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## *Acknowledgements*

UBRP and the UBRP Conference are funded in part by grants from the Howard Hughes Medical Institute (52003749), the National Institutes of Health (TW00036), the National Science Foundation (DBI-0242842), the Beckman Foundation, the American Society for Pharmacology and Experimental Therapeutics, faculty sponsor's research grants, and The University of Arizona. We gratefully acknowledge our funding sources.

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I.

THE SIXTEENTH ANNUAL  
**UNDERGRADUATE BIOLOGY  
RESEARCH  
CONFERENCE**

*January 29, 2005*

# 16th Annual Undergraduate Biology Research Conference

Life Sciences South Building

Saturday, January 29, 2005

8:00 am - 9:00 am	Students set up posters Refreshments Room 240	
9:00 am - 9:10 am	Welcome	Carol Bender, Director, UBRP, BRAVO!
9:10 am - 10:10 am	Poster Session I – Life Sciences 2nd and 3rd Floor (Includes posters by participants in outreach programs)	
10:10 am – 10:20 am *	Mini-awards Ceremony for Outreach Programs' Participants	Dr. Michael Wells Professor of Biochemistry
10:20 am – 11:20 am	Poster Session II – Life Sciences 2nd and 3rd Floor	
11:20 am – 11:50 am	Introduction of Keynote Speaker 2nd Floor Atrium	Daniel Wood, UBRP student
	Keynote Address – “The Shattered Self: The End of Natural Evolution”	Dr. Pierre Baldi, Director, Institute for Genomics and Bioinformatics at UC Irvine and Professor of Information and Computer Science and Biological Chemistry
11:50 am - 12:50 pm	Poster Session III – Life Sciences 2nd and 3rd Floor	
12:50 pm – 1:00 pm	Presentation of Awards	Dr. Michael Wells Professor of Biochemistry

UBRP and the UBRP Conference are funded in part by grants from the Howard Hughes Medical Institute (52003749), the National Institutes of Health (TW00036), the National Science Foundation (DBI-0242842), the Beckman Foundation, the American Society for Pharmacology and Experimental Therapeutics, faculty sponsor's research grants, and The University of Arizona. We gratefully acknowledge our funding sources.

# LIST OF UNDERGRADUATE PRESENTERS AND THEIR ABSTRACTS

## SIXTEENTH ANNUAL UNDERGRADUATE BIOLOGY RESEARCH CONFERENCE

1. ANALYSIS OF A DOMINANT INTRAGENIC SUPPRESSOR OF BRI1 IN ARABIDOPSIS. *Andrea Aguirre, Rene Michel, Frans Tax*
2. IDENTIFICATION OF THE MLT1 GENE REQUIRED EYESPOT ASSEMBLY IN CHLAMYDOMONAS REINHARDTII. *Sommer Aldulaimi, TelsaMittelmeier, Carol Dieckmann*
3. DISCOVERY OF ANTINOCICEPTIVE COMPOUNDS FOR TREATMENT OF PAIN. *Adrienne Begaye, Josephine Lai, Shouwu Ma, Hamid Badghisi*
4. AN EXPLORATION OF INTERCELLULAR COMMUNICATION IN THE DEVELOPING OLFACTORY SYSTEM OF DROSOPHILA MELANOGASTER. *John Biebelhausen, Nicholas J. Gibson, Leslie P. Tolbert*
5. METABOLITE CHANGES IN HT-29 XENOGRAFT TUMORS FOLLOWING HIF-1 $\alpha$  INHIBITION WITH PX-478 AS STUDIED BY MR SPECTROSCOPY IN VIVO AND EX VIVO. *Kvar Black, Benedicte Jordan, Ian F. Robey, Matthew Runquist, Garth Powis, Robert J. Gillies*
6. MECHANISM OF HER-2/NEU TRANSCRIPTION INITIATION IN BREAST CANCER. *Meghan Boros, Amy Ziemba, Scot W. Ebbinghaus*
7. UVA-INDUCED MODULATION OF Bcl-XL BY C-Jun -TERMINAL KINASE (JNK) IN HUMAN KERATINOCYTES. *Olivia Brown, Amy L. Silvers, Michael A Bachelor, G. Timothy Bowden*
8. STUDIES OF 17-O LABELED SULFITE OXIDASE USING MULTI-DIMENSIONAL PULSED EPR SPECTROSCOPY. *Eric Bultman, Andrei Astachkine, Changjian Feng, John Enemark*
9. ENTERAL ADMINISTRATION OF EGF + HB-EGF COMBINATION DECREASES THE INCIDENCE OF NECROTIZING ENTEROCOLITIS. *Lori Burger, Melissa D. Halpern, Tara A. Saunders, Jessica A. Clark, Sarah M. Doelle, Catherine S. Williams, Bohuslav Dvorak*
10. USA CORE LOCI ONLINE: Y-CHROMOSOMAL SHORT TANDEM REPEAT (USAYSTR) HAPLOTYPE REFERENCE DATABASE. *Karl Calderon, Alan J. Redd, Nirav Merchant, Michael R. Hammer*
11. REAL TIME PCR VERIFICATION OF GENE EXPRESSION OF HUMAN UMBILICAL CORD BLOOD STEM CELLS. *Daniel Camacho, Xianghui He, Tom Tsang, David T. Harris*
12. EFFECTS OF PEA APHID (*Acyrtosiphon pisum*) T-TYPE SECONDARY SYMBIONTS ON THE BEHAVIOR OF A NATURAL ENEMY, *Aphidius ervi*, IN Y-TUBE. *Jaime Campos, Kerry M. Oliver, Martha S. Hunter*
13. A GENETIC APPROACH TO IDENTIFY GENES INVOLVED IN ACQUIRED THERMOTOLERANCE IN *ARABIDOPSIS THALIANA*. *Joseph Carroll, Dawool Seok, Ung Lee, Elizabeth Vierling*
14. PARTIAL PURIFICATION AND CHARACTERIZATION OF A HALOTOLERANT AMIDASE IN *HALORUBRUM* SP. E4. *Susheela Carroll, Derek Fairley, Mike Larkin, Christopher Rensing*
15. INVESTIGACION DEL POBLADO DE CIBUTA SOBRE CONTAMINANTES (INVESTIGATION OF THE POPULATION OF CIBUTA ABOUT ENVIRONMENTAL CONTAMINANTS). *Carmina Cervantes*

16. SELECTIVE MELANOTROPIN DRUGS FOR OBESITY AND RELATED DISORDERS. *Kevin Chandler, Mingying Cai, Dev Trivedi, Victor J. Hruby*
17. MUC1 AND  $\beta$ -CATENIN INTERACTIONS PROMOTE BREAST CANCER METASTASIS. *Andrew Chang, Dr. Joyce A. Schroeder*
18. TRANSLATIONAL CONTROL OF EARLY TRYPSIN mRNA VIA PHOSPHORYLATION IN THE MOSQUITO *Aedes aegypti*. *Matthew Clark, Linda Mobula, Michelle Brandon, James E. Pennington, Michael A. Wells*
19. DEVELOPMENT OF A NEW METHOD TO QUANTITATIVELY MEASURE ADP-RIBOSE POLYMERS. *Omar Contreras, Donna L. Coyle, Myron K. Jacobson*
20. THE ROLE OF SMALL HSPS IN *ARABIDOPSIS THALIANA* THERMOTOLERANCE. *Jennifer Corrigan, Julie Bordowitz, Surekha Katiyar Agarwal, Eman Basha, Elizabeth Vierling*
21. SENSITIVE DETECTION OF A MOLECULAR MONOLAYER BY AN ULTRA THIN FILM OPTICAL PLANAR WAVEGUIDE. *Jill Craven*
22. DIFFERENTIAL ENCODING OF MOVEMENT AND SPATIAL CONTEXT IN SUPERFICIAL AND DEEP LAYERS OF THE POSTERIOR PARIETAL CORTEX. *Brynne Crowell, S.N. Burke, M.K. Chawla, M.R. Penner, P.F. Worley, B.L. McNaughton, C.A. Barnes*
23. HUMAN GLIOMA CELL LINES TESTED FOR GENE EXPRESSION OF TUMOR ANTIGENS. *Rachel Diaz, Margaret H. Smith*
24. CYTOCHROME C OXIDASE: EFFECTS OF ANTIOXIDANTS. *Barbora Dvorakova, Claire Payne*
25. ROLE OF NF- $\kappa$ B IN UVB-IRRADIATED IMMORTALIZED KERATINOCYTES POST-TREATED WITH EPIGALLOCATECHIN-3-GALLATE. *Aluvia Escalante, Terry H. Landowski, Betty G. Gibson, Robert T. Dorr, Steven P. Stratton*
26. EFFICIENCY OF DIFFERENT SILENCING-CONSTRUCTS IN INDUCING RNAi SUCCESSFULLY IN *ARABIDOPSIS THALIANA*. *Alice Ferng, Chonglie Ma, Richard Jorgensen*
27. CHARACTERIZATION OF MICROBIAL POPULATIONS IN SULFATE REDUCING BIOFILM USING MOLECULAR ECOLOGY TECHNIQUES AT WAGENINGEN UNIVERSITY, THE NETHERLANDS. *Stephanie Freeman, Mahmut Altinbas, Dr. Hauke Smidt, Prof .Dr. Alfons Stams, Dr. Reyes Sierra*
28. MEDSTAT-F, A NOVEL FIBRILLAR COLLAGEN HEMOSTAT: COMPARISON WITH AVITENE IN A RABBIT MODEL OF SPLENIC LACERATION. *Michael French, Ulreich JB, Demeure MJ, Singh J, Nelson A, Singh C, Valles AV, Pierson DP, Shishido N, Li-S-T*
29. COMMUNITY NETWORKING FOR SUSTAINABLE SCHOOLYARD HABITATS. *Justin Gaines, Stephanie Pagac*
30. VITAMIN E ANALOGUE AS A NOVEL TREATMENT FOR CANCER. *Mikhail Gold, Tobias Hahn, Emmanuel T. Akporiaye*
31. ELUCIDATION OF THE MECHANISMS OF RESPONSE TO HEAT AND LIGHT STRESS IN TOMATO. *Emily Hatstrup, Paul Haynes*
32. INVESTIGATING THE INTERACTION OF THE GIANT PROTEIN NEBULIN WITH THE INTERMEDIATE FILAMENT PROTEIN DESMIN. *Syerra Henderson, Gloria Conover, Carol Gregorio*

33. PROTEIN MODIFICATION OF SYNTHETIC VASCULAR GRAFTS. *Heidi Hofer, Kristen O'Halloran, Alice Stone, Stuart Williams*
34. TONOTOPICALLY ORGANIZED AXONAL PROJECTIONS TO THE AUDITORY THALAMUS. *Michael Holmes, David S. Velenovsky, Nathaniel T. McMullen*
35. LIMITATIONS ON DENATURING GRADIENT GEL ELECTROPHORESIS ANALYSIS OF BACTERIAL DIVERSITY IN MINE TAILINGS. *Sadie Iverson, Karyna Rosario, Raina M. Maier*
36. IDENTIFYING NOVEL PROTEIN INTERACTIONS WITH THE *ARABIDOPSIS THALIANA* GENE FIS2 THROUGH A YEAST TWO-HYBRID SCREEN.. *Shawn Jackson, Dongfang Wang, Mark Tyson, Ramin Yadegari*
37. INCREASED EXPRESSION OF GLUCOSE-6-PHOSPHATE DEHYDROGENASE SENSITIZES MURINE THYMOCYTES TO GLUCOCORTICOID-INDUCED APOPTOSIS. *David Johnson, Margaret E. Tome, Margaret M. Briehl*
38. EFFECTS OF FIRE ON MIDDEN MOVEMENT OF ENDANGERED MT. GRAHAM RED SQUIRRELS. *Julia Lin Jolley, Claire Zugmeyer, Dr. John Koprowski*
39. SCREEN FOR GENES INVOLVED IN INTEGRIN SIGNALING. *S. Kent Kemmish Jr, Danny Brower, Alison Jannuzi.*
40. STUDY OF CHARGED LIPIDS ON ACTIVATION OF RHODOPSIN USING PLASMON WAVEGUIDE RESONANCE (PWR) SPECTROSCOPY. *Pick Wei Lau, Michael F. Brown*
41. CREATING BACTERIAL LUCIFERASE FUSION ENZYME BY LINKING LUXA AND LUXB GENES. *Junglim Lee, John Osterhout, and Thomas O. Baldwin*
42. VOLUNTARY EXERCISE TRAINING INCREASES INSULIN ACTION ON GLUCOSE TRANSPORT BUT NOT ON UPSTREAM INSULIN SIGNALING IN SKELETAL MUSCLE OF HYPERTENSIVE TG(m RE<sup>2</sup>)27 RATS. *Andrew Lemieux, Cody J. Diehl, Julie A. Sloniger, Erik. J. Henriksen*
43. DETERMINATION OF ESTROGENIC ACTIVITY IN ENVIRONMENTAL SOLIDS. *Cary Leung, Jianmin Zhang*
44. CHANGES IN CELL AND NUCLEI SIZE THROUGH OVEREXPRESSION OF CELL CYCLE REGULATORY PROTEINS SUGGEST SEPARATE PATHWAYS FOR THE REGULATION OF CELL GROWTH AND CELL PLOIDY. *Vivian Lien, Airlia Thompson, Paula Campbell, Jodi Mosley, Giovanni Bosco*
45. EVOLUTION OF EXTRA-PAIR MATING STRATEGIES IN A SOCIALLY MONOGAMOUS BIRD: CAUSES AND CONSEQUENCES. *Erin Lindstedt, Alexander V. Badyaev*
46. REGULATION OF MIDGUT PROTEASE EXPRESSION AND OOGENESIS IN *AEDES AEGYPTI*. *Stephen Lu, Tracey Paetow, James Pennington, Michael Wells*
47. TITERES EN ECOLOGIA (PUPPETS IN ECOLOGY). *Crisel Lugo, Damaris Suarez, Arlahé Beltrán, Dylen Velasquez*
48. ALLOCATION STRATEGIES OF *DATURA WRIGHTII* IN WET AND DRY ENVIRONMENTS. *Kelly Mackay, Judith Bronstein, Goggy Davidowitz, Travis Huxman*
49. INDUCTION OF APOPTOSIS IN G-361 HUMAN MELANOMA CELLS. *Brittany Martin, Georg Wondrak, Elaine Jacobson*



50. LOOKING FOR CHANGE? CHECK YOUR GENES? ANTIGENIC VARIATION OF *GIARDIA LAMBLIA*.  
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51. VIVEROS Y INVERNADEROS ESCOLARES (SCHOOL-BASED NURSERIES AND GREEN HOUSES).  
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53. REVERSE GENETIC ANALYSIS OF THE EXTRACELLULAR DOMAIN OF THE RECEPTOR KINASE BRASSINOSTEROID INSENSITIVE 1 (Brl 1) IN *ARABIDOPSIS THALIANA*. *Rene Michel, Michael Wierzbica, Frans Tax*
54. REACTIVATION OF ARC PROTEIN FOLLOWING BEHAVIORAL EXPLORATION. *Dalia Mikhael, V. Ramirez-Amaya, A. Vazdarjanova, P.F. Worley, C.A. Barnes*
55. *Arc* EXPRESSION IN THE HIPPOCAMPUS OF ADULT vs. AGED RATS. *Heather Milliken, M.R. Penner, M.K. Chawla, V. Ramirez-Amaya, S.N. Burke, P.F. Worley, C.A. Barnes.*
56. IDENTIFICATION AND MAPPING OF MUTATIONS AFFECTING FRUIT DEVELOPMENT IN *ARABIDOPSIS THALIANA*. *Andrea Mitchell, Frans Tax*
57. CHARACTERIZATION AND GENERATION OF A MELANOMA PHENOTYPE EXHIBITING ROBUST METASTASIS VIA MICROENVIRONMENTAL ACIDITY. *Raymond Moellering, Robert J. Gillies*
58. PURIFICATION AND INVESTIGATION OF GTP CYCLOHYDROLASE II HOMOLOGS FROM *HELICOBACTER PYLORI*. *Shane Morrison, Vahe Bandarian*
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60. SYNTHESIS OF OCTASUBSTITUTED BENZYLARYL ETHER DENDRITIC PHTHALOCYANINES.  
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61. EFFECT OF RESISTANCE ALLELES TO BACILLUS THURINGIENSIS (BT) TOXIN IN PINK BOLLWORM, PECTINOPHORA GOSSYPIELLA ON ABILITY TO DETECT PHEROMONE TRAPS IN THE FIELD. *Megan Nyboer, C. Ellers-Kirk, James Sollome, Robert W. Biggs, R. Staten, T.J. Dennehy, B. D. Tabashnik*
62. DETERMINATION OF THE CELLULAR SOURCE OF IFN- $\gamma$  and IL-4 IN HUMAN DECIDUAL TISSUE.  
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63. THE EFFECT OF X-LL3 OVER EXPRESSION ON OLFACTORY EPITHELIUM DEVELOPMENT IN *XENOPUS LAEVIS*. *Douglas Ota, Andres Clark, Gail Burd*
64. WHOLE BLOOD PLATELET AGGREGATION IN AN ANIMAL MODEL OF TYPE 2 DIABETES. *Garrett Pacheco, Grace Davis-Gorman, Lisa Davidson, Loren Miller, Katie Finnerty, Raysenia James, Danielle Skrobach, Leslie Ritter, Paul Nolan, Paul McDonagh*
65. SURVEY OF MITOCHONDRIAL RNA IN *SACCHAROMYCES CERVISIAE* AFTER NUCLEAR GENE DELETIONS. *Alok Patel*
66. ROLE OF VIRULENCE AND GLOBAL REGULATORS IN EXPRESSION OF TYPE 1 PILI OF ENTEROPATHOGENIC *ESCHERICHIA COLI*. *Christine Poach, Jorge A. Giron*

67. AN ITERATIVE ROOT-FINDING APPROACH FOR DETERMINATION OF ANISOTROPIC OPTICAL CONSTANTS AND SURFACE COVERAGE OF CYTOCHROME c FILMS. *Nicole Rasmussen, Anne F. Runge, S.Scott Saavedra, Sergio Mendes*
68. CONVERCION DE GRASAS NATURALES/ANIMALES A BIODISEL (CONVERSION OF VEGETABLE AND ANIMAL OILS TO BODIESEL). *Carmina Reyes*
69. THE ROLE OF METAL DOSING IN SULFATE REDUCTION AT LOW pH . *Pieter Rowlette, Piet Lens, Sonia Lopes*
70. EFFECTS OF ANANDAMIDE APPLIED TOPICALLY TO CB2 KNOCKOUT MICE. *Megan Rude, T. Philip Malan*
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72. COMPARISON OF ORGANIC CATION TRANSPORTER MRNA LEVELS IN MOUSE PROXIMAL TUBULES USING REAL-TIME PCR. *Emily Schaaf, Kristen K. Evans, Stephen H. Wright, William H. Dantzer*
73. LEARNING IN THE RAT: INTERACTIONS BETWEEN THE HIPPOCAMPUS, AMYGDALA, AND NUCLEUS ACCUMBENS. *Michael Schaner, M.K. Chawla, R. Ito, C.A. Barnes, B.J. Everitt, T.W. Robbins*
74. MULTIPLE MATING AND SEGREGATION DISTORTION IN NATURAL POPULATIONS OF THE HOUSE MOUSE, *MUS MUSCULUS*. *Kimberly Smith, Matthew D. Dean, Michael W. Nachman*
75. ESTIMATION AND EXPLANATION OF Y CHROMOSOME MICROSATELLITES FROM PEDIGREE ANALYSIS. *Jennifer Spangle, Matthew Kaplan, Michael Hammer*
76. NEUROINFLAMMATION ALTERS THE HIPPOCAMPAL PATTERN OF BEHAVIORALLY-INDUCED *ARC* EXPRESSION. *Aldrich Sy, S. Rosi, V. Ramirez-Amaya, A. Vazdarjanova, P.F. Worley, C.A. Barnes, G. L. Wenk*
77. BEYOND SILICON COMPUTING-EXPLORING HOW NATURE COMPUTES. *Kate Taralova, Tim Spriggs*
78. *IN VITRO* STUDIES OF AMMONIA METABOLISM IN *Aedes Aegypti* FAT BODY USING STABLE ISOTOPE LABELING. *Kelsey Thorson, Patricia Y. Scaraffia, Qingfen Zhang, Vicki H. Wysocki, Michael A. Wells.*
79. PRO-DRUGS FOR EFFECTIVE TOPICAL DELIVERY OF NICOTINIC ACID. *Maria Trissal , Elaine Jacobson, PhD, MoonSun Kim PhD*
80. STUDYING THE FUNCTIONAL PROPERTIES OF THE NEBULOUS MUSCLE PROTEIN, NEBULIN. *Melinda Valichnac, Abigail McElhinny, Carol Gregorio*
81. X-CHROMOSOME ELIMINATION AT MALE PRODUCTION IN ASEXUAL APHID LINEAGES. *Monica Villar, Christoph Vorburger, Alex C.C. Wilson*
82. EFFECTS OF XDLL3 AND XDLL4 MORPHOLINOS ON THE DEVELOPING *Xenopus laevis* EMBRYO. *Sarah Whitley, Andrew Clark, Melissa Drake, Christina Kwong, Gail Burd*

83. BACTERIA, APOTOSIS, AND COLON CANCER. *Megan Wilson, Renata Stepankova, Hana Holubec, Claire Payne, Harris Bernstein, Luca Vannucci, Katerina Dvorakova, Harinder Garewal*
84. ANALYSIS OF STRUCTURE/FUNCTION RELATIONSHIP BETWEEN COILED-COIL REGION AND AXIAL CHANNEL OF HSP104. *Justin Wong, Ung Lee, Elizabeth Vierling*
85. ANALYSIS OF POLYCOMB GROUP PROTEINS CLF, EMF2, VRN2, MEA, FIE, EZA1 AND FIS2 INTERACTIONS IN *ARABIDOPSIS* USING A YEAST TWO HYBRID APPROACH. *Mark Tyson, Dongfang Wang, Shawn Jackson, Ramin Yadegari*
86. CRITICAL EVALUATION OF THE VARYING INCUBATION ENVIRONMENTS ON THE VIABILITY OF PRECISION-CUT LIVER CHIPS POST-VITRIFICATION. *Erin Blomquist, Aaron Pershing, Jeff Catania, A.Jay Gandolfi*
87. THE ROLE OF COP9 SIGNALOSOME SUBUNITS 5a AND 5b (CSN5a/b) DURING EARLY PLANT DEVELOPMENT. *Salmon Carlos Leija, Dongfang Wang, Megan Skaggs, Ramin Yadegari*
88. THE TUMAMOC HILL BUFFELGRASS PROJECT. *Kathryn Giroux, Travis Bean, Julio Betancourt*
89. CREATING A SCHOOL YARD GARDEN AT AJ MITCHELL ELEMENTARY. *Priscilla Crespo, Mayra Atreaga, Jorge Garcia, Charles Hanneusean and Raquel Rodriques*

*II.*

*UNDERGRADUATE BIOLOGY RESEARCH PROGRAM*

*2004-2005*

***UNDERGRADUATE BIOLOGY RESEARCH PROGRAM  
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Dr. Vahe Bandarian

UNDERGRADUATE

Stephanie Musante  
Clinton Musil  
Ian Musil  
Vanessa Naff  
Celine Nardi  
Zaneta Navratilova  
Michael Neish  
Alexandra Nelson  
Danielle Nevarez  
Julia Nimlos  
Megan Nyboer  
Ryan Odegard  
Annetta Odeh  
Diana Olivas  
Mary Pankratz  
Chirag Patel  
Allison Peluso  
Cynthia Perry  
Christine Poach  
Nicole Rasmussen  
Jennifer Roberts  
Jennifer Roll  
Mary Romanoski

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Dr. Leland Pierson  
Dr. Danny Brower  
Dr. Danny Brower  
    Dr. Michael Hammer  
Dr. Leann Gast  
Dr. Mani Ramaswami  
Dr. Dominic McGrath  
Dr. Michael Demeure  
Dr. Frans Tax, Dr. Cristina Ferrandiz  
Dr. Linda Restifo  
Dr. Yves Carriere  
Dr. Carlos Moreno  
Dr. Linda Meade-Tollin  
Dr. Mark Brown  
Dr. Elena Plante  
Dr. Mani Ramaswami  
Dr. Ronald Heimark, Dr. Scott Boitano  
    Dr. Carol Gregorio  
Dr. Jorge Giron  
Dr. Scott Saavedra  
Dr. Valerie Reyna  
Dr. Elliot Epner, Dr. Zhongguo Xiong  
Dr. Michael Graner  
Dr. Emmanuel Katsantis

*PARTICIPANTS AND FACULTY SPONSORS, Continued*  
*2004-2005*

UNDERGRADUATE

Kristopher Rosburg  
Pieter Rowlette  
Megan Rude  
Mansi Sarihan  
Arvind Satyanarayan  
Emily Schaaf  
Basil Schaheen  
Lara Schaheen  
Michael Schaner  
Elizabeth Schneider  
Jason Schneider  
Samantha Serey  
Nehal Shah

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Dr. Chris Appleton  
Dr. Jim Field, Dr. Piet Lens  
Dr. Philip Malan  
Dr. Eric Vu, Dr. Clark Lantz  
Dr. Susan Martinez-Conde  
Dr. William Dantzler  
Dr. Hanna (Johnny) Fares  
Dr. Hanna (Johnny) Fares  
Dr. Carol Barnes, Dr. Barry Everitt  
Dr. Margaret Smith  
Dr. John Koprowski  
Dr. Jamie Collins  
Dr. Ron Lukas, Dr. Paul McDonagh



UNDERGRADUATE

Charles Shanahan  
Thaddeus Smith  
Kristin Sikkink  
Jennifer Spangle  
Nicholas Stea  
Jha'Nae Stoffer  
Sarah Sweeney  
Aldrich Sy  
Shirley Tang  
Stephanie Tang  
Katherine Taylor-Garcia  
Hung Tran  
Sebastian Treusch  
Maria Trissal  
Bhumi Trivedi  
Melinda Valichnac  
Amanda Valles  
Reina Watanabe  
Amanda Wendt  
Maria Williams  
Gunatilaka  
Megan Wilson  
  
Justin Wong  
Daniel Wood  
Michael Zhou

FACULTY SPONSOR

Dr. Dominic McGrath  
Dr. Indraneel Ghosh  
    Dr. Vicki Chandler  
Dr. Michael Hammer  
    Dr. Emmanuel Meuillet-May  
Dr. David Smith, Dr. Roger Miesfeld  
Dr Giovanni Bosco  
Dr. Todd Camenisch, Dr. Gary Wenk  
Dr. Ron Lukas  
Dr. Danny Brower  
Dr. Heddwen Brooks  
Dr. Elizabeth Willott  
Dr. Hanna (Johnny) Fares  
Dr. Elaine Jacobson  
    Dr. Rodney Adam  
Dr. Carol Gregorio  
Dr. Judith Ulreich  
Dr. Paul McDonagh, Dr. Marc Laskar  
Dr. Daryl Goll  
Dr. Judith Bronstein, Dr. Leslie  
  
Dr. Katerina Dvorakova,  
Dr. Renata Stepankova  
Dr. Elizabeth Vierling  
Dr. Jesse Martinez  
    Dr. Kimberly Ogden

*UBRP/MINORITY ACCESS TO RESEARCH CAREERS  
(MARC) STUDENTS  
2004-2005*

UNDERGRADUATE

Mohammed Abdelwahab  
Andrea Aguirre  
Olivia Brown  
Karl Calderon  
Omar Contreras  
Mindy Escobar  
Albert Gutierrez  
Miquia Henderson  
Saloman Carlos Leija  
Brittany Martin  
Charles Martinez  
Garrett Pacheco  
Kristin Robinson

FACULTY SPONSOR

Dr. Leslie Tolbert  
Dr. Nafees Ahmad, Dr. Frans Tax  
Dr. Tim Bowden  
    Dr. Michael Hammer  
Dr. Myron Jacobson  
Dr. Linda Restifo  
Dr. Anne Cress  
Dr. Murray Brilliant  
Dr. Vicki Chandler  
Dr. Elaine Jacobson  
Dr. Rodney Adam  
Dr. Paul McDonagh  
Dr. Theodore Glattke

***UBRP VISITING STUDENT RESEARCHERS***  
**2004**

**BRAVO!**

**SUSHEELA CARROLL**

The Queen's University Environmental Science and Technology Research (QUESTOR)  
Northern Ireland

Worked with Dr. Michael Larkin in the Department of Microbiology

**AMANDA CASALE**

The Netherlands Institute for Brain Research  
The Netherlands

Worked with Dr. Cyriel Pennartz in the Department of Cognitive Neuroscience

**SAM DAY**

Cambridge University  
England

Worked with Dr. Kevin Brindle in the Department of Biochemistry

**STEPHANIE FREEMAN**

Wageningen University  
The Netherlands

Worked with Dr. Alfons Stams in the Laboratory of Microbiology

**MELBA JARAMILLO**

CSIRO Livestock Industries  
Australia

Worked with Dr. John Lowenthal in the CSIRO Australian Animal Health Laboratory

**KATHRYN MILLER**

Universidad Peruana Cayetano-Heredia and PRISMA  
Lima, Peru

Worked with Dr. Robert Gilman in the Department of International Health

**DANIELLE NEVAREZ**

Instituto de Biología Molecular y Celular de Plantas  
Valencia, Spain

Worked with Dr. Cristina Ferrandiz in the Department of Developmental Biology

**PIETER ROWLETTE**

Wageningen University  
The Netherlands

Worked with Dr. Piet Lens in the Laboratory of Microbiology

**MICHAEL SCHANER**

University of Cambridge  
England

Worked with Dr. Barry Everitt in the Department of Experimental Psychology

**REINA WATANABE**

CHU Dupuytren  
France

Worked with Dr. Marc Laskar in the Department of Thoracic and Cardiovascular Surgery

**MEGAN WILSON**

Institute of Microbiology, Academy of Science of the Czech Republic  
Czech Republic

Worked with Dr. Renata Stepankova in the Department of Immunology and Gnotobiology

***BRAVO! DATABLITZES 2004***

**DANIELLE NEVAREZ**

BRAVO! Participant

**“Analyzing Fruit Development in Arabidopsis Around Siestas in Spain”**

and

**LEAH TATUM**

BRAVO! Participant

**“Alzheimer’s, Art, and Coffee: A BRAVO! Experience in Florence Italy”**

February 13, 2004

**KELLY MILLER**

Visiting UBRPer from Dartmouth College, Hanover, New Hampshire

**“Protein and mRNA c-myc and NM23-H2 Levels of Oncogenes in Several Human Tumor Cell Lines”**

and

**BARBORA SEBESTOVA**

Foreign Visiting Scholar from the University of South Bohemia, Ceske Budejovice, Czech Republic

**“Giardia D uodenalis in Dogs in Arizona and Czech Republic”**

March 12, 2004

**SUSHEELA CARROLL**

BRAVO! Participant

**“No Troubles with “Troubles:” Purifying Halotolerant Amidases in Northern Ireland”**

and

**AMANDA CASALE**

BRAVO! Participant

**“Characterizing the Interactions of Connected Brain Structures  
During Learning and Memory Consolidation”**

September 17, 2004

**MELBA JARAMILLO**

BRAVO! Participant

**“Chicken Anemia Virus: Finding the Mechanism of Infection”**

and

**MICHAEL SCHANER**

BRAVO! Participant

**“From the Lab to the Pub: Pavlovian Conditioning  
and Culture at Cambridge University”**

October 11, 2004

**REINA WATANBE**

BRAVO! Participant

**“Neurological Complications of Cardiac Valve Surgery”**

and

**KATHRYN MILLER**

BRAVO! Participant

**“Pisco, Papas, and Parasites: My Summer in Peru”**

October 21, 2004

**SAM DAY**

BRAVO! Participant

**“Imaging Gene Expression *in vivo*: Development of an MRI Applicable Gene Reporter”**

and

**MEGAN WILSON**

BRAVO! Participant

**“Your Diet, Your Guts, and Your Health” A Summer Study in the Czech Republic”**

November 10, 2004

*EXPLORING TRANSLATIONAL RESEARCH AND MEDICINE  
(ExTrReMe) SEMINARS  
2004*

**DR. LINDA RESTIFO**

Associate Professor, Neurobiology and UBRP Faculty Sponsor

**“Bridge Over Troubled Waters, The Cultural Divide Between Science and Medicine:  
Barriers to Translational Research?”**

January 22, 2003

**DR. RICH JORGENSEN**

Professor, Plant Sciences and UBRP Faculty Sponsor

**“Of Plants and Men: Gene Silencing”**

February 26, 2003

**DR. JOHN C. RACY**

Professor, Psychiatry

**“Humanism and Medicine in the Real World”**

March 26, 2003

*UBRP SEMINARS 2004*

**DR. ROBERT PLOMIN**

Professor, Institute of Psychiatry at King's College, London, England

**“Beyond the Nature Nurture Debate”**

March 4, 2004

**and**

**“Generalist Genes for Learning Disabilities”**

March 5, 2004

**DR. ELIZABETH MACNEILL**

Medical Director, Pima County Health Department

**“Smallpox Immunization: The Pros and Cons”**

June 17, 2004

**DR. MICHAEL WELLS**

Regents Professor Biochemistry and Molecular Biophysics

**“Elements of a Scientific Poster”**

June 24, 2004

**DR. MICHAEL WELLS**

Regents Professor Biochemistry and Molecular Biophysics

**“Making a Scientific Presentation”**

July 1, 2004

**DR. LINDA RESTIFO**

Associate Professor, Neurobiology and UBPR Faculty Sponsor

**“Bridge Over Troubled Waters, The Cultural Divide Between Science and Medicine”**

July 15, 2004

**DR. STUART RAVNIK**

Assistant Dean of the Graduate School of Biomedical Sciences,  
University of Texas Southwest Medical School , Dallas, Texas

**“Why Do Science? Getting to that Eureka Moment”**

July 28, 2004

**BRIAN HAWKINS AND JULIE BORDOWITZ**

PhD Students

and

**DR. CAROL GREGORIO**

Associate Professor, Cell Biology & Anatomy and UBPR Faculty Sponsor,



and

**DR. STUART RAVNIK**

Assistant Dean of the Graduate School of Biomedical Sciences,  
University of Texas Southwest Medical School , Dallas

**“Unraveling the Mysteries of Graduate School”**

July 29, 2004

**DR. MARK WITTEN**

Research Professor, Pediatrics/Pharmacology & Toxicology  
and UBRP Faculty Sponsor

**“Tungsten and Childhood Leukemia:  
A Study of Five Cities in the Western United States”**

August 5, 2004

**DR. RENATO CORRADETTI**

Professor, Department of Preclinical and Clinical Pharmacology,  
University of Florence, Florence, Italy

**“Role of the Serotonin System in the Actions of Antidepressant Drugs and 3,4-  
methylenedioxymethamphetamine (MDMA; ‘Ecstasy’)”**

October 6, 2004

**S. KENT KEMMISH**

UBRPer in Dr. Danny Brower’s Laboratory, Molecular & Cellular Biology

and

**DANIEL WOOD**

UBRPer in Dr. Jesse Martinez’s Laboratory, Pediatrics

**“Research Presentations with a Critique by  
Dr. Bruce Patterson, Molecular & Cellular Biology”**

October 25, 2004

*UBRP SEMINARS 2004, continued*

**DR. GIANCARLO PEPEU**

Professor, Department of Preclinical and Clinical Pharmacology,  
University of Florence, Florence, Italy and BRAVO! Faculty Sponsor

**“From Caffeine Consumption to the Therapy of Parkinson’s Disease”**

November 2, 2004

*UBRP FIELD TRIPS AND SOCIAL ACTIVITIES  
2004*

- May                      BioEthics Retreat
- Arizona-Sonora Desert Museum Tour
- June                     Annual Saguaro Harvest with Stella Tucker, our Tohono O'odham guide
- Tumacacori National Historical Park Mission/River Ecology/Tubac
- Hike: Mt Lemmon and Summerhaven
- July                      Movie Night: Adrenoleukodystrophy and Lorenzo's Oil
- Discussion Leader: Dr. Robert Erickson, Pediatrics
- August                  Tour: Southwest Environmental Health Sciences Center (SWEHS)
- Cellular Imaging Core
- Tour: Steward Observatory Mirror Lab Tour
- Tour: SWEHS Proteomics Core Facility
- Tour: SWEHS Genomics Core Facility
- Poster Session and Closing Ceremony for NSF REU Students
- October                 Workshop: The Impact of the Environment on Health in Ambros Nogales,  
                              Mexico
- Movie Night: Eternal Sunshine of the Spotless Mind
- Discussion Leader: Dr. Renato Corradetti, Department of Preclinical and  
                              Clinical Pharmacology, University of Florence, Florence, Italy

## DONORS TO THE UNDERGRADUATE BIOLOGY RESEARCH PROGRAM 2004

Contributions to the Undergraduate Biology Research Program came from three sources this year: contributions from program alumni in response to our appeal to build an endowment; contributions through the University's annual fundraising campaign; and contributions in memory of Dr. David C. Rowe, longtime UBRP faculty sponsor and world-renowned behavior geneticist, who died February 2, 2003. List is updated through December 16, 2003.

### *Contributions from Alumni*

Mr. Jayesh Ramsinghani

### *UA Cares Campaign*

Carol Bender

### *Contributions in Memory of Dr. David C. Rowe*

Dr. and Mrs. David Allison	Dr. John and Mrs. Jannette Law
Mr. And Mrs. Phillip Austin	Drs. Yeong-Hau and Li-Wen Lai
Dr. David Bellows	Dr. Mary Beth Marks
Mr. And Mrs. Robert Bender	Dr. Brint Milward and Mrs. Jill Bemis
Ms. Susan Bennett	Ms. Kerri Modry
Blair Corporation	Dr. Hiroshi Nakato
Dr. Richard Bootzin	Mr. and Mrs. Lee Olitzky
Mrs. Lorene Calder	Drs. Wayne Osgood and Jan Jacobs
Dr. Rochelle Canter	Ms. Risa Owens
Mr. And Mrs. John Carlson	Dr. John Palmer
Mr. Brian Catts and Mrs. Roxie Catts	Ms. Maxine Phillips
Dr. Donna Christensen and Mr. Brian Christensen	Drs. Gene Sander and Louise Canfield
Dr. James Clarke	Dr. Paul Schenker
Dr. and Mrs. Christopher Cunniff	Ms. Ellen Shenkarow
Dr. Lee Ellis	Drs. Eric and Andrea Schindler
Dr. and Mrs. Robert Erickson	Dr. Justin Schmidt
Ms. Susan Felsenfeld	Drs. Nick and Camilla Strausfeld
Genentech, Inc.	Dr. Shirley Jo Taylor
Mr. James George Jr.	Drs. Leslie Tolbert and Paul St. John
Ms. Anne Gowin	Mr. and Mrs. Charles Van Norden II
Ms. Patricia Gross	Dr. Judith Ulreich
Ms. Judy Harris	Dr. Elizabeth Vierling
Drs. Jennifer Hall and David Mount	Ms. Virginia Vorhis
Drs. Martha Hawes and Hans Van Etten	Mr. and Mrs. Douglas Wylie
Ms. Colleen Horne	Mr. Jon and Mrs. Karen Young
Mr. Edvard Jorgensen	Mr. and Mrs. John Zawacki
Dr. and Mrs. Keisuke Kamimura	
Dr. Charles and Mrs. Pam Katzenberg	
Dr. Christina Kennedy	
Mr. and Mrs. Edward Kenney	
Dr. Denise Krawitz	

Contributions to the program can be made at any time and are deeply appreciated. Our long range goal is to build an endowment for UBRP so that future UA students will have the opportunity to learn science by doing

research. Checks should be made payable to “The University of Arizona Foundation” and “UBRP Fund” should be written in the memo section of the check. Checks can be sent to the College of Science Development Office, Gould Simpson, room 1025, PO Box 210077, The University of Arizona, Tucson, AZ 85721-0077.

III.

*OUTREACH PROGRAMS*

*IN*

*BIOLOGY*

## THE MANDUCA PROJECT

For the past thirteen years, the Department of Biochemistry has been engaged in an elementary school, educational outreach program known as “The Manduca Project.” The program was developed through the collaborative efforts of many teachers and scientists. Development was guided by the philosophy that teachers are the educational experts and scientists are resources ripe for exploitation. The Manduca Project, although originally intended as a science project on insect development, has evolved into an integrative program involving lessons in mathematics, art, science, computer technology, and the language arts. Graduate students and research associates, especially women and Hispanic scientists, routinely visit the local schools to provide information and to serve as role models. Since its inception, hundreds of children have taken part in the project. Teachers report that the children become so excited with the caterpillars and their lessons that they involve their parents in the project.

Additional information on the Manduca Project can be found on the web: <http://www.manducaproject.com>. Elementary school teachers can obtain the knowledge and materials to conduct the project in their classrooms, including where to order *Manduca sexta* eggs and diet.

In July 2004, a weeklong workshop for elementary school teachers was offered at the University, taught by TUSD teacher, Patricia Weaver, Curriculum Specialist at Mission View Elementary School, and TUSD teacher, Cecilia Valenzuela, Davis Bilingual Elementary School, assisted with the planning/preparation. Both teachers have considerable experience in running this project and have developed a broad range of interdisciplinary approaches to the study of the *Manduca sexta* and its life cycle in the elementary curriculum. Fourteen teachers from 11 elementary schools and three school districts participated. Listed below are the teachers who took the summer workshop.

### 2004 Manduca Project Teachers

Sheri Gordon – DeGrazia Elementary School  
Ruth Gerhart – Roadrunner Elementary  
Heather Hadler – Estes Elementary School  
Jeanie Hamon – Dunham Elementary School  
Selina Johnson – UA/SAMEC  
Jo Ann Lee – Wright Elementary School  
Charles Lemley – Tanque Verde School District  
Sheri Marlin – Borton Elementary School  
Marilyn McClure – Hollinger Elementary School  
Carolyn Mongeon – Johnson Elementary School  
Ashley Simmons – Magee Middle School  
Barbara Toothman – Roadrunner Elementary School  
Kelly Tracy – Estes Elementary School  
Maria Valencia – Hollinger Elementary School

## ***VISITING STUDENT RESEARCHERS SUMMER 2004***

The Undergraduate Biology Research Program, in an effort to make the resources of this institution available to undergraduate science majors at other institutions, particularly small liberal arts colleges, offers a 12-week summer research program for non-UA students. Funding for this program comes from the National Science Foundation and the American Society for Pharmacology and Experimental Therapeutics.

Listed below are the students who were Visiting Student Researchers for 2004, with their home institutions and UA faculty sponsors.

### **Melissa Callahan**

Lewis & Clark College, Oregon  
Dr. Michael Wells, Biochemistry and Molecular Biophysics

### **Genevieve Cheng**

Muhlenberg College, Pennsylvania  
Dr. Alan Nighorn, ARL-Neurobiology

### **Megan Gingrich**

Skidmore College, New York  
Dr. Hanna (Johnny) Fares, Molecular & Cellular Biology

### **Nora Gutierrez**

University of St. Thomas, Texas  
Dr. Katerina Dvorakova, Pediatrics

### **Kelly Miller**

Dartmouth College, New Hampshire  
Dr. Laurence Hurley, Pharmacology/Toxicology

### **David Mosley**

University of Florida, Florida  
Dr. Jamie Collins, Pediatrics

### **Miriam Schoenfield**

Brandeis University, Massachusetts  
Dr. Konrad Zinsmaier, Chemistry



**Shubin Shahab**  
Georgia Institute of Technology, Georgia  
Dr. Robert Erickson, Pediatrics

## ***SCIENCE CONNECTION***

Science Connection, initiated in 1991 by UBRP participant Robert West, is an outreach program to pre-college classrooms in the Tucson metropolitan area that is in its 14th year. The goal of Science Connection is to help undergraduates share their enthusiasm for science with children and to make the undergraduates aware of current issues in science education and teaching as a possible career choice. The main thrust of the program is for undergraduate students to visit local schools to do hands-on science activities on topics that range from astronomy through zoology. Information about the course (MCB 491) and volunteer program can be found at the Science Connection webpage <<http://sciconn.mcb.arizona.edu/>>.

### ***2004 Science Connection Participants***

Diana Acuna	Stefanie Mares
Justin Bartel	Daniel Martinez
Brynne Crowell	Russell Means
James Deer	Linh Nguyen
Samira Ehteshami	Nguyen Nguyen
Molly Engelhard	Cynthia Perry
Amber Franklin	Valerie Piotrowski
Mikhal Gold	Guadalupe Romero
Veronica Gonzalez	Shahnaz Sadeghi-mirmobi
Susan Greenhut	Kriston Schellinger
Laura Hall	Dino Subasic
Christopher Hammond	Cindy Taylor
Ehsan Heidari	H. Dominique Trujillo
Amir Hobheidar	Natasa Vojvodic
Emily Julien	Julia Weakley
Jooyoung Kim	Stephanie Woo
Rupa Krishna	