

2007

April 20  
Welch Hall  
11am-3pm

College  
of  
Natural Sciences

# Undergraduate Research Forum

THE UNIVERSITY OF TEXAS AT AUSTIN



Welcome to the 2007 College of Natural Sciences Undergraduate Research Forum. With over 140 undergraduate researchers presenting their work in both poster and oral sessions, this year's event demonstrates the breadth and quality of our undergraduate researchers and the outstanding faculty who mentor them. We are especially pleased to have so many research fellowship winners and academic honor students among the presenters.

As you peruse the program you will see student participation from every department in the College as well as the College of Engineering and the College of Liberal Arts. This work is done in labs both at UT and across the country. We hope that you will spend time visiting with the students to learn more about their projects and their experiences.

We are particularly indebted to our industrial partners who sponsored awards and volunteered the time of the many scientists and engineers who have agreed to serve as judges for the event. They have helped to make this an event of the highest caliber as we show off the tremendous talent evident in our undergraduate students.

Finally, I would like to thank the University Co-op for both their ongoing support of undergraduate research in the College and of the many wonderful student events that would not be possible without their generosity.

With all best wishes,

A handwritten signature in black ink, reading "Mary Ann Rankin". The signature is fluid and cursive, with a long horizontal stroke at the end.

Mary Ann Rankin, Dean  
College of Natural Sciences

# Research Showcase • Honors Theses and Featured Programs

## Oral Presentations

### Welch 2.304

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- 12:15     **Estrogen receptor  $\alpha$  expression in the median eminence: Localization on neurons and glia**  
Presenter: Mo Monita  
COLLEGE OF PHARMACY
- 12:35     **Bubble pinch-off in a Hele-Shaw cell**  
Presenter: Brooks Campbell  
DEPARTMENT OF PHYSICS
- 12:55     **The prevalence of *Staphylococcus aureus* and methicillin-resistant *Staphylococcus aureus* in a university setting**  
Presenter: Natalie Blum  
Texas Department of Public Health Internship  
SCHOOL OF BIOLOGICAL SCIENCES
- 1:15       **Single-molecule spectroscopic studies of conjugated polymers**  
Presenter: William Miller  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
- 1:35       **On composing parallel matrix multiply from kernels**  
Presenter: Bryan Marker  
DEPARTMENT OF COMPUTER SCIENCES
- 1:55       **A study of gain stability and charging effects in GEM foils**  
Presenter: Evan Kornaki  
DEPARTMENT OF PHYSICS
- 2:15       **The role of promoter divergence in nonadditive gene regulation in *Arabidopsis* allopolyploids**  
Presenter: Vikram Agarwal  
SCHOOL OF BIOLOGICAL SCIENCES
- 2:35       **Unravelling the violent histories of galaxies using independent methods**  
Presenters: Sarah Miller and Kyle Penner  
DEPARTMENT OF ASTRONOMY

## Welch 2.308

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- I2:I5 Effect of target duration and temporal uncertainty in a visual detection task**  
Presenter: Ryan Ash  
CENTER FOR PERCEPTUAL SYSTEMS, COLLEGE OF LIBERAL ARTS
- I2:35 Analysis of enteric parasites in refugees in Texas, 2000-2005**  
Presenter: Bethany Blackstone  
SCHOOL OF BIOLOGICAL SCIENCES  
Texas Department of Public Health Internship
- I2:55 Assessment of the catalytic activity of G4-NH<sub>2</sub> dendrimer-encapsulated mono- and bimetallic nanoparticles**  
Presenters: Sawyer Croley, Michael Gabay and Thao Nguyen  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY  
Freshman Research Initiative
- I:I5 Identification and characterization of a virulence-associated gene in *Shigella dysenteriae***  
Presenter: Keren Hilgendorf  
SCHOOL OF BIOLOGICAL SCIENCES
- I:35 Selection of aptamer sequence against LolC and Nogo**  
Presenters: Fan Fan Shen and Yuxuan Wang  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY  
Freshman Research Initiative
- I:55 Algorithms for rigorous lower bounds of topological entropy**  
Presenter: Rodrigo Trevino  
DEPARTMENT OF MATHEMATICS
- 2:I5 Detection of the Virulence Genes in Methicillin-Resistant *Staphylococcus aureus* (MRSA) by Polymerase Chain Reaction (PCR)**  
Presenter: Isaac Pan  
SCHOOL OF BIOLOGICAL SCIENCES  
Texas Department of Public Health Internship
- 2:35 Partner Selection Standards of Divorced Mothers**  
Presenter: Sarah Williams  
DEPARTMENT OF HUMAN ECOLOGY, DIVISION OF HUMAN DEVELOPMENT & FAMILY SCIENCES

# Freshman Research Initiative

## Stream Poster Presentations

The Freshman Research Initiative (FRI) is a new program in the College of Natural Sciences that incorporates authentic faculty research as a means of teaching large numbers of students on a timeline spanning their first two years at UT. This program has already involved over 400 freshmen in faculty research in Biology, Chemistry, and Computer Science. The core of this program is a year-long, potentially publishable research project that reflects the core interests of our faculty and fulfills degree requirements for the student. Students are members of a 30-student cohort – a Research Stream – in which they conduct independent, but parallel projects under the guidance of faculty, graduate students and peer mentors.

When fully implemented in five years, the UT-URC will impact 2,000 students annually.

**Nucleic acid selection: From sequence to therapeutics**

***Ellington Stream***

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

**Building the vertebrate and mammalian interactome maps**

***Stevens Stream***

SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

**Template-assisted synthesis of nanomaterials with catalysis applications**

***Stevenson, Vanden Bout and Crooks Stream***

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

**Mechanisms of protein synthesis initiation in plants**

***Browning Stream***

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

**Peptidic combinatorial colorimetric**

**sensors for wine analysis**

***Anslyn Stream***

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY, FRESHMAN RESEARCH INITIATIVE

**DARPA Urban Challenge - autonomous vehicles, driving in traffic**

***Stone Stream***

DEPARTMENT OF COMPUTER SCIENCES

**NERO 2.0: Neuro Evolving Robotic Operatives**

***Miikkulainen Stream***

DEPARTMENT OF COMPUTER SCIENCES,

**FRI Discovery Laboratory in Plant Biology: Investigations into**

**Extracellular Nucleotide Signaling**

***Roux Stream***

SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

# Poster Presentations

## *Alphabetical by Author*

### **Cloning and functional analysis of putative *Arabidopsis* apyrases**

Nisha Abraham SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

Stuart Reichler and Stanley Roux, SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

### ***Drosophila* eye development pathway**

Dominga Adames SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

### **Research Interest Poster**

### **UT microarray core facility**

Andrew Adey DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Eun Jeong Cho, Vishwanath R. Iyer, Edward M. Marcotte, and Andrew D. Ellington,

CENTER FOR SYSTEMS AND SYNTHETIC BIOLOGY

### **ATRA-sensitive cells HCT-115 and ATRA-resistant cells SW-620 both expressed RXR $\beta$ , but not RAR $\beta$**

Mary Agnew DIVISION OF NUTRITIONAL SCIENCES, DEPARTMENT OF HUMAN ECOLOGY

Eun Young Park and Michelle A. Lane, DIVISION OF NUTRITIONAL SCIENCES,

DEPARTMENT OF HUMAN ECOLOGY

### **Synthesis and characterization of PAMAM dendrimer-encapsulated monometallic, bimetallic, and core-shell metal nanoparticles**

Akila Amsavelu, Laura Gonzalez, and Sally Ho DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Sawyer Croley, Michael Gabay, Thao Nguyen, Ganesh Vijayaraghavan, Vivan Feng, Keith Stevenson and David Vandebout, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Effect of target duration and temporal uncertainty in a visual detection task**

Ryan Ash CENTER FOR PERCEPTUAL SYSTEMS, COLLEGE OF LIBERAL ARTS

Chris Palmer, Eyal Seidemann, and Yuzhi Chen, CENTER FOR PERCEPTUAL SYSTEMS, COLLEGE OF LIBERAL ARTS

### **Aptamer-mediated control of gene expression**

Chris Baumgarten-Arias DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Amos Yan and Andrew D. Ellington, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Undergraduate Research Fellowship**

### **Comparative morphology in the development of red-eared slider embryos in the egg and in culture**

Kristen Berkstresser SECTION OF INTEGRATIVE BIOLOGY

Christina Shoemaker, SECTION OF INTEGRATIVE BIOLOGY

### **Undergraduate Research Fellowship**

### **Analysis of enteric parasites in refugees in Texas, 2000-2005**

Bethany Blackstone SCHOOL OF BIOLOGICAL SCIENCES

Jeff P. Taylor and Leanne H. Field, SCHOOL OF BIOLOGICAL SCIENCES

### **The prevalence of *Staphylococcus aureus* and methicillin-resistant *Staphylococcus aureus* in a university setting**

Natalie Blum and Joseph William SCHOOL OF BIOLOGICAL SCIENCES

Marilyn Felkner, Tamara Baldwin, and Leanne Field, SCHOOL OF BIOLOGICAL SCIENCES

### **Retinoic acid increases $\beta$ -catenin levels in retinoic acid-resistant colon cancer cell lines**

Amanda Bowers DIVISION OF NUTRITIONAL SCIENCES, DEPARTMENT OF HUMAN ECOLOGY

Alice Dillard and Michelle Lane, DIVISION OF NUTRITIONAL SCIENCES, DEPARTMENT OF HUMAN ECOLOGY

### **Modeling the spread of canine distemper in lion prides**

Melissa Brady SCHOOL OF BIOLOGICAL SCIENCES

Lauren Meyers, SCHOOL OF BIOLOGICAL SCIENCES

Undergraduate Research Fellowship

### **Cloning of IDS, scotophobin, and *Manduca* genes by transfection into *E. coli* for DNA sequencing**

Armand Brown SCHOOL OF BIOLOGICAL SCIENCES

John Gorbet and Louis Irwin, DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF TEXAS AT EL PASO

### **Hydrogen-mediated catalytic C-C bond formation: The reductive Mannich reaction**

Jaclyn Brown DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Susan A. Garner and Michael J. Krische, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Undergraduate Research Fellowship

### **Replication of DNA microarrays**

Maria Cabezas DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Joohoon Kim and Richard Crooks, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Undergraduate Research Fellowship

### **A microbial assay of *Atta texana* pellets**

Rachel Cable SECTION OF INTEGRATIVE BIOLOGY

Andre Rodrigues and Ulrich Mueller, SECTION OF INTEGRATIVE BIOLOGY

Undergraduate Research Fellowship

### **Bubble pinch-off in a Hele-Shaw cell**

Brooks Campbell DEPARTMENT OF PHYSICS

Matt Thrasher and Harry Swinney, DEPARTMENT OF PHYSICS

Schlumberger Undergraduate Research Fellowship

### **Multicomponent reductive coupling of acetylene to aldehydes and aldimines**

Antonio Campos DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Ed Skucas, Jong-Rock Kong and Mike Krische, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Undergraduate Research Fellowship

### **Nucleic acid aptamer selection against glutamate dehydrogenase**

Caitlin Carroll INSTITUTE FOR CELLULAR AND MOLECULAR BIOLOGY

Andrew D. Ellington, INSTITUTE FOR CELLULAR AND MOLECULAR BIOLOGY

### **N-methyl-D-aspartate receptor expression in neurons treated with chronic intermittent ethanol**

Kara Chan SCHOOL OF BIOLOGICAL SCIENCES

Mei Qiang and Maharaj K. Ticku, DEPARTMENT OF PHARMACOLOGY, UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO

### **TAP tagging chicken proteins to understand their roles in RNA splicing**

Haemy Chung, Linda LeDuc, Daniel McKee, and Isuri Sonali Weerasinghe

Albert MacKrell and Scott Stevens, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY;  
INSTITUTE OF CELLULAR AND MOLECULAR BIOLOGY



### **The geochemistry of beryl and its implication for the classification of granitic pegmatites**

Ana Collins DEPARTMENT OF GEOLOGICAL SCIENCES, JACKSON SCHOOL OF GEOSCIENCES

Michael Wise, NATIONAL MUSEUM OF NATURAL HISTORY, SMITHSONIAN INSTITUTE

### **Binge drinking causes transcriptome remodeling in brain**

Benjamin Colvard SECTION OF NEUROBIOLOGY

Chris B. Walz, Oscar Velasquez, Pat S. Levin, Megan K. Mulligan, Julie A. Owen, and

Susan E. Bergeson, SECTION OF NEUROBIOLOGY

### **Affinity tagging proteins with roles in gene expression for proteomic analysis**

Brooke Corning, Stephanie Hsu, Maryam Kaous, Samantha Kuhn, and Theresa Spooner

Albert MacKrell and Scott Stevens, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY;

INSTITUTE OF CELLULAR AND MOLECULAR BIOLOGY

### **Assessment of the catalytic activity of G4-NH<sub>2</sub> dendrimer-encapsulated mono- and bimetallic nanoparticles**

Jay Croley, Michael Gabay and Thao Nguyen DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Laura Gonzalez, Sally Ho, Akila Amsavelu, Ganesh Vijayaraghavan, Vivan Feng, Keith Stevenson,

and David Vandembout, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Constructing a cell-free translation system for protein evolution *in vitro***

Kristen Crowell SCHOOL OF BIOLOGICAL SCIENCES

Randall A. Hughes and Andrew D. Ellington, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY;

INSTITUTE FOR CELLULAR AND MOLECULAR BIOLOGY

### **Undergraduate Research Fellowship**

### **CIV and MgII emission line widths and black hole masses in quasars**

Ashley Davis DEPARTMENT OF ASTRONOMY

Sarah Salvander, Emily Buell and Gregory Shields, DEPARTMENT OF ASTRONOMY

### **Light yields in the NO A detector**

Ashley Davis DEPARTMENT OF PHYSICS

Benton Pahlka and Karol Lang, DEPARTMENT OF PHYSICS

### **Dynamic polymer catalysis**

Olga Dykhno DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Andrew J. Boydston, and Christopher W. Bielawski, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Arnold and Mabel Beckman Foundation, Beckman Scholar (2006-2007), Undergraduate Research Fellowship,

Intel Foundation Undergraduate Research Fellowship

### **Studies towards the synthesis of 5-hydroxyaloin A**

Clarissa Enriquez DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Kristen Procko and Stephen F. Martin, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

PFIZER ORGANIC CHEMISTRY UNDERGRADUATE SCHOLARSHIP

### **Characterization of brood size and viability of *C. elegans* mutants**

Lauro Escobedo CLINICAL LABORATORY SCIENCES

Prashant Raghavan<sup>1</sup>, Jungsoo Lee<sup>1</sup>, Debra Murray<sup>2</sup>, George Weinstock<sup>2</sup>, Richard Gibbs<sup>2</sup>, and

Tae Ho Shin<sup>1</sup>, <sup>1</sup>DEPARTMENT OF CELLULAR AND MOLECULAR BIOLOGY, BAYLOR COLLEGE OF MEDICINE; <sup>2</sup>HUMAN GENOME

SEQUENCING CENTER, BAYLOR COLLEGE OF MEDICINE

**Determination of effect of Rad50's adenylate kinase activity on double-stranded break repair**

Eric Estrin SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Rajashree Deshpande and Tanya Paull, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Undergraduate Research Fellowship

**Through the thick and thin: Volume density measurements of the local interstellar medium**

Ross Falcon DEPARTMENT OF ASTRONOMY

Seth Redfield, DEPARTMENT OF ASTRONOMY

**Visualizing tunnels and pockets on molecular surfaces**

Powei Feng DEPARTMENT OF COMPUTER SCIENCES

Samrat Goswami, Vinay Siddavanahalli and Chandrajit Bajaj, DEPARTMENT OF COMPUTER SCIENCES

**Dopamine D2 receptor neuroadaptation on cholinergic interneurons of the nucleus accumbens following alcohol binge drinking**

Michelle Foshat DEPARTMENT OF PSYCHOLOGY, COLLEGE OF LIBERAL ARTS

Marguerite Camp and Adriana Alcantara, DEPARTMENT OF PSYCHOLOGY, COLLEGE OF LIBERAL ARTS

Undergraduate Research Fellowship

**Density functional calculations of low temperature CO oxidation on Au(111)**

Nathan Froemming DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY; INSTITUTE FOR THEORETICAL CHEMISTRY

Graeme Henkelman, DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY; INSTITUTE FOR THEORETICAL CHEMISTRY

Arnold and Mabel Beckman Foundation, Beckman Scholar (2006-2007), Undergraduate Research Fellowship

**Genetic potential in T7 bacteriophage: Evolution in fluctuating environments**

Emily Gabitzsch SECTION OF INTEGRATIVE BIOLOGY

Eric P. Miller, Jeremy Harmon, Erica Rubin, and Lauren Ancel Meyers, SECTION OF INTEGRATIVE BIOLOGY

**Effects of 13-cis-retinoic acid on GT1-7 hypothalamic cells**

Jennifer Griffin DEPARTMENT OF HUMAN ECOLOGY

Kally O'Reilly and Michelle Lane, DEPARTMENT OF HUMAN ECOLOGY

**Transient gene expression in Mungbean systems**

Rohan Gupta SCHOOL OF BIOLOGICAL SCIENCES

Katy Morgan, Jinesh Shah and K. Satasivan, SCHOOL OF BIOLOGICAL SCIENCES

Undergraduate Research Fellowship

**Comparing pH-sensitive carriers in transporting growth hormone**

Charles Haynes SCHOOL OF BIOLOGICAL SCIENCES

Mathilde Boude<sup>1</sup>, Omar Z. Fisher<sup>2</sup>, Daniel A. Carr<sup>3</sup>, and Nicholas A. Peppas<sup>2,3,4</sup>

<sup>1</sup>INSTITUT NATIONAL DES SCIENCES APPLIQUÉES DE TOULOUSE, TOULOUSE-CEDEX, FRANCE; <sup>2</sup>DEPARTMENT OF BIOMEDICAL ENGINEERING; <sup>3</sup>DEPARTMENT OF CHEMICAL ENGINEERING; <sup>4</sup>DIVISION OF PHARMACEUTICS

**Identification and characterization of a virulence-associated gene in *Shigella dysenteriae***

Keren Hilgendorf SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Nicola M. Davies and Shelley M. Payne, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Undergraduate Research Fellowship

### **BK calcium-activated potassium channels: Molecular gateways to the future**

Trent Hodgson SECTION OF NEUROBIOLOGY

Weiyang Li, Tom Middendorf, and Richard Aldrich, SECTION OF NEUROBIOLOGY

### **Iron transport systems in *Vibrio cholerae*: Investigating the roles of *fhuA* and *vhrA***

Lindsey Hoover SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Alexandra Mey and Shelley Payne, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Undergraduate Research Fellowship

### **An introduction to the Selberg class**

Kevin Hughes DEPARTMENT OF MATHEMATICS

Jeffrey Vaaler, DEPARTMENT OF MATHEMATICS

### **How the brain controls puberty and implications for ethnic differences**

Sonya Hughes COLLEGE OF LIBERAL ARTS

Andrea C. Gore, DIVISION OF PHARMACOLOGY AND TOXICOLOGY, COLLEGE OF PHARMACY

### **Selection of RNA aptamers against HIV-1 mutant 3 reverse transcriptase**

Naem Husain DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Angel Syrett, Na Li, and Andrew Ellington, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Undergraduate Research Fellowship

### **Research in fullerene coordinated complexes.**

Chris Huston DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Joseph Lagowski, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **The use of photoactivatable fluorescent proteins to study dynamics of maternal genes during early *Drosophila* development**

Minjung Kang SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

David Stein, SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

### **A fluorescent sensor for the phosphorylation state of ERK2 and real-time visualization of its activity in cancer cells**

Akihiro Kayama DIVISION OF MEDICINAL CHEMISTRY, COLLEGE OF PHARMACY

Kevin Dalby, DIVISION OF MEDICINAL CHEMISTRY, COLLEGE OF PHARMACY

University Co-Op Scholarship

### **A study of gain stability and charging effects in GEM foils**

Evan Kornacki DEPARTMENT OF PHYSICS

B. Azmoun, W. Anderson, D. Crary, J. Durham, T. Hemmick, J. Kamin, G. Karagiorgi, K. Kearney, G. Keeler, P. Lynch, R. Majka, M. Rumore, F. Simon, J. Sinsheimer, N. Smirnov, B. Surrow, C. Woody,

DEPARTMENT OF PHYSICS

### **Specificity for RNA/Protein Interactions**

David Kung DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Rick Russell, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Model Checking - Counter Abstraction**

Joyce Kung DEPARTMENT OF COMPUTER SCIENCES

Thomas Wahl and Allen Emerson, DEPARTMENT OF COMPUTER SCIENCES

### **Is the Airborne remedy doing more harm than good?**

Andrea Lam SCHOOL OF BIOLOGICAL SCIENCES

Research Interest Poster, SCHOOL OF BIOLOGICAL SCIENCES

### **Sleep/wake cycle and orexin innervation in migratory and nonmigratory songbirds**

Sherry Lim PSYCHOLOGY DEPARTMENT AND INSTITUTE FOR NEUROSCIENCE,

Kristan G. Singletary<sup>1</sup>, Pierre Deviche<sup>2</sup>, Creagh W. Bruener<sup>3</sup>, and Yvon Delville<sup>3</sup>,

<sup>1</sup>DEPARTMENT OF BIOLOGY, ARIZONA STATE UNIVERSITY, <sup>2</sup>INTEGRATIVE BIOLOGY AND INSTITUTE OF NEUROSCIENCE,

<sup>3</sup>PSYCHOLOGY DEPARTMENT AND INSTITUTE FOR NEUROSCIENCE,

### **Estrogen receptors in the aging male brain**

Grace Lin DIVISION OF PHARMACOLOGY AND TOXICOLOGY, COLLEGE OF PHARMACY

Di Wu and Andrea Gore, DIVISION OF PHARMACOLOGY AND TOXICOLOGY, COLLEGE OF PHARMACY

Undergraduate Research Fellowship

### **pH-sensitive polycationic nanogels for intracellular drug delivery**

Ming Lin DEPARTMENT OF BIOMEDICAL ENGINEERING, COLLEGE OF ENGINEERING

Omar Fisher, Tim Kim, Dhruv Desai, and Nicholas Peppas, DEPARTMENT OF BIOMEDICAL ENGINEERING,  
COLLEGE OF ENGINEERING

### **Developing antibodies to *Arabidopsis thaliana* translation initiation factor eIF4G**

Joceline Liu DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Karen Browning, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Force measurements using optical trapping**

Ashwin Madgavkar DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, COLLEGE OF ENGINEERING;

Martin Andersson and Randolph Duran, DEPARTMENT OF CHEMISTRY, UNIVERSITY OF FLORIDA

### **What makes Bright an oncogene?**

Shawn Mathur SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Christian Schmidt, Philip Tucker, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Undergraduate Research Fellowship

### **Cadherin expression in the developing chick neural tube**

Rica Mauricio SECTION OF NEUROBIOLOGY

Seema Agarwala, SECTION OF NEUROBIOLOGY

### **Synergistic effects of zinc and ethanol on glycine receptor function**

Lindsay McCracken WAGGONER CENTER FOR ALCOHOL AND ADDICTION RESEARCH; SECTION OF NEUROBIOLOGY

Beth S. Erlichman, R. Adron Harris, and S. John Mihic, WAGGONER CENTER FOR ALCOHOL AND ADDICTION  
RESEARCH; SECTION OF NEUROBIOLOGY

### **The role of the GABAA receptor $\beta_2$ subunit in the actions of alcohols and anesthetics**

Mandy McCracken SECTION OF NEUROBIOLOGY; WAGGONER CENTER FOR ALCOHOL AND ADDICTION RESEARCH

R. Adron Harris, SECTION OF NEUROBIOLOGY; WAGGONER CENTER FOR ALCOHOL AND ADDICTION RESEARCH

### **Epitope tagging of Aquarius**

Dan McKee SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

Al MacKrell and Scott Stevens, SECTION OF MOLECULAR GENETICS AND MICROBIOLOGY

### **The use of active feedback for thermal noise reduction in an ultrasensitive micro-oscillator**

Michelle Millan DEPARTMENT OF PHYSICS

Wei Lu, Han-Jong Chia, Rosa Cardenas, Michelle Chabot, and John Markert, DEPARTMENT OF PHYSICS

Schlumberger Undergraduate Research Fellowship

### **Unraveling the violent history of galaxies**

Sarah Miller DEPARTMENT OF ASTRONOMY

Kyle Penner and Shardha Jogee, DEPARTMENT OF ASTRONOMY

### **Maximizing the kicks from spinning binary black hole mergers**

Sarah Miller DEPARTMENT OF PHYSICS

Richard Matzner, DEPARTMENT OF PHYSICS

### **Single-molecule spectroscopic studies of conjugated polymers**

William Miller DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

John K. Grey, Doo Young Kim, Brent C. Norris, and Paul F. Barbara, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

### **Effects of a *Megalomyrmex symmetochus* alkaloid on host ant behavior**

Jennifer Mir SECTION OF INTEGRATIVE BIOLOGY

Rachelle Adams and Ulrich Mueller, SECTION OF INTEGRATIVE BIOLOGY

Undergraduate Research Fellowship

### **Bringing verification to a virtual world**

William Moldenhauer DEPARTMENT OF COMPUTER SCIENCES

J.C. Browne and Calvin Lin, DEPARTMENT OF COMPUTER SCIENCES

### **Estrogen receptor $\alpha$ expression in the median eminence: Localization on neurons and glia**

Monique Monita SECTION OF NEUROBIOLOGY

Weiling Yin<sup>1</sup>, Yi Zuo<sup>2</sup>, and Andrea C. Gore<sup>1,2</sup>, <sup>1</sup>SECTION OF NEUROBIOLOGY; DIVISION OF PHARMACOLOGY AND TOXICOLOGY, COLLEGE OF PHARMACY; <sup>2</sup>INSTITUTE FOR NEUROSCIENCE

Undergraduate Research Fellowship

### **Wildfires induce rapid selection on Australian desert lizards**

Camile Moray SECTION OF INTEGRATIVE BIOLOGY

Stephen Goodyear and Eric Pianka, SECTION OF INTEGRATIVE BIOLOGY

### **Adolescent behavior patterns, subjective importance, and self-esteem**

Lauren Munsell DIVISION OF HUMAN DEVELOPMENT AND FAMILY SCIENCES, DEPARTMENT OF HUMAN ECOLOGY

Leslie Grunden and Jennifer Matjasko, DIVISION OF HUMAN DEVELOPMENT AND FAMILY SCIENCES, DEPARTMENT OF HUMAN ECOLOGY

### **Machine learning in the game of Go**

Thomas Nelson DEPARTMENT OF COMPUTER SCIENCES

Peter Stone, DEPARTMENT OF COMPUTER SCIENCES

### **High throughput screening of aptamers against specific cell lines**

Hong Hanh Nguyen DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Ted Chi-Tai Chu, Eun Jeong Cho, and Andy Ellington, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY;  
INSTITUTE FOR CELLULAR AND MOLECULAR BIOLOGY

University Co-Op Scholarship, Chemistry & Biochemistry Author's Scholarship,  
Undergraduate Research Fellowship

### **Building an autonomous car**

Tarun Nimmagadda DEPARTMENT OF COMPUTER SCIENCES

Peter Stone, DEPARTMENT OF COMPUTER SCIENCES

### **Role of Histidine in the active site of *cis*-3-chloroacrylic acid dehalogenase**

Tony Okoro DEPARTMENT OF HUMAN ECOLOGY

Hector Serrano and Christian Whitman, DEPARTMENT OF HUMAN ECOLOGY

### **Use of fluorescent-protein tagging to determine the sub-cellular localization of *Arabidopsis annexins***

Nathan Paczan SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

Mari Salmi, Greg Clark, and Stanley Roux, SECTION OF MOLECULAR CELL AND DEVELOPMENTAL BIOLOGY

Undergraduate Research Fellowship

### **Detection of the virulence genes in methicillin-resistant *Staphylococcus aureus* (MRSA) by polymerase chain reaction (PCR)**

Isaac Pan SCHOOL OF BIOLOGICAL SCIENCES

Ana Maria Valle and Leanne H. Field, SCHOOL OF BIOLOGICAL SCIENCES; TEXAS DEPARTMENT OF  
STATE HEALTH SERVICES

### **Constraining the interaction history of galaxies over 8 Gyr**

Kyle Penner DEPARTMENT OF ASTRONOMY

Sarah Miller and Shardha Jogee, DEPARTMENT OF ASTRONOMY

### **Use of the refractive index increment of amino acids for the calculation of the concentrations of proteins in solution**

Andrew Pham SECTION OF NEUROBIOLOGY

Samia Hamed, Claire Riggs, and Austen Riggs, SECTION OF NEUROBIOLOGY

Undergraduate Research Fellowship

### **Mechanical properties of the cell wall in *Schizosaccharomyces pombe***

Asher Philip DEPARTMENT OF PHYSICS; CENTER FOR NONLINEAR DYNAMICS

Rongxin Huang, Chieze Ibeneche, and Ernst-Ludwig Florin, DEPARTMENT OF PHYSICS;

CENTER FOR NONLINEAR DYNAMICS

Intel Foundation Undergraduate Research Fellowship

### **Expression patterns of Wnt4, FoxL2, and Dax1 in a species exhibiting temperature-dependent sex determination**

Joanna Queen SECTION OF INTEGRATIVE BIOLOGY

Christina Shoemaker and David Crews, SECTION OF INTEGRATIVE BIOLOGY

### **Computational detection of correlated DNA regions**

Mickey Ristroph DEPARTMENT OF COMPUTER SCIENCES; SCHOOL OF BIOLOGICAL SCIENCES

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### **Using luciferase as a reporter to measure extracellular ATP levels in plants**

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### **Investigation of subunit interactions in human mitochondrial DNA polymerase**

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### **RNA aptamer selection against proteins of *Burkholderia pseudomallei***

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Sarah Day<sup>1</sup> and Rafael Frongillo<sup>2</sup>, <sup>1</sup>THE COLLEGE OF WILLIAM AND MARY; <sup>2</sup>CORNELL UNIVERSITY



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Margaret Hanausek and Thomas J. Slaga, DEPARTMENT OF PHARMACOLOGY,

UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO

### **Phylogenetic classification of the algal genus *Microsterias***

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DEPARTMENT OF HUMAN ECOLOGY

Amy Webb, Shannon Greene, and Edward Anderson,

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Alice Zhao DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

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### **Gene expression of steroidogenic enzymes in the whiptail lizard, *Cnemidophorus uniparens***

Jun Zhao Sonia Chin INSTITUTE FOR NEUROSCIENCE<sup>1</sup>; SECTION OF INTEGRATIVE BIOLOGY<sup>2</sup>

Brian Dias<sup>1</sup> and David Crews<sup>2</sup>, INSTITUTE FOR NEUROSCIENCE<sup>1</sup>; SECTION OF INTEGRATIVE BIOLOGY<sup>2</sup>

### **An improved algorithm for error correction of reads in DNA fragment assembly**

Jia Zheng DEPARTMENT OF COMPUTER SCIENCES

Hon-Wai Leong<sup>1</sup>, Haixu Tang<sup>2</sup>, <sup>1</sup>DEPARTMENT OF COMPUTER SCIENCE, NATIONAL UNIVERSITY OF SINGAPORE;

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