH using neuroblastoma (SHSY5Y) and normal fibroblasts (IMR90). Incubating the cells with hemin (a source for heme) increases RH while treating with N-methyl-protoporphyrin-IX (specific inhibitor of heme synthesis) decreases RH. RH is < 1% of total heme. RH is dynamic and modulated by physiologic and toxic factors. Intracellular concentration of RH in SHSY5Y and IMR90 is 123 ± 4 nM and 62 ± 6 nM, respectively. The intracellular concentration of RH is consistent with the binding constants of heme to specific RH-regulated proteins. RH concentration in IMR90 cells is cell cycle-dependent. RH is susceptible to low concentrations of Lead, Mercury, and Amyloid- β (Ab). Conversely, total heme (housekeeping heme-proteins) is more resistant to these neurotoxins. Mercury and Lead are inhibitors of heme synthesis and implicated in cognitive impairment in children. Ab binds tightly with heme and is neurotoxic to mitochondria and synapses causing Alzheimer's disease. Our findings highlight the significance of specific neurotoxins in impairment of RH homeostasis and its potential link to brain disorders.

A NOVEL MECHANISM OF STEROID HORMONE RECEPTOR ACTION AND ITS THERAPEUTIC IMPLICATIONS IN ENDOCRINE CANCERS

Raj Kumar
The Commonwealth Medical College



Raj Kumar

ABSTRACT

Steroid hormone receptors (SHRs) are important therapeutic targets in several diseases including inflammation, hormone-dependent cancers, osteoporosis, and cardiovascular disease. SHR activity is largely mediated through two activation function regions: i) AF1 in the intrinsically disordered (ID) N-terminal domain (NTD); and ii) the AF2 in the conserved, highly structured ligand binding domain (LBD). Functional synergy between AF1 and AF2 is an essential component of SHR-target gene regulation. However, due to available LBD/AF2 crystal structures, the current design of small molecule selective receptor modulators for clinical uses is primarily based on their modulation of co-regulatory protein motif interactions with AF2, which often fail to inactivate AF1, resulting into unwanted side effects. In this study, we show that the ID AF1 domain of the glucocorticoid receptor (GR) adopts a functionally folded conformation due to its direct binding with a target protein. Using biophysical/structural techniques, we found that AF1 adopts a significantly higher secondary/tertiary structure at the expense of its random coil configuration. Further, we show that this induced-structure formation specifically enhances AF1-mediated GR transcriptional activity. These data demonstrate a mechanism through which AF1 may regulate target gene expression, information essential for improved therapeutic targeting of SHRs. This “coupled binding/folding process” upon SHR-coregulator interaction may be modifiable by drugs especially related to endocrine cancers.

CLUBHOUSE FOR PSYCHIATRIC RECOVERY: MEMBERSHIP, SENSE OF COMMUNITY, AND EMPOWERMENT

Dr. Kimiko Tanaka & Melody R. Collins (Student)
Marywood University



Dr. Kimiko Tanaka

ABSTRACT

Sense of community and empowerment constitute crucial aspects of psychiatric recovery (Brown & Lucksted, 2010; Masterson & Owen, 2006); yet, research into these areas in the context of the clubhouse recovery model is at the infant stage. The study examined the relationships between the length of membership and two major aspects of psychiatric recovery; the sense of community and the level of empowerment among members in clubhouses for psychiatric recovery. Quantitative data (N=67) analyzed for this study were collected as part of a larger study conducted in 2009-2012 at two U.S. clubhouses located in geographically different major cities. Scales utilized included the Empowerment Scale (Rogers, Chamberlin, Ellison & Crean, 1997) and the Collective Self-Esteem Scale (Luhtanen & Crocker, 1992). Correlation analysis indicated that the relationship between the sense of community and the length of membership is significant ($r(65) = .283, p < .05$), suggesting that the sense of community is enhanced with continued association with the clubhouse. Further research should explore how clubhouse participation leads to enhanced sense of community; further sophisticated analysis should look into the somewhat counter-intuitive null finding between the length of membership and level of empowerment.

NURSING IN SAUDI ARABIA

Nouf Alrehaili
Marywood University

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Nouf Alrehaili

ABSTRACT

Despite a growing need for healthcare in Saudi Arabia, Saudi females in the nursing profession continue to be looked down upon due to cultural traditions. Such cultural perceptions keep many Saudi females from entering a profession which not only contributes to the health of the society but which may also add their own sense of fulfillment. This paper presents information regarding the traditionalist perspective as well as reasons why this perspective should be mediated in favor of more adequately supporting nursing as a legitimate career option for Saudi women including fostering the respect due such an honorable profession. The authors conclude by offering suggestions of ways in which the healthcare community in the United States might assist in the requisite perspective shift.

IMPROVING GLOBAL HEALTH FOR WOMEN: A CASE STUDY OF MATERNAL HEALTH INDICATORS IN RURAL TANZANIA

Linda A. Winkler, Wilkes University
Marisa Winkler, Case Western School of Medicine
Katie Bradley, University of California, Davis



Linda Winkler



Marisa Winkler



Katie Bradley

ABSTRACT

The United Nations (UN) and World Health Organization (WHO) advocate for significant improvement in maternal health outcomes as part of the Millennium Development Goals (MDG) in order to improve the quality of life for women and their families. Consequently, many nations have launched initiatives to reduce maternal mortality and improve health indicators of women (MDG 5). This study examines these initiatives and several maternal health indicators in rural Tanzania at Nyakahanga District Hospital. Information on obstetric care was collected from public records, medical records and personal observation from 2001-2011. An additional aspect of maternal care, the operation of the Prevention of Mother-to-Child HIV transmission program (PMTCT) was examined over a twenty-six month period from 2005-2007. Results indicate that Nyakahanga hospital has successfully reduced maternal mortalities (MMR) by 64% over the study period while deliveries increased by 66%. Their 2010 MMR (430) is better than the national average (790) despite recurrent staffing constraints. These changes are attributed to many factors including educational training and public health campaigns. The PMTCT program has been less successful with nearly half of our sample not being tested during prenatal visits. A minority of pregnant HIV+ women followed the medication and obstetric guidelines of this program.

AFRICAN SISTERS MUTUAL AID GROUPS: A MIXED-METHODS STUDY

Dr. Eric Stein, Dr. Diane Keller, & Kristin DeVries
Marywood University



Dr. Eric Stein



Dr. Diane Keller

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Kristin DeVries

ABSTRACT

This research is part of a larger evaluation of a program, the Sisters Leadership Development Initiative (SLDI), which has provided leadership training for women religious across six countries in Africa since 2006. Our mixed-methods study investigates the experiences of 100 African Sisters who completed ten weeks of leadership training. Data consists of responses to likert-type questions and open-ended narratives from questionnaires distributed to participants who attended alumnae groups in 2012. Mutual aid groups have a rich history and tradition in the social work field (Shulman, 2011; Northen & Kurland, 2001; Schwartz, 1961). Members of mutual-aid systems pursue both individual and group goals, utilizing each other's strengths, resources and experiences to solve common problems. Though not an original objective of SLDI, mutual aid processes have emerged through informal networking. The study examines participants' engagement in mutual aid in the form of networking, seen herein as the communication between participants regarding training topics and skills, including how confident they felt in utilizing networking skills. Through this exploration, we consider ways in which technology may be used in participants' pursuit of networking as well as the characteristics of participants who network.

GRAPPA REGULATES EPITHELIAL CELL DEVELOPMENT IN FLIES AND IS LINKED TO GROWTH CONTROL VIA A CELL SIGNALING PATHWAY

Dr. Greg Shanower, Mike Rasavi (Student), Argit Marishta (Student)
The Commonwealth Medical College



Dr. Greg Shanower

ABSTRACT

grappa (gpp) is the *Drosophila melanogaster* ortholog of Dot1L, a human gene encoding a histone methyltransferase responsible for mono-, di-, and tri- methylating the lysine 79 (K79) residue of Histone H3. Methylation of Histone H3 K79 via Dot1L is directly linked to active gene transcription, maintenance of telomeric silencing, and regulation of cell cycle progression through the G1/S and G2/M interface. gpp is an essential gene in *Drosophila* necessary for the normal maintenance of transcriptional expression of the homeotic loci. Mutations in gpp manifest both trithorax and Polycomb group phenotypes suggesting that this gene may function in both the maintenance of transcriptional activation and silencing. However, to date very few studies have examined the role this histone methyltransferase plays in developmental processes.

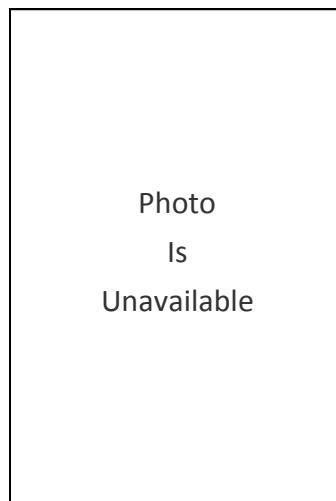
We have characterized the role gpp plays in the regulation of epithelial cell development in flies. Our data suggests that gpp regulates a signal transduction pathway involved in epithelial cell growth. This signaling pathway is involved in multiple aspects of carcinogenesis in human cells. However, the transcriptional regulation of this signaling pathway is not well defined in either flies or humans. Therefore, we present data illustrating gpp's role in the regulation of this signaling pathway in flies.

SHOULD TEACHER PREPARATION MOVE TO A CLINICAL-BASED MODEL?

*Stephen L. Broskoske & Dr. Kingsley Banya
Misericordia University*



Stephen L. Broskoske



Dr. Kingsley Banya

ABSTRACT

Due to concerns that many programs do not provide teachers with a rigorous clinical experience that prepares them for the schools in which they will work, there is a growing trend in teacher preparation to follow a medical model of professional preparation (AACTE, 2010; NCATE, 2010; U. S. Department of Education, 2011). This move involves removing much of teacher preparation from the traditional college classroom and conducting the majority of the educational experience in the clinical/field setting. There are many challenges to this paradigm change: a) universities are not designed, philosophically or structurally, to support clinically-based teacher education; and b) the design of universities makes change slow and difficult. Urged on by political pressure, strong academic leadership will be needed to bring about this shift in teacher education if it is to be accomplished.

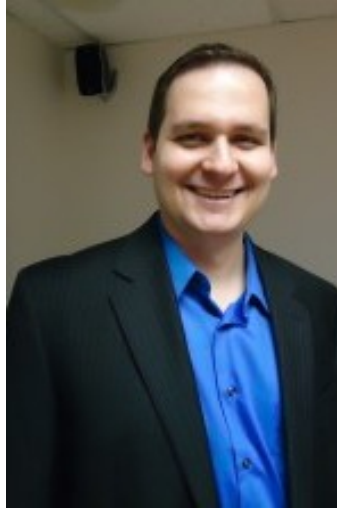
The purpose of this session is to examine the rationale and background of the growing trend to move teacher preparation to a clinically-based model as used in medical preparation. The session will also examine the readiness of institutions to effect this change, recent initiatives, and the position of certifying agencies and professional organizations such as NCATE, AACTE, PDE, and the U. S. Department of Education.

HARNESSING DATA MINING MODELS TO ENHANCE TRADING EFFECTIVENESS

*Dr. Ahmed Gomaa, Daniel Sputa (Recent Graduate), & Dr. Uldarico Rex Dumdum
Marywood University*



Dr. Ahmed Gomaa



Daniel Sputa



Dr. Uldarico Rex Dumdum

ABSTRACT

Predicting stock price movements with ever increasing accuracy can have a profound impact on the finance industry. It can enhance trading effectiveness resulting in valuable business outcomes, better investment decisions and better risk management. As such, traders, analysts, investors and hedge funds are always looking for techniques and models to better predict stock price movements (INFORMS, 2011). This is a great challenge due to its complex and volatile nature.

In our prior research, we identified the weight and threshold of financial statement ratios and used several data mining models to identify the most relevant variables with strongest predictability for predicting stock price movement on a quarterly basis. Our results showed an accuracy of 71.4% based on 23 financial variables given a company stock price is very stable in comparison to market volatility with a company beta of one or less. In this paper, we build on our prior research and focus on higher levels of company risks and compare prediction accuracy of several data mining models including Naïve Bayes, Neural Networking, decision trees, linear regression, and Association rules. We placed our analysis on the published financial statements for five previous years of 100 companies listed in the S&P 500 index.

MALE COLLEGIATE FOOTBALL PLAYER WITH TESTOSTERONE DEFICIENCY AND PITUITARY APOPLEXY SECONDARY TO CONCUSSION

Gregory K. Janik & Annemarie Guest (Student)
Kings College



Gregory K. Janik

ABSTRACT

Traumatic Brain Injuries (TBIs) that result in abnormalities of the pituitary are usually caused by “blast-related” injuries (military situations) or from sports such as boxing and kickboxing. It is rare that a young male would present with any pituitary abnormalities after a concussion sustained during a football contact during a typical lineman’s drill. Further, abnormalities within hormone levels add to the uniqueness of this case. This patient was successfully treated for his high levels of prolactin which helped to regulate his testosterone levels.

MINDFULNESS, SELF-COMPASSION, AND EMPATHY: A STUDY OF GRADUATING MSW STUDENTS

Dr. Christine Kessen, Dr. Kielty Turner, & Shannon Collins (Student)
Marywood University



Dr. Christine Kessen



Dr. Kielty Turner

ABSTRACT

The concepts of mindfulness, self-compassion, and empathy are central to Social Work practice. However, research suggests that empathy decreases during professional training in Social Work as well as other helping professions (Hojat et al. 2009; Stratton, Saunders, & Elam, 2008; Bellini, Baime, & Shea, 2002). Yet, Social Work professors report that aspects of the Undergraduate and Master's level curriculums mitigate this decrease. This study examines whether students with a Bachelor's degree in Social Work (BSW) fare better in these qualities than traditional Master of Social Work (MSW) students without this preparation. In addition to examining aspects of the curriculum, quantitative measures were administered to a cohort of graduate Social Work students multiple times to assess the presence of these qualities from the beginning of graduate study to graduation. This presentation will show that while some measures decreased in BSW prepared students, others increased. Further, some differences in scores were observed between traditional and BSW prepared students at graduation.

THE FUTURE OF SPA CARE ENSURING HEALTH & WELLNESS

*John N. Mellon
Misericordia University*



John N. Mellon

ABSTRACT

To identify untapped consumer markets for service businesses, this study collected and analyzed empirical data revealing spa services that appeal to males and females, reasons for visiting spas, and why they would encourage other untapped consumer markets to visit spas. A twenty-three (23) question survey instrument was administered during March thru June, 2012 to males and females over the age of 18 years old with resulting $n = 501$.

Diffusion of Innovations focusing on persuading individuals to accept “reinvention” of products and behaviors to better fit the needs of individuals. In Diffusion of Innovations it is not people who change, but the innovative products.

Support for innovative spa targeted consumer services was a major result of this survey research including: 1. For both males & females who walks with a cane, crutches, or walker to visit a spa for a lower back, hip, and/or leg massage for health and wellness, 2. Overweight males & females to participate in back, hip, and leg massage for health and wellness and 3. For males to schedule a pedicure, without polish, that includes a foot, ankle, and lower leg massage and whirlpool for health and wellness. The survey results will be utilized to develop strategic marketing plans for spas.

DEVELOPING AND SUSTAINING A CULTURE OF EVIDENCE-BASED ASSESSMENT FOR INSTITUTIONAL EFFECTIVENESS: A RESEARCH IN PROGRESS

Dr. Uldarico Rex Dumdum & Dr. Murray J. Pyle
Marywood University



Dr. Uldarico Rex Dumdum

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Dr. Murray J. Pyle

ABSTRACT

The demand for accountability, transparency, assessment and continuous improvement for institutional effectiveness in higher education has never been higher. Institutional effectiveness is the degree to which an institution or an institutional unit is meeting its stated mission. Its effectiveness is not captured in what is taught and how, but rather in what students have learned. This study, an action research in its initial stages, investigates how a culture of evidence-based assessment tightly linked to continuous improvement takes root in an institution and becomes a principal basis for increasing institutional effectiveness. This research presentation draws actionable insights from industry and higher education and discusses its implications and next steps implementation. Ultimately, the study aims to capture and provide a robust description of the contextual factors and practices that support, facilitate or get in the way of the mobilization, implementation and institutionalization of a culture of evidence-based assessment. The researchers are actively engaged in bringing about this change in their institutional unit while conducting research.

THE CURVE OF COMPLEXITY: THE MEDICO-LEGAL DIMENSIONS OF SOCIAL SECURITY DISABILITY BENEFITS AND SUPPLEMENTAL SECURITY INCOME BENEFITS

*Attorney Charles L. Consagra
Keystone College*



Attorney Charles L. Consagra

ABSTRACT

The legal requirements in order to obtain Social Security Disability Benefits and Supplemental Security Income Benefits requires the legal scaffold to build the medical evidence in order to establish disability on behalf of patients. Over the past few years, it has become extremely difficult in order to obtain Disability Benefits on behalf of patients. Therefore, in order to obtain Disability Benefits and Supplemental Security Income, It is incumbent upon both the legal and medical practitioner to obtain a level of understanding and cooperation. The medical practitioner needs to understand the requirements of the Social Security Administration from a legal perspective in order to adequately represent and present the medical issues which have rendered his or her patient as disabled.

A BLACK FACULTY REFLECTIONS ON TEACHING ABOUT RACE IN THE ACADEMY

Dr. Kingsley Banya
Misericordia University

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Dr. Kingsley Banya

ABSTRACT

Teaching a Race and Ethnicity Course in a predominantly white environment is a very delicate task given the emotionally charged state of race and ethnic relations in the United States. As a faculty member of color, who has taught for three years a class on Cultural Awareness, I experience a role conflict: being black raises expectations of “loyalty” to “your people,” a posture of advocacy in addressing the Black experience in America. This conflicts with the highest level of objectivity expected of scholars, i.e. using reliable data and empirical facts to not taking a favorable stand on an Afro-centric posture runs the risk of alienating some segments of the white student body who feel uncomfortable discussing the difference race makes in America and may perceive such an essentialist perspective as “white bashing.” This presentation analyzes how the presenter has navigated the difficult terrain of the “Browning of America,” “white skin privileges,” the demystification of the dominant group’s perception of “equal opportunity,” and the hidden notion behind the concept of meritocracy.

WOMEN WITH CHILDREN AND COLLEGE DEGREES

Dr. Kingsley Banya & Maria Williamson (Student)
Misericordia University

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Dr. Kingsley Banya

ABSTRACT

At Misericordia University in Dallas, Pennsylvania, there exists a program designed to aid single mothers in achieving a higher level education. This Women with Children program awards merit-based and need-based scholarships, provides safe and comfortable housing, as well as exposes single mothers to a vast array of opportunities that they may not have received on their own. However, even though this program does a remarkable job at fund raising for these students and providing a safe environment for their children, the graduation rate among these women is not at 100%. This case study aims to examine the factors that have contributed to the success of those women, as well as the factors that seem to work against them. In doing so, we may be able to understand on a larger scale how poverty, single-parenting, and other economic factors affect the ability for women to attain a Bachelor's degree in Northeast Pennsylvania.

SUSTAINING THE EARTH AND LIVING THE DAO

Hong Miao
Marywood University

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Hong Miao

ABSTRACT

We live in a consumerist society where personal wellbeing and happiness depends to a very large extent on the level of personal consumption, particularly on the purchase of material goods. People have been directed to adhere to the values of a consumerist culture that position humans as ecologically superior, and thus leading them to view nature as a vast bank of commodities that humans are allowed to expend. To prevent increasing environmental devastation and to sustain the Earth educators need to cultivate students' innate ability to care for and protect nature and to live responsibly on the planet. Daoist philosophy places human beings as one element in the universe, forming intrinsic relationship with all that exists. Dao is the harmony of all that happens in the universe. All beings are interdependent and mutually arising (Allan Watts, 1977). The presenter will explore the ecological legacy of Daoism and discuss its implications to fostering sustainability.

EXPANDED RESULTS FOR THE RETRIEVAL PROTEIN STRUCTURES RELEVANT TO A DISEASE QUERY

*Dr. Paul J. DePietro, Elchin S. Julfayev, Ryan J. McLaughlin, Dr. William A. McLaughlin
The Commonwealth Medical College*

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Dr. Paul J. DePietro

Elchin S. Julfayev

Ryan J. McLaughlin

Dr. William A. McLaughlin

ABSTRACT

The KB-Rank tool is used to retrieve protein structures relevant to a given disease, and the tool is available on the web at the URLs <<http://protein.tcmedc.org/KB-Rank/>> and <http://sbkb.org>. In the current study, collaborative efforts were expanded to include additional information from biomedical databases that house annotations regarding the protein-disease associations. The integration of protein functional attributes was also expanded to contain post-translational modifications of proteins. With these additions in hand, protein structures relevant to a disease are retrieved and ranked according to their estimated relevance to a user-defined disease query. An application of a search is to identify protein structures that are highly relevant a specified disease. These protein structures may serve as targets for drug design strategies aimed to treat the disease. The searches also rank categories of protein functions associated with the query. These categories include the relevant drugs that may be studied to treat the disease in question. This work was supported in part by a general funds provided by The Commonwealth Medical College and by a sub-contract of the PSI Structural Biology Knowledgebase from the National Institute of General Medical Sciences (U01 GM093324).

AFAP1: AN IMPORTANT PLAYER IN BONE GROWTH?

*Dr. John A. Arnott, Dr. Jess Cunnick, Dr. Young Jin Cho, & Dr. Sonia Planey
The Commonwealth Medical College*



Dr. John A. Arnott



Dr. Jess Cunnick

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Dr. Sonia Planey

ABSTRACT

AFAP1 (Actin Filament-Associated Protein 110) is a member of a family of 3 proteins, which include AFAP-110/AFAP1, XB130/AFAP1L2 and AFAP1L1. AFAP1 was originally discovered as a SH3/SH2 binding partner of activated Src and has subsequently been shown to play a role in Src activation. AFAP1 has also been implicated as a cytoskeletal binding protein and its expression levels in certain cancers may be predictive of cancer progression and/or tumorigenic growth. However, the potential role of AFAP1 in other cellular processes or biological functions remains largely undetermined. In this study, we demonstrate a novel role for AFAP1 in osteoblast differentiation and bone growth. We demonstrate that AFAP1 null mice have low bone mass and that osteoblasts cultured from these mice display impaired growth. We also demonstrate that AFAP1 is expressed in osteoblasts at all stages of osteoblast differentiation (from the proliferative through mineralization stages) and that AFAP1 expression in these cultures can be induced by the bone growth factor TGF- β 1. In osteoblasts, AFAP1 binds to Src in a TGF- β 1 inducible manner and AFAP1 is required for Src activation. Further, when we blocking AFAP1 expression in osteoblasts using AFAP1 specific siRNA inhibits induction of the anabolic bone growth protein CCN2 by TGF- β 1 at the promoter and protein level. Taken together these data demonstrate that AFAP1 plays a role in osteoblast growth/survival and is an essential signaling effector upstream of Src for CCN2 induction by TGF- β 1 in osteoblasts.

FACULTY FROM MARYWOOD UNIVERSITY, THE COMMONWEALTH MEDICAL COLLEGE AND THE UNIVERSITY OF SCRANTON COLLABORATE TO DEVELOP AND INTERPROFESSIONAL EDUCATION CURRICULUM USING SIMULATION

Karen Arscott (TCMC), Colleen Heckman (US), Debbie Zielinski (US), Deirdre Spelman (MU), Diane Haleen (MU), Lisa Mattei (MU), Antonio Pellegrino (TCMC), John Szarek (TCMC), Mary Triano (TCMC), Wendy Manetti (US)



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ABSTRACT

A common source for medical error is ineffective communication among members of the healthcare team. Although evidence suggests that interprofessional education (IPE) improves health outcomes, teaching present and future healthcare professionals new skills and ways of relating to each other remains a challenge. In this project, we describe a grass-roots effort by faculty and professional staff from Marywood University, The Commonwealth Medical College, and the University of Scranton to develop the curriculum for improving communication skills among health professions students. Faculty and professional staff worked together to develop an IPE pilot experience for nursing, physician assistant, social work, and medicine students. Since simulation models real world practice, our goal was to develop a curriculum culminating in an IPE scenario in which students work together at the patient's bedside using a high fidelity simulator. Competencies were adopted from the IPE Core Competencies document for the simulation intervention. Instruments were created or adopted to collect data to measure student perceptions of the experience. After the pilot, analysis and dissemination of the findings and development of an implementation plan for the schools is planned. We believe this curriculum will serve as a foundation for interprofessional education.

ROLE OF ACTIN FILAMENT ASSOCIATED PROTEIN 1 AND C-SRC KINASE IN LIPOGENESIS AND FAT METABOLISM

Dr. Jess Cunnick, Dr. Young Jin Cho, & Stephanie Kim (Student)
The Commonwealth Medical College



Dr. Jess Cunnick

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Dr. Young Jin Cho

ABSTRACT

The c-Src tyrosine kinase contributes to many important physiological and pathological processes. Actin filament associated protein 1 (AFAP1) is an actin filament associated adaptor protein that is a binding partner for c-Src kinase. AFAP1 regulates the activity of this kinase by disrupting inhibitory intramolecular interactions. To investigate the physiological function of AFAP1 and its role in regulating c-Src kinase, we generated knockout mice in which the AFAP1 gene product was deleted from both alleles in all tissues and discovered that these female mice had a deficit in lactation. The loss of AFAP1 resulted in a defect in milk lipid secretion, marked by the accumulation of large cytoplasmic lipid droplets in the lactating mammary gland. These data mirror the phenotype seen in the female c-Src knockout mouse. We also observed, that in mice deficient for the AFAP1 protein, the activity of c-Src kinase in the mammary gland was reduced during pregnancy and lactation. Furthermore, lipid accumulation was observed in other lipogenic tissues. Livers from both male and female AFAP1 knockout mice demonstrated fat accumulation resembling that observed in human pathologies of nonalcoholic fatty liver disease. Taken together, these data suggest that AFAP1 plays an important role as a regulator of c-Src kinase in lipogenic tissues and in regulating fat metabolism.

SPIRITUALITY AND MEDICINE

*Claire Werner (Student)
Marywood University*

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Claire Werner

ABSTRACT

The professional field of medicine is arguably one of the most controversial aspects of United States culture. Differing opinions on Obamacare, abortion, informed consent etc, are all bioethical issues that have kept the nation at odds with itself. Surrounding all of these issues is an underlying dispute over spirituality and medicine. Strong religious beliefs, or lack thereof, have become the seeds of differing opinions about how to handle certain ethical issues in medicine. It has become increasingly evident that patients wish to engage in religious dialogue with their healthcare providers, yet the majority of medical professionals fail to meet this need. Other issues that stem from this problem are how to approach spirituality among believing and non-believing patients, how to utilize hospital chaplains, and training physicians-to-be about spirituality and medicine. This display hopes to provide information on the importance of engaging in religious dialogue with patients that have ethical concerns about their healthcare decisions.

A PROPOSAL FOR VERTICAL URBAN FARMING IN NORTH-EAST PENNSYLVANIA USING VACANT CITY-CENTER MULTI-STORY BUILDINGS

Dr. Steve Howell & Megan Marhnak (Student)
Keystone College

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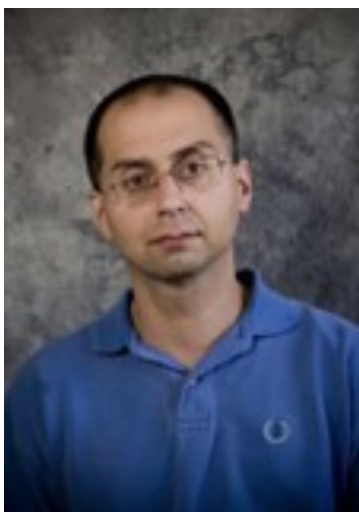
Dr. Steve Howell

ABSTRACT

There has been a great deal of interest growing over the last 10 years in the concept of urban farming. In sprawling cities of millions of inhabitants, the idea of growing fresh fruits and vegetables, or even fish and livestock, in vertical skyscraper farms can be cost-effective, as it provides employment for rapidly urbanizing populations, minimizes fertilizer and pesticide use, reduces harmful agricultural runoff and reduces transportation costs of imported food (Despommier, 2010). In North-East Pennsylvania (NEPA), while the cities are nowhere near this size, the city centers do have a surplus of unused, under-taxed real estate in older multi-story buildings and an under-employed work force. I propose that some of these vacant buildings could be converted to support hydroponic urban farming, providing jobs and tax revenue for depressed city centers, along with locally-grown inexpensive fresh food. Furthermore, while most designs for urban farming focus on technological automation which reduces running costs but drastically increases start-up costs, NEPA has the industrial and agricultural workforce already to operate such vertical farms without costly automation, producing more local jobs than an automated design and reducing capital costs.

CBP/P300 ACTIVITY AND BUTYRATE MODULATION OF WNT ACTIVITY IN COLORECTAL CANCER CELLS

Dr. Michael Bordonaro
The Commonwealth Medical College



Dr. Michael Bordonaro

ABSTRACT

Mutation of the Wnt signalin pathway is responsible for initiating most cases of colorectal cancer (CRC), and we have shown that hyperactivation of this pathway by histone deacetylase inhibitors (HDACis) such as butyrate, a fermentation product of dietary fiber, induces CRC cell death. Association between beta-catenin and the transcriptional coactivators CREB binding protein (CBP) and p300 influences Wnt signaling and colonic cell physiology. The small molecule inhibitor ICG-001 represses CBP-dependent Wnt signaling; further, ICG-001 has been shown to have anti-cancer activity *in vitro* and *in vivo*. We hypothesize that modulation of CBP-Wnt and p300-Wnt activity would significantly modify the ability of butyrate to enhance Wnt signaling and promote CRC cell death. Our findings suggest that CBP/p300-mediated Wnt signaling is required for the upregulation of Wnt activity of butyrate. Further, the ability of butyrate to increase the proportion of CRC cells with higher levels of Wnt signaling was completely obrogated by ICG-001. Importantly, combinatorial treatment of CRC cells with ICG-001 and butyrate resulted in cell type-specific effects on cell death. The findings generated from this study may lead to approaches to modulate the action of CBP/p300-Wnt signaling transcriptional programs in CRC, for therapeutic or chemopreventive effect.

LATERAL FEMORAL CUTANEOUS NEURITIS SECONDARY TO HIP SPRAIN IN A 21 YEAR-OLD COLLEGIATE FOOTBALL PLAYER

*Gregory K. Janik & Luke Beermann (Student)
Kings College*



Gregory K. Janik

ABSTRACT

Lateral femoral cutaneous neuropathy, or meralgia paresthetica, has an incidence rate of 4.3 of 10,000 people per year. The most common mechanisms of meralgia paresthetica include complications of surgical procedures, obesity, or other compressive mechanical factors. This case was unique due to the traumatic nature of the mechanism and the severity of pain with which the patient presented would often indicate a fracture. Conservative treatment was effective in the rehabilitation of a lateral femoral cutaneous neuropathy in this case. Medical professionals should be aware that nerve injuries may occur secondary to hip or back sprains but can also present with fracture like symptoms.

DETERMINATION OF THE OPTIMAL TIME AND DISTANCE OF ULTRAVIOLET EXPOSURE TO INDUCE THYMINE DIMERS

Vicki Stanavitch, Amanda Mathis (Student), Argit Marishta (Student)
Keystone College

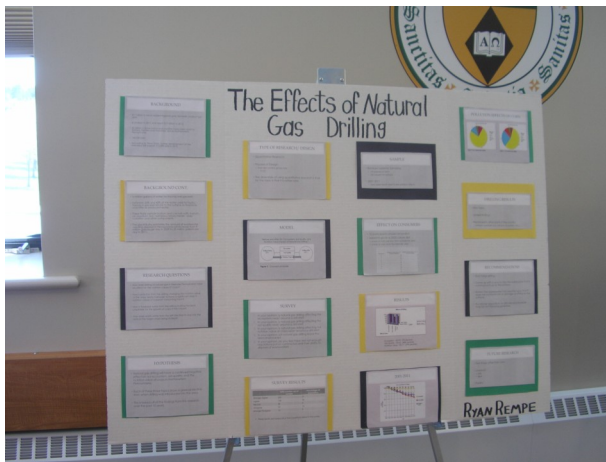
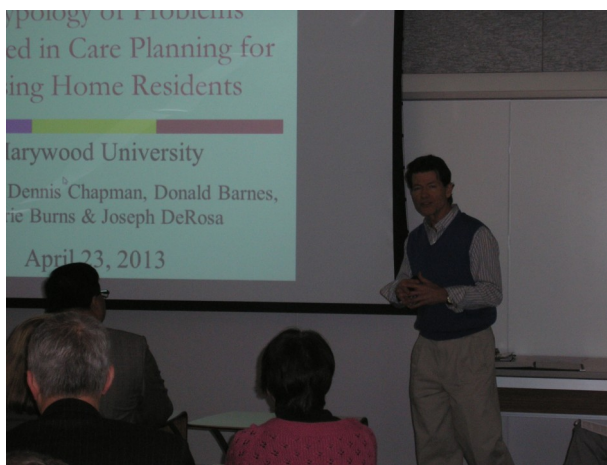
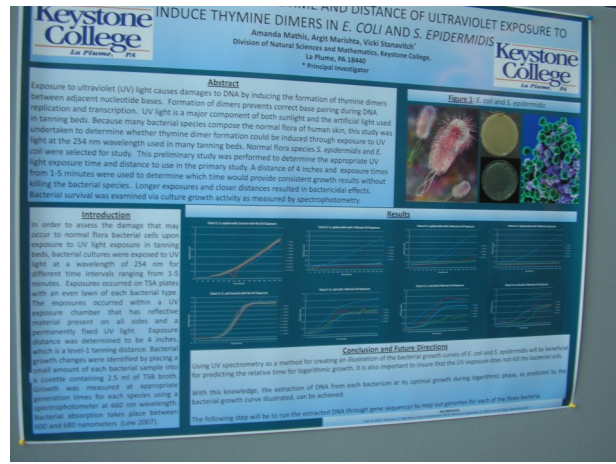


Vicki Stanavitch

ABSTRACT

Exposure to ultraviolet (UV) light causes damages to DNA by inducing the formation of thymine dimers between adjacent nucleotide bases. Formation of dimers prevents correct base pairing during DNA replication and transcription. UV light is a major component of both sunlight and the artificial light used in tanning beds. Because many bacterial species compose the normal flora of human skin, this study was undertaken to determine whether thymine dimer formation could be induced through exposure to UV light at the 260 nm wavelength used in many tanning beds. Normal flora species *S. epidermidis* and *E. coli* were selected for study. This preliminary study was performed to determine the appropriate UV light exposure time and distance to use in the primary study. A distance of 11 cm and an exposure time of 6 minutes were determined to provide consistent growth results without killing the bacterial species. Longer exposures and closer distances resulted in bactericidal effects. Bacterial survival was examined via culture growth activity as measured by spectrophotometry.

POSTERS & RESENTATIONS



A SPECIAL THANKS

The Academic Advisory Council (AAC) of the Institute for Public Policy & Economic Development would like to extend its gratitude to The Commonwealth Medical College for hosting this year's annual event.

The AAC would also like congratulate all the faculty and students whose hard work made the 2013 Faculty Symposium a success!

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