Proceedings Student Research and Creative Endeavor Symposium

Office of Research &. External Support

Follow this and additional works at: http://opus.ipfw.edu/stu_symp2004

Recommended Citation

This Presentation is brought to you for free and open access by the IPFW Student Research and Creative Endeavor Symposium at Opus: Research & Creativity at IPFW. It has been accepted for inclusion in 2004 IPFW Student Research and Creative Endeavor Symposium by an authorized administrator of Opus: Research & Creativity at IPFW. For more information, please contact admin@lib.ipfw.edu.
PROCEEDINGS

Student Research and Creative Endeavor Symposium

April 13, 2004

Walb Memorial Union

Indiana University-Purdue University Fort Wayne
Welcome to the seventh Annual Student Research and Creative Endeavor Symposium. It is with great pride that the Office of Research and External Support sponsors this Symposium. Student research is an extremely valuable part of the student experience at IPFW. In order to advance opportunities for student-centered research, ORES also sponsors the Undergraduate Student Summer Research Support Fund, the Supplies and Expenses Minigrant Program, and student travel to present results of research at regional and national professional conferences.

In addition to the many IPFW students participating, I am pleased to welcome students from Huntington College. Collegial interaction among students from the various colleges and universities of northeast Indiana provides an exciting opportunity to expand and enrich the experience of presenting original research.

I invite all IPFW undergraduate students to submit an application for the Pulin Sampat Memorial Undergraduate Research Award. This award, given annually to an outstanding undergraduate researcher, honors the memory of former IPFW student Pulin Sampat.

Finally, I offer a special thank you to the numerous faculty sponsors who have guided the research being presented today. Because they understand that learning is best achieved through active participation in research in the discipline, the experiences they provide are essential to the core mission of the University.

Best wishes,

Carl N. Drummond
Assistant Vice Chancellor for Research and External Support
IPFW Student Research Symposium April 13, 2004

Schedule of Talks

Walb Union Room 222

9:00 Fatema Majid  Effects of chronic temperature stress on zebrafish, *Danio rerio*
9:20 Christopher Dunn  A Genetic Algorithm for the Computation of Network Survivability
9:40 Reneé E. Centers  Characteristics of Boys' and Girls' Toys
10:00 Loralee Geiger  Gender Differences in Feelings of Personal Safety and Implicit Associations of Night and Danger
10:20 Melanie Bush  Effects of Berry Extracts on Immune System Function and Prostate Cancer Cells
10:40 Break
11:00 Eric L. Garcia  Genetically-Engineered Amino Acid Substitutions in the Carboxy-Terminal End of Threonine Dehydratase/Deaminase of *Arabidopsis thaliana* Reveal a Synergistic Interaction Between Two Different Effector-Binding Sites
11:20 Shelly A. Deck  A Trifluoroleucine-Resistant Mutant of *Arabidopsis thaliana* Overproduces Free Levels of the Essential Amino Acid Leucine
11:40 Chris Zollinger  Comparing Natural wetland soils with Anthropogenic wetland soils in NE Indiana
12:00 David W. Hatcher  Gender Differences in Spatial Memory and Manipulation
Walb Union 224

9:00  Dawn M. Bale  Use of Scent Dogs to Detect the Emerald Ash Borer

9:40  Shelly A. Deck and John Shannon  Site-Directed Mutagenesis in the Allosteric Region of Isopropylmalate Synthase of *Arabidopsis thaliana* for the Desensitization of Leucine Feedback Control

10:00  Yun Tan  Confidence Interval for a Population Median
10:20  Break
10:40  Derek Garcia  Calcein Blue as a Fluorescent Probe for Metal
11:00  Charles F. Gabet  Trace Metal Content in Roasted Coffee
11:20  Michael Sherrill, Timothy Keefe and Fatema Majid  Stress Proteins in Aquatic Organisms: An Environmental Perspective
<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Patricia M. Dowdell</td>
<td>James Smart Elementary School: A Catalyst For Change</td>
</tr>
<tr>
<td>9:20</td>
<td>G. Spencer Owen</td>
<td>Performance in Organizational Cultures: A New Look at Car Salesmen</td>
</tr>
<tr>
<td>9:40</td>
<td>Susan Guilkey</td>
<td>The Effects of a Classical Style of Management on Female Communication</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:20</td>
<td>Frederika Shawgo</td>
<td>Digital Animation-Publishing Project</td>
</tr>
<tr>
<td>10:40</td>
<td>John M. Riggle</td>
<td>Touchdown for History: Teaching History Using the History of Football</td>
</tr>
<tr>
<td>11:00</td>
<td>M. Patty Butz</td>
<td>Title IX: Friend or Foe to Gender Equality</td>
</tr>
<tr>
<td>11:20</td>
<td>Stephen O. Antrim</td>
<td>Native Populations of the Americas</td>
</tr>
</tbody>
</table>
Walb Union Room 116

9:00  Ryan G. Baird          The United Kingdom: Interest Rates, the E. U. and the Future
9:20  Mpelo Ndamba          Germany
9:40  David Hanley, Laura Loose, Brian Raub and Sharon Johnson
     Globalization: Economic Implications for Women in the United States
10:00 Miguel Bundi, Justin Markley, Ben Neighbors and Jacob Schnaitman
     The Wage Gap: Trends and Economic Consequences in the United States
10:20 Break
10:40 Brent Caffee, Noelma Gomes, Josh Rupnow and Massoxi Van-Dunem
     The Role of Women in Global Politics
11:00 Andy Goller and Betzy Goller
     Scholarship, Education, and Service: 2003 Healthy Cities Health Fair
11:20 April Bird, Crystal Everage and Tangeray Martin
     Dentifrice Associated Slough
Native Populations of the Americas
Stephen O. Antrim
Dr. Pamela Gray
School of Education, Elementary Education
Indiana University-Purdue University at Fort Wayne

A Social Studies Lesson Plan Designed for a Second Grade Classroom in New Haven Elementary School, New Haven, Indiana.

Goal: The goal of the lesson plan is to introduce and instill multicultural respect for the ancient Native Americans in second grade students.

The topic takes the broader form of native populations in the Americas with virtually unlimited variations on the theme. To create a focal point on the native populations, construct a large map of both continents without the use of man made territorial boundaries. In small groups, give the students the tasks of researching a Native Nation and choosing an image/symbol of the Nation to place on the map in its appropriate location. You should follow-up with a writing task to show them what they will learn about native culture.

Procedure:
1. While focusing the student’s attention to North and South America, ask the students for ideas leading to where and how Native Americans came to these lands. Simple answer is to explain that natives where here for at least 15,000 years before Columbus in 1492. What activities were the Natives engaged in through that 15,000 years span?
2. Continue to inquire into the paths Natives would have taken through these lands. From here forward, design inquiry based questions that address your student grade appropriate level to fit your curriculum. Please use the references in this lesson plan, as there is a huge database of excellent material.

The time frame of the lesson has no boundaries. It has the potential for a one day mini-lesson, or a full semester, one-day-per-week curriculum plan.
The United Kingdom: Interest Rates, the E. U. and the Future
Ryan G. Baird
Dr. Carolyn Stumph
Economics
Indiana University-Purdue University Fort Wayne

The United Kingdom (UK) is the world's fourth largest trading nation; birthplace of Newton, Darwin, Shakespeare and the Beatles; home of the world's largest foreign exchange market. The UK is considered by many to be Europe's leading business center, while the City of London has long been the European Union's financial center. "Political, economic and social stability in the UK has fostered the skills and productivity of the private sector to ensure continued growth and low inflation since the global recession of 1990-92." ¹

This paper will examine the UK's economic relationship with the European Union and the effects of the UK's decision to be the first country in the world to raise interest rates after the afore mentioned global recession. Using capital flows and the balance of payments the effect that this interest rate change will have on the British economy will be determined. Also it will be determined how the effect of the UK's problems with road congestion and overall transportation efficiency will affect the economy and its economic relationship with the EU. And finally, whether or not the UK's joining of the customs union of the EU was and is beneficial to the UK as well as whether or not they should join the monetary union of the EU.

1. 10 Downing Street. The United Kingdom Economy. 2003.
Use of Scent Dogs to Detect the Emerald Ash Borer
Dawn M. Bale
Dr. James Haddock
Biology
Indiana University-Purdue University Fort Wayne

The Emerald Ash Borer (Agrilus planipennis) is a non-native, invasive wood-boring beetle believed to have been introduced into Michigan through wood packing material from Asia. The beetle larvae feed in a serpentine motion in the cambial tissues of ash (Fraxinus ssp.) resulting in 100% fatality of infested trees within two years. The ash is a common tree used in metropolitan street plantings and the resulting devastation caused by the Emerald Ash Borer has already caused millions of dollars of losses to communities, nurseries, and the forestry industry. Early detection of the beetle is vital to prevent further spread of infestation to healthy trees. The use of scent-discriminating dogs to detect infestations before a tree exhibits signs of decline could provide a significant reduction in the loss of the ash tree population and may be an non-invasive, efficient and economically feasible method to locate infested trees in both urban and rural environments.
Dentifrice Associated Slough
April Bird, Crystal Everage, Tangeray Martin
Nancy K. Mann
Dental Education
Indiana University-Purdue University Fort Wayne

Purpose: Dentifrice associated slough is a condition associated with the use of several different types of toothpaste. It is an asymptomatic, superficial peeling of the oral mucosa. A pilot study was conducted to determine what brands or types of toothpaste or what particular ingredient in the toothpaste may be responsible for this sloughing. The study also helped identify products available for those who suffer from dentifrice associated slough, and the possibility of sloughing leading to more serious problems.

Methods: The pilot group consisted of a small convenience sample of two dental hygiene students, both sufferers of dentifrice associated slough. Each participant used a different type of toothpaste, both ADA and non-ADA approved, every 48 hours and recorded any results. The results were recorded from a range of no sloughing to severe sloughing. Overall fifteen different brand or types of toothpaste were tested. Both participants were also asked to write down any type of parafunctional activity that the sloughing may be causing, such as lip and cheek biting, to determine the possibility of more serious problems.

Results: The results of this study were determined by comparing the data presented by both participants. Both participants reported similar results for each brand or type of toothpaste. The results were then charted from least amount of sloughing to most in two separate charts for ADA and non-ADA approved dentifrice. Both participants also reported repeatedly chewing their cheeks and lips to remove the slough.

Conclusion: After comparing ingredients in all of the samples of toothpaste, the culprit seemed to be the foaming agent, sodium lauryl sulfate. By comparing the amount of sodium lauryl sulfate in each type of toothpaste with the sloughing chart, it was determined that as that sloughing increased, the amount of sodium lauryl sulfate also increased. By researching information about cheek and lip biting, it was determined that this can lead to hyperkeratinization, which with repeated exposure can become malignant. This study was conducted to provide an alternative for those who suffer from dentifrice associated slough. By switching to toothpaste with less sodium lauryl sulfate the participants were able to eliminate their sloughing problem. Further studies are needed with a more reliable sample size to determine the causes of dentifrice associated slough.
The gender wage gap is a statistical indicator often used as an index of the status of women's earnings relative to men's. The purpose of this paper is to explore trends in the gender wage gap, with a focus on the factors that cause the gap to increase or decrease. The gender wage gap has steadily decreased over the past few decades. We intend to answer questions such as what is causing the gender wage gap to decline and what are the economic consequences of this trend? We will examine the history of the wage gap in the United States, the current situation, as well as what might be expected in the future. Our examination will be informed by the influence of race/ethnicity and, possibly, class on the gender gap.
Effects of Berry Extracts on Immune System Function and Prostate Cancer Cells
Melanie Bush
Elliott Blumenthal
Biology
Indiana University-Purdue University Fort Wayne

The motivation for research with berry extracts resulted from the increasing interest in alternative medicines and their effectiveness in treating disease. This research contained several interactive elements and the objectives included: (1) determining if certain berry extracts (provided by the Artemis, Inc. Group) could increase the proliferation of healthy spleen cells (thus increasing the responsiveness of the immune system), (2) comparing the responses of young and old mice to determine if the berry extracts counteract the decrease in immune response with age, and (3) determining any effects of the berry extracts on the growth of a prostate cancer cell line.

Different concentrations of berry extracts were added in vitro to T lymphocyte spleen cells collected from lab mice. By the use of radioactive labeling and counting methods, the amount of spleen cell proliferation was measured. Analysis of the results demonstrated that proliferation was dose-dependent, but indeed promoted by certain berry extracts. I compared the proliferation responses of young (2 months old) and old (14 months old) mice. At certain concentrations, the older mice clearly showed greater proliferation stimulation by the berry extracts than did the younger mice. These results indicate that the decreasing immune response due to age can be significantly reduced by the berry extracts. Additionally, the berry extracts were added to prostate cancer cells and had significant morphological effects, resembling apoptosis as well as inhibiting tumor cell growth. Further experiments are currently under way to determine which biochemical pathway the berry extracts are killing the cancer cells. One potential biochemical pathway that is affected is the signal transduction pathway mediated by PKC. Western Blot analysis has confirmed that PKC levels in the cancer cells are decreased after treatment with certain berry extracts.
Title IX: Friend or Foe to Gender Equality
M. Patty Butz
Dr. Kathleen Murphy
School of Education
Indiana University-Purdue University Fort Wayne

Over thirty years ago, Senator Birch Bayh sponsored a federal statute (Title IX) to prohibit sex discrimination in our federally funded education programs. The far reaching effects of this statute are impacting individual lives on our campus today. On April 7, 2003 this statute was cited as a contributing factor in the decision to discontinue the men’s track and field team, while continuing the woman’s team. Compliance with this law touched the lives of twenty-nine student athletes in a profound and decisive way at Indiana Purdue Fort Wayne.

Last year alone, Title IX impacted over 2.5 million young females’ decisions in part directing the important life choice of which university to attend. For athletes, the choice to play or not to play defines more than their biceps because life virtually revolves around their sport and their practice schedule. Also, Title IX influences women’s health issues by contributing to a syndrome referred to as “the athletic triad.” As the United States faces an obesity epidemic, this statute is cited as a contributing factor in budget cuts resulting in decreases in physical education classes among high schools. In spite of the former secretary of Health and Human Services call to schools and universities to “reintroduce daily, quality, physical activity as a key component of comprehensive education,” the University of Toledo responded with the decision to eliminate loss of three athletic teams. In our nations’ quest for “equality” and the “perfect body,” the Title IX controversy has widened the gap in finding balance and satisfaction in the athletic opportunities offered by educational institutions.
The Role of Women in Global Politics
Brent Caffee, Noelma Gomes, Josh Rupnow, Massoxi Van-Dunem
Dr. Hedayeh Samavati
Department of Economics, School of Business and Management Sciences
Indiana University-Purdue University Fort Wayne

The purpose of this paper is to analyze the role of women in the global political arena. We will examine the effectiveness of females in the legislative process and discuss how gender differences play a role in the political process. We will then investigate the most common obstacles that women face as they enter the political arena. We will discuss if an increase in political education for women can enhance women’s participation in global political process. We are especially interested in studying whether improving women’s “political power” will result in an improvement in women’s economic standing worldwide.
Characteristics of Boys’ and Girls’ Toys
Renee E. Centers
Judith Elaine Blakemore
Psychology
Indiana University-Purdue University Fort Wayne

Many factors influence children’s gender development. One of these factors is the toys that are associated with boys and girls. While there have been a few studies on this topic, the characteristics and possible influence of children’s toys has not been studied extensively.

We did two studies looking at the characteristics of boys’ and girls’ toys. First, we established more than 20 categories of children’s toys (e.g., dolls, action figures, vehicles, sports items), and selected from one to five toys in each category, for a total of 126 toys. In Study One, these toys were rated by 300 undergraduates on a 9-point scale ranging from “this toy is only for boys” through “this toy is only for girls,” with a midpoint indicating that the toys were for both. The purpose of the first study was to identify five categories of toys: strongly masculine, moderately masculine, neutral, moderately feminine, and strongly feminine. We identified four sets of such toys, each with 15 toys, three of each of the categories.

In Study Two, these four “toysets,” each consisting of three toys of each category (e.g., strongly masculine, strongly feminine, etc.) were examined. Each of the toys was rated on 26 scales measuring such characteristics as: able to be manipulated, encourages creativity, encourages social play, involves construction, attractive, fun, expensive, artistic, scientific, musical, aggressive or violent, educational, dangerous, encourages nurturance, develops cognitive skill.

Each toyset (15 toys, 3 of each category) was rated by approximately 200 undergraduates on each of the 26 scales. At this point, data from only one of the toysets has been analyzed statistically, but by the time of the presentation, we hope to have examined all four toysets. Naturally, the findings are complex, but data analysis of the first toyset shows that girls’ and boys’ toys differ on almost all the scales, and that strongly feminine toys differ from moderately feminine toys, as do strongly and moderately masculine toys. Most notably, feminine toys are more likely to be seen as encouraging attractiveness, nurturance, domestic skill, and social play with others; masculine toys are more likely to be seen as violent or aggressive, involving construction, scientific, exciting, dangerous or risky; whereas neutral toys are more likely to be artistic and to develop physical skill.

I will present graphs of each of the scales (artistic, scientific, etc.) comparing the five categories of toys from each of the four toysets with each other.
A Trifluoroleucine-Resistant Mutant of *Arabidopsis thaliana*
Overproduces Free Levels of the Essential Amino Acid Leucine
Shelly A. Deck and Eric L. Garcia
George S. Mourad
Department of Biology
Indiana University-Purdue University Fort Wayne

Isopropylmalate Synthase (IPMS) is the first and key regulatory enzyme of the pathway for leucine biosynthesis in bacteria, yeast, fungi and plants. IPMS is subject to negative feedback control by the end product leucine. When leucine levels build up in the cell, it binds to IPMS at a regulatory site causing a conformational change that alters the catalytic site. This in turn results in inhibiting IPMS activity and slowing down leucine biosynthesis. A toxic analog of leucine, 5,5,5-trifluoro-D,L-leucine (TFL), inhibits cell growth by incorporating into cellular proteins during protein synthesis resulting in their destabilization leading to cell death. To isolate *Arabidopsis thaliana* mutants that overproduce leucine, we screened EMS-mutagenized populations of seed for germination and growth in the presence of wild type inhibiting levels of TFL. The strategy of the mutant selection is that a mutant plant could survive in the presence of TFL only if they contain a mutation in the gene encoding IPMS which would result in loss or reduction of leucine negative feedback control. Such TFL-resistant plants would overproduce leucine above normal levels, and this excess of free leucine outcompetes TFL for incorporation into cellular proteins. We have isolated two TFL-resistant mutant plants and have shown that TFL resistance is inherited to the progeny of such mutants. High Performance Liquid Chromatography on extracts from the two mutant lines revealed free leucine overproduction in one of the lines.
Site-Directed Mutagenesis in the Allosteric Region of Isopropylmalate Synthase of *Arabidopsis thaliana* for the Desensitization of Leucine Feedback Control

Shelly A. Deck and John Shannon
George S. Mourad
Department of Biology
Indiana University-Purdue University Fort Wayne

Our lab has previously isolated, sequenced, and characterized the expression patterns of a four-member small gene family encoding isopropylmalate synthase (IPMS) of *Arabidopsis thaliana* (Junk and Mourad, 2002). Of the four genes encoding IPMS, we previously determined that IMS-2 is the housekeeping gene maintaining IPMS activity in *A. thaliana* (Junk and Mourad, 2002). IPMS, whose amino acid sequence is highly conserved among yeast, bacteria, fungi and plants, is subject to negative feedback control by its end product leucine. To design point mutations in IMS-2 that would result in feedback insensitive IPMS, we identified consensus allosteric regions by aligning our *A. thaliana* IPMS with similar sequences from bacteria and yeast. We then designed oligonucleotide mutagenic primers to introduce specific base substitutions that would result in amino acid substitutions in the IPMS allosteric region. This was done using site-directed mutagenesis. Two such amino acid substitutions were designed in IPMS, and the mutant IMS-2 genes were subsequently spliced in front of the CaMV 35S promoter and engineered into *Arabidopsis thaliana* wild-type plants. Analysis of the two engineered *A. thaliana* lines is under way for loss of feedback sensitivity to leucine and for the overproduction of free leucine. Such new mutant IMS-2 alleles would provide new selectable markers for genetic engineering and could also be used for enhancing the nutritional value of plants.

James Smart Elementary School: A Catalyst For Change
Patricia M. Dowdell
Dr. Kathleen Murphy
School of Education
Indiana University–Purdue University Fort Wayne

As a first grade student at James Smart Elementary School during the 1969 – 70 school year, I was totally oblivious to the controversy surrounding this school and other predominately Black inner city elementary schools. During this turbulent time in Fort Wayne’s history, James Smart Elementary School played a key role in acting as catalyst in changing the make up of Fort Wayne Community School’s elementary schools. This paper takes a look back at the role James Smart Elementary School played in the desegregation of Fort Wayne Community Schools. It also looks at who the pioneer players were in the early stages of the desegregation process, as well as the school boycott of 1969.
A Genetic Algorithm for the Computation of Network Survivability
Christopher Dunn
Robert L. Sedlmeyer
Department of Computer Science
Indiana University-Purdue University Fort Wayne

Consider a network of computational nodes in which the topology and total computational workload are fixed. Each node is prone to failure, and the probability of failure is proportional to the workload assigned. We are interested in determining how to partition the workload among nodes to maximize network survivability. Survivability is defined as the probability that the network achieves its desired total computational workload in the presence of one or more node failures. We offer a graph-theoretic definition of survivability, discuss the computational complexity of maximizing survivability, derive a genetic algorithm for partitioning the total workload, and present experimental results.
Trace Metal Content in Roasted Coffee
Charles F. Gabet
Michael R. Columbia
Chemistry
Indiana University-Purdue University Fort Wayne

The trace metal content of unroasted coffee beans has been used to identify their country of origin. We are currently exploring the possible use of roasted coffee beans to perform the same identification. Preliminary results have indicated that the degree of roasting influences the extractable quantity of trace metals in the roasted coffee beans. To better understand this, we have explored the relationship between the amount of total mass lost during roasting and the concentration of various metals extracted into the brewed coffee. We have used atomic absorption spectrometry to study this relationship and present our results in light of the goal of identifying usable “fingerprint” elements to establish countries of origin.
This project was designed to determine if a linear relationship exists between the concentration of various divalent metal ions and a fluorescing agent called Calcein Blue. This was tested with fluorescent lifetimes because they are independent of the fluorescing agent’s concentration. We tested the metal ions Mg, Ca, Sr, Ba, Zn, Cd, Ni, and Cu.

We found no statistically significant shift in Calcein Blue’s lifetimes when Mg and Ca were added. Small shifts did occur when Sr, Ba, Zn or Cd were added, but these shifts did not show a linear dependence on metal concentration as we had hoped. When Ni and Cu were added to Calcein Blue fluorescence was quenched and no lifetime could be measured
Genetically-Engineered Amino Acid Substitutions in the Carboxy-Terminal End of Threonine Dehydratase/Deaminase of *Arabidopsis thaliana* Reveal a Synergistic Interaction Between Two Different Effector-Binding Sites

Eric L. Garcia  
George S. Mourad  
Department of Biology  
Indiana University-Purdue University Fort Wayne

We fused four mutant *omr1* alleles, encoding feedback-insensitive forms of *Arabidopsis thaliana* biosynthetic threonine dehydratase/deaminase (TD), to the CaMV 35S promoter and transformed these constructs into *A. thaliana* Columbia wild type plants. The mutant TD forms consisted of our previously isolated double mutant, *omr1-1*, and three new site-directed mutants, *omr1-5*, *omr1-7*, and *omr1-8* with single point mutations. We employed site-directed mutagenesis to assay the effects of amino acid substitutions in separate regulatory regions within the carboxy-terminal (C-term) allosteric end. TD assays and growth resistance to the isoleucine (Ile) toxic analog L-O-methylthreonine (OMT) confirmed the desensitization to feedback inhibition and the viability of these mutant *omr1* alleles as selectable markers, respectively. Two of the site-directed mutants, *omr1-5* and *omr1-7*, appeared to influence one of the two separate Ile-binding sites and had a notable 13-fold and 15-fold increase in free Ile, respectively. The *omr1-8* appeared to influence the other Ile-binding site and resulted in a 2-fold increase in free Ile. The transgenic *omr1-1* double mutant affecting both Ile-binding sites, however, displayed a 106-fold increase in free Ile revealing a profound synergistic interplay between these separate Ile-binding sites.
Evaluation of the *Arabidopsis thaliana* Mutant Forms of the Gene Encoding Isoleucine Feedback-Insensitive Threonine Dehydratase/Deaminase as a Novel, Environmentally-Friendly, Selectable Marker for Plant Transformation

Eric L. Garcia  
George S. Mourad  
Department of Biology  
Indiana University-Purdue University Fort Wayne

We have previously postulated that mutant alleles of the gene *OMR1* encoding feedback-insensitive forms of threonine dehydratase/deaminase (TD) could be used as a dominant selectable marker for plant transformation. Our lab has previously isolated a mutant *Arabidopsis thaliana* line GM11b which was due to a mutation (*omr1-1*) in the gene encoding the key regulatory enzyme of isoleucine biosynthesis. GM11b was selected for its ability to germinate and grown in the presence of the isoleucine toxic analog L-O-methylthreonine (OMT). This resistance was due to a 20-fold overproduction of free isoleucine that was produced by the feedback-insensitive TD encoded by *omr1-1*. The excess free isoleucine out-competed the toxic analog OMT for incorporation into proteins preventing their destabilization. To test the use of mutant *omr1* alleles encoding feedback insensitive TD forms as selectable markers, we spliced *omr1-1* isolated from GM11b and three newly designed site-directed mutant alleles *omr1-5, omr1-7,* and *omr1-8*, in front of the constitutively and highly expressed promoter CaMV 35S. All of the four vector constructs containing the *omr1* mutant alleles were separately engineered into *Arabidopsis thaliana* wild type plants. While all of the four *omr1* alleles conferred resistance to elevated concentrations of OMT, the progeny of *omr1-1* initial transformants, however, exhibited a bushy phenotype at the rosette stage which we attributed to the excessive levels of free isoleucine overproduction (106-fold). On the other hand, progeny of transformants *omr1-5, omr1-7,* and *omr1-8* had a normal phenotype, undistinguishable from wild type. Therefore, alleles *omr1-5, omr1-7,* and *omr1-8*, proved to be ideal as environmentally-friendly, dominant, selectable markers for plant transformation. We believe that *omr1-1* could provide a stringent selectable marker when driven by a tissue-specific or developmentally-regulated promoter.
Gender Differences in Feelings of Personal Safety and Implicit Associations of Night and Danger
Loralee Geiger
Carol Lawton
Psychology
Indiana University-Purdue University Fort Wayne

The purpose of this study was to examine gender differences in feelings of personal safety and whether they could be measured using the Implicit Association Test. The sample consisted of 423 (150 male and 273 female) undergraduate students. Participants completed an Implicit Association Test (IAT), which was presented on a computer. They were required to categorize pictures of day scenes and night scenes and words related to safety and danger into the superordinate categories of Day/Unafraid versus Night/Afraid (Consistent condition) and Day/Afraid versus Night/Unafraid (Inconsistent condition). Subsequently, participants answered questions regarding feelings of safety. As was expected, women reported feeling significantly less safe than did men. There was a significant difference in response times in the IAT between Consistent and Inconsistent conditions, with both women and men responding faster in the Consistent condition than in the Inconsistent condition. Response times for women in the IAT were greater between the two conditions than they were for men, which shows that women have a stronger association with danger and night than do men; the implicit and explicit measures were not found to be correlated.
The Indiana Healthy Cities project started in 1987, in seven select cities around the state. The Fort Wayne Healthy Cities Committee was established and oversees several community projects, one of which is an annual health fair for uninsured and underinsured adults. In November 2003, Healthy Cities Health Fair completed its 13th year of providing free health services, screenings, and referrals. A total of 800 individuals were served. In addition to health services, participants also received free winter clothing, personal hygiene items, haircuts, blankets, and lunch. This broad based, totally volunteer, community event is sponsored by many health and social service agencies, businesses, churches, local universities, and schools. Last year, $14,000 was raised from local foundations, unions, schools and individuals to purchase supplies and immunizations. Veterans’ Stand Down joined the Health Fair to reach homeless and low-income veterans. These veterans receive all the services available to the public, but in addition have access to Army surplus clothing, winter coats, and sleeping bags. This event has grown more popular over the years and offers an invaluable service to the community.

Student contributions to the project include a review of literature, adherence to Health Fair criteria as set by the well established planning board, delivery of care and services, collection of goods and items to be distributed, data collection on the day of the fair, data entry using SPSS, statistical analysis, as well as deriving implications for practice, education, and future research needs.

Findings from this scholarly project have been presented at a meeting of the local chapter of Sigma Theta Tau International Nursing Honor Society. Participant feedback on the presentation strategies will be considered in preparation for subsequent public presentations. This abstract has been accepted for poster presentation at the 2004 Indiana Public Health Association Annual Conference scheduled May 10-12th in West Lafayette, Indiana.
The Effects of a Classical Style of Management on Female Communication
Susan Guilkey
Kevin Miller
Communication Studies

This study was designed to interpret and analyze the effects that a classical style of management has upon the communication style of females in a medical setting. The study uses qualitative methods to examine this dynamic at Parkview Hospital in Huntington, IN. Both participant observations and interviews with both males and females within the organization are conducted to answer the research question, Does a classical style of management accommodate more to males that to females? Among other theorist, the work of Deborah Tannen on talk at work is used as a lens into the communication of the female employee at Parkview.
Globalization: Economic Implications for Women in the United States
David Hanley, Laura Loose, Brian Raub, Sharon Johnson
Hedayeh Samavati
Department of Economics, School of Business and Management Sciences
Indiana University-Purdue University Fort Wayne

This paper examines the effects of globalization on the economic position of women in the United States. Implications of globalization such as increased competition in the global marketplace which has led to "downsizing," cost-cutting, and outsourcing, will be studied. Labor market consequences of all these measures on economic position of the workforce in general, and women in particular, will be examined. In addition, we will investigate whether labor market effects of globalization are distributed evenly by gender and by race/ethnicity. It has been suggested in the current body of research that national assimilation into the world economy considerably increases the prospects for women in the workforce. However, a large proportion of newly created jobs are low-paying service jobs that do not require a high level of skill, most of which are held by women. We will investigate whether globalization will eliminate obstacles to women's progress in terms of reducing labor market segregation and improving the types of jobs that are available to women. Policy implications of our findings will be discussed in conclusion.
Gender Differences in Spatial Memory and Manipulation

David W. Hatcher
Carol A. Lawton
Department of Psychology
Indiana University-Purdue University Fort Wayne

Gender differences in performance on spatial memory and manipulation tasks were evaluated. Participants were 286 undergraduate students (212 female; 73 male). Two geometric shapes were presented in four conditions (15 trials each): both shapes superimposed over each other in the center of a computer screen (simultaneous-centered); one shape on the left side of the screen and the other on the right (simultaneous-offset); one shape on the left side followed by the other on the right (delayed-offset); and one shape in the center followed by the other in the center (delayed-centered). After being presented with the two shapes, participants were to select the combined shape that would result if the two shapes were superimposed on top of each other. Males were significantly more successful than females in choosing the correct combined shape in the delayed-centered and simultaneous-offset conditions. In addition, males performed all four of the tasks more rapidly than their female counterparts. The results indicate that males can manipulate objects across space and time more efficiently than females when the visual stimuli are presented either simultaneously at different locations or at the same location on a delayed schedule.
Effects of chronic temperature stress on zebrafish, *Danio rerio*

Fatema Majid
Ahmed Mustafa, Shree Dhawale, and Shrikrishna Dhawale

Biology
1. Indiana University-Purdue University, Fort Wayne and
2. Indiana University East, Richmond

Experiments were conducted to examine the effects of temperature stress on the physiology of Zebrafish, *Danio rerio*. Disease-free zebrafish were obtained from Scientific Hatcheries of Huntington Bach, California. Upon arrival, fish were acclimated and then divided into 3 experimental groups; control at 28°C, test 1 at 32°C, and test 2 at 23°C; each with 2 replicates. Water qualities were monitored on a regular basis and fish were taken care of according to the guidelines of the animal care protocol. Fish (10 per group) were sampled at a regular interval of 2 weeks (weeks 0, 2, 4, 6 and 8). At each sampling period, sampled fish were first checked for effects on length and weight and physiological changes (oxygen consumption and ventilation rates), and then were euthanized and dissected to obtain fish tissues for immunological (macrophage respiratory burst and phagocytosis) and cellular response (protein profiles). There were no significant differences in ventilation rates and oxygen consumptions among the fish groups. But fish in test groups had significantly lower levels of respiratory burst activities at weeks 2 and 6. There was no significant difference in length, but fish in both test groups had less weight as the experiment progressed suggesting that chronic temperature stress induces weight loss and affects immune response. (This research was funded by Indiana University Research and the University Graduate School).
Germany's affluent and technologically powerful economy turned in a relatively weak performance throughout much of the 1900s. The modernization and integration of the eastern German economy continues to be a costly long-term problem, with annual transfers from west to east amounting to roughly $70 billion. Germany's aging population, combined with high unemployment, has pushed social security outlays to a level exceeding contributions from workers. Structural rigidities in the labor market - including strict regulations on laying off workers and the setting of wages on a national basis - have made unemployment a chronic problem. Business and income tax cuts introduced in 2001 did not spare Germany from the impact of the downturn in international trade, and domestic demand faltered as unemployment began to rise. Growth in 2002 again fell short of 1%. Corporate restructuring and growing capital markets are setting the foundations that could allow Germany to meet the long-term challenges of European economic integration and globalization, particularly if labor market rigidities are addressed. In the short-run, however, the fall in government revenues and rise in expenditures have brought the deficit close to the European Union's 3% debt limit.
PULIN SAMPAT MEMORIAL UNDERGRADUATE RESEARCH AWARD

IPFW students who have conducted undergraduate research may be eligible for the annual Pulin Sampat Memorial Undergraduate Research Award.

A five-member panel of judges, comprised of four faculty members from four different schools within IPFW as well as one undergraduate judge selected by the International Students' Organization, will select the winner. The recipient of this award will receive a $250 prize and will be recognized at the IPFW Honors Convocation on October 3, 2004.

Following are the terms and conditions of the award:

1. The applicant must be an IPFW undergraduate at the time the research was conducted.
2. The research may be in any discipline and conducted with or without the supervision of an IPFW faculty member, and in or not in an IPFW course.
3. The research may or may not have been published.
4. The applicant must be an IPFW undergraduate or a graduate who earned an undergraduate degree at IPFW within the past year.

The applicant must explain the nature and significance of the research in sufficient detail to enable the faculty and undergraduate judges in unrelated disciplines to evaluate it accurately.

**Deadline:**

Applications are available in the Office of Research & External Support, KT G78, and must be returned to that office by May 14, 2004.

For more information contact Carl Drummond, (260) 481-5750.