Undergraduate Research
University of Central Florida

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Director, Office of Undergraduate Research
Office of Undergraduate Research (OUR)

• Mission:
  – Strengthen and enrich the undergraduate research climate at UCF
  – www.OUR.ucf.edu
• **278** Honors in the Major students
  – *(Burnett Honors College)*
• **86** Research and Mentoring Program
• **37** McNair Scholars Program
• **129** Undergraduate Research Initiative
• **762** enrolled in independent research class
• **48** students participated in *NSF REU*
• **252** students presented at the *Showcase of Undergraduate Research Excellence*
What is Research at UCF?

• Inquiring to discover **NEW** information
• Slight Differences Between Disciplines*:
  – Sciences → Test predictions from hypotheses to generate **NEW** information
  – Humanities → Synthesis of knowledge to create **NEW** ideas
  – Fine Arts → Creation of **NEW** works and techniques from existing models

*This is not an inclusive list
Accounting
Actuarial Science
Advertising/PR
Aerospace Engineering
Animation
Anthropology
Art (various)
Biology
Biotechnology
Business Management
Chemistry
Civil Engineering
Comm Sciences & Disorders
Computer Engineering
Computer Science
Criminal Justice
Digital Media
Economics
Education (various)
Electrical Engineering
Elementary Education
English (Various)
Engineering Technology
Environmental Engineering
Event Management
Film
Forensic Science
French
Graphic Design
Health Information Mgmt
Health Sciences
Health Services Admin
History
Hospitality Management
Industrial Engineering
Information systems Technology
International Relations
Interdisciplinary Studies
Interpers/Organ Comm
Journalism
Legal Studies
Mathematics
Mechanical Engineering
Molecular Bio & Microbiology
Music (various)
Nursing
Philosophy
Physics
Political Science
Psychology
Radiologic Sciences
Radio/TV
Science Education
Social Work
Sociology
Spanish
Sports and Fitness
Studio Art
Theatre (various)
Examples of Projects:

– A Study in Scenic Design: Fish Eyes (Theater)

– Removal of Iron and Color from Industrial Wastewater with Coal Derived Fly Ash (Civil, Environmental, and Construction Engineering)

– The Role of Norepinephrine and Epinephrine in the Early Development of Embryonic Hearts (Biomedical Sciences)

– First Steps to Exploring mars: Extractions of Oxygen from Martian Soil (Chemistry)

– Prevalence of Traumatic Brain Injury in Post-Secondary Schools (Communication Sciences and Disorders)

– Latino Political Party Identification: Democrat or Republican? (Political Science)
WHY?

• Skills  (Kardash 2000, 2004; Bauer and Bennett 2003)
• Confidence  (Seymour et al. 2004)
• Career clarification  (Lopatto 2003; Seymour et al. 2004)
• Continuing education  (Nagda et al. 1998; Hathaway et al. 2002)
• Letters of recommendation
• Opportunity to expand resume
WHAT?
Summer Research Academy

- [www.SRA.ucf.edu](http://www.SRA.ucf.edu)
- Three day academy, June each year
- Transfer and current students
- 100 students participate each year
- SRA Scholars receive 1 credit
  - Work closely with a peer mentor already engaged in research (in a similar discipline)
  - Meet faculty and graduate students
  - Learn about programs at UCF
Programs

- **McNair**
  - TRIO program: U.S. Department of Education.
  - UCF is one of 180 institutions nationally selected to participate
- **Research and Mentoring Program (RAMP)**
- **Honors in the Major**
  - Not for Honors College students only
UCF Undergraduate Research Journal

- Showcase articles of exemplary research from a wide range of student scholarship in all fields

- Please visit the UCF URJ web site www.URJ.ucf.edu for:
  - Information
  - Submission guidelines
  - Current Issue
OUR Student Research Grant

– Funds independent research projects with faculty mentor support (Up to $500)
– Examples:
  • Where has the Revolution Gone? Gender & Politics in Contemporary Nicaragua
  • Reduce Surgical Site Infection Occurrences in the Operating Room
  • Adolescents' Perceptions of HPV Vaccination in the Context of Prevention, Risk, and Sexual Norms
# Travel Awards

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UCF Student Research Week

- March 29-April 1
- Workshops, panel discussions
- Graduate Forum, Showcase of Undergraduate Research Excellence
- LIFE is a sponsor!
- Researchweek.ucf.edu
Showcase of Undergraduate Research Excellence (SURE)

• www.showcase.ucf.edu
• Poster- or display-based forum
• Research/creative projects (all disciplines)
• 314 students presenting 230 projects
• April 1, 2010, 1:30-5 PM, please stop by!
• $13,000 awarded in scholarships
Showcase 1st Place Winners 2009

- Amber Dukes - *Attraction to Psychopaths*
  - Psychology and Interdisciplinary Studies
- Liz Haynes - *Anti-Cancer Treatments*
  - Molecular Biology and Microbiology
- Michael Napolitano, Jordan Munizzi and Trent McRae - *The Archaeological GIS of the Beni*
  - Anthropology
Attraction to Psychopaths…
and other research adventures

Amber Dukes
Research Question

- What, if any, variables might predict attraction to individuals with psychopathic traits?
Characteristics of Psychopaths

- Glib
- Charming
- Manipulative
- Impulsive
- Parasitic Lifestyle

- Disregard for Social Norms
- Rationalize Wrongdoings
- Grandiose
- Lack Empathy
- Lack Remorse

(Hare, 1993)
Mate Selection

- We desire those who we *perceive* to be similar to ourselves on attitudes, beliefs, and values (Klohnen & Mendelsohn, 1998)

- Evolutionary psychology posits that there are two predominant mating strategies: short & long term (Buss & Schmitt, 1993)
Mating & the Psychopath

• Leave a trail of “broken hearts, empty wallets, and shattered promises” in their wake. (Hare, 1993, p xi)
Devastation

- Emotional brainwashing
- Gaslighting
- Stockholm Syndrome

(Kirkman, 2005)
Common Themes

• the infliction of isolation and coercion
• making rules and instituting punishment
• emotional withholding
• character assassination

(Kirkman, 2005)
Psychological Abuse

- May be more detrimental to functioning than physical abuse

- Victims may internalize the faults, reducing self-esteem & self-efficacy

- Some abused women exhibit schizotypal patterns

(Perez-Tester, et al., 2007)
Importance of Research

- By identifying personality patterns in persons who are attracted to, but have not yet dated, a potential psychopath we may be able get a glimpse into the precursor of the “cycle” of abuse.
Method

- 587 undergraduate psychology majors from UCF (150 male, 437 female)

- Age range: 18 – 36

- Recruited using Sona-Systems and granted Sona credit for participation
Measures:

- Need for Affiliation
- Loneliness
- Psychopathy
- Family Cohesion
- Erotophilia
- Impulsivity
- Empathy
- Social Desirability
- Psychological Maltreatment
Results

- Multiple Regression:
  - High Need for Affiliation
  - High Psychopathy
  - Low Empathy
  - High Impulsivity
    - (all $p$s < .05).
Conclusion

- Results are consistent with reigning theories of mate selection
  - Individuals with similar levels of psychopathy and impulsivity find interest in one another
  - Individuals high in need for affiliation may be more likely to rely on short term mating
References


Awards

- 1st place Social Sciences, 2009 SURE

- Honors in Major/ College of Sciences Scholarship

- Psi Chi Research Award

- Presented at the 2010 Society for Personality and Social Psychology and Evolutionary Pre-conference in Las Vegas
Current Research

- Evolutionary Psychology
  - Assumption that Darwinian Natural Selection shaped the mind
  - Evolved to solve recurring problems in the Pleistocene environment
  - Counter to the “Blank Slate” theory
  - Uses Game Theory and cooperation to explain
Thank you!
Anti-Cancer Therapy: Lipopolyamines and Immunotoxins

By Elizabeth Haynes and Dr. Ken Teter
Cancer: What does it mean?

• Unchecked cell growth
  • Cells become “immortalized”
• Don’t perform normal functions
• Drain resources
Cancer: Targeting the Problem

- Rapidly growing cells
  - Starvation
  - Destroy essential structures
  - Prevent synthesis of genetic material
- Specific populations
  - Mark for immune response (opsonization)
  - Conjugate therapies
Cancer: Targeting the Problem

- Antibodies bind tightly to their antigen
- can be mass produced
- already used in therapeutics
Cancer: Eliminating the Problem

- Toxin derived from Soapwort plant
- Prevents protein synthesis
Putting it All Together

**Fig. 1** Generic examples of an Immunotoxin (ITx). The green structures represent the F(ab’) portion of the antibody, linked to the circular representation of toxin by a disulfide bond.

Low specificity/Toxicity.

Saporin, no binding domain.

High specificity/Toxicity.

Saporin Immunotoxin, F(ab’) binding domain.
Introduction: Hypothesis

- ITx selectively targets cells expressing specific antigens.
- Cancer cells display special antigens.
- ITx can target and kill cancer cells.
- ITx can cause non-specific damage:
  - “accidental” uptake by non-target cells.
  - Vascular Leak Syndrome (VLS).
- Hypothesis: a drug synthesized at UCF by Dr. Otto Phanstiel, when co-administered with ITx, will increase cancer cell death without having to increase the concentration of ITx used.
**Results: Target Cancer Cells are Sensitized**

Fig. 4 Cell survival in CD38 expressing Ramos cells after exposure to ITx lipopolyamine #1, #2, and #3. #1 used at 1ug/ml and #2 and #3 used at 3ug/ml.
Summary:

I. ITx treatment has been proven to be successful in curing mice of cancer (Dr. Flavell’s work).

II. ITx treatment has the drawback of non-specific toxicity (VLS).

III. We can avoid this by figuring out how to make a smaller amount of ITx more toxic.

IV. My data has shown significant promise in novel drugs co-administered with ITx to increase the toxicity of ITx.

V. Proven effective, but what is the mechanism of action?

VI. Future work: Basic, proof of principle research on why we see sensitization
Acknowledgements

The Teter Lab
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The American Cancer Society
Research and Mentoring Program (RAMP)
NCMR Scholars Program
The Beni

- Northeastern Department of Bolivia
  - second largest Department
  - but is also the second least populated
- Tropical, humid climate
- Large savanna covered by many rivers and lakes.
Previously considered too harsh to sustain a large human society in the Pre-Contact period.

From 900 BCE-1600 CE a sizeable group of pre-Columbian peoples was dynamically changing the Amazon landscape

Inhabitants created a culturally rich and diverse way of life.
  - built raised agricultural fields to protect crops from seasonal fires and flooding
  - inundated savannahs for water management, fishing purposes
Materials

- **Google Earth**
  - A free program that consists of a globe represented by aerial photos and satellite imagery.
  - Allows viewing and manipulation of a virtual globe
  - Allows landscape to be analyzed and digitized

- **ArcGIS**
  - Geographic Information Systems software
  - Allows for further data manipulation, editing, and analysis of digitized landscape
Methods

• Tools
  - “Polygon”
  - “Place mark”
  - “Path”

• User can zoom in and out to view landscape from varying distances
Methods

Digitizing process
Goals

• Digitize rainforests, burned areas, lakes, forest islands, and other physical features of the landscape

• Locate earthworks and signs of habitation.

• Create the first accurate digital maps of the area.

• Enrich the general and anthropological community’s knowledge of this remote part of the Amazon

• Encourage cross cultural dialogue
Archaeological GIS of the Beni

The Baure
Greater Accuracy

- Digitizing the landscape of the Beni (in Google Earth) and cross-referencing that information with the first hand accounts of Jesuit missionaries, has allowed for greater accuracy uncovering habitation sites.
New Applications

- Taking the same techniques used on the Beni (river) and applying those to two new major rivers (The Mamore) and the (Guapore) has allowed me to greater focus my attention and understand a special native group known as the Baure
The Baure

- The Baure are natives of the Mojos region of the Beni. They’re native Arawak speakers who occupied an area of great importance to European missionaries.
- They also presented the biggest problems for Europeans because they were also the most militaristic of all the surrounding peoples.
The Baure

• “The Jesuits considered the Baure the most civilized of the native populations and placed great emphasis on their conversion”
  - David Block “Mission Culture of the Upper Amazon” pp. 18

• “An important variant of this pattern appeared among the Baure, whose villages bore a distinctively martial countenance. Baure dwellings were surrounded by a palisade of sharpened logs and a deep moat crossed by a removable causeway”
  - David Block pp. 26
  (Speaking about native settlements and fortifications)
New Questions

- Who were the Baure and why were they so unique when compared to the neighboring villages?
- Did the European/Native cultural synthesis differ from contact in other places?
Conclusions

These are all questions that can be answered by excavation and the Archaeological GIS project of the Beni aids in answering these questions by optimizing digging efforts on the ground.