

***10th ANNUAL UNDERGRADUATE
RESEARCH SYMPOSIUM IN THE
CHEMICAL AND BIOLOGICAL
SCIENCES***

Hosted by

**Department of Chemistry and Biochemistry
Department of Biological Sciences
University of Maryland, Baltimore County**

Saturday, October 13, 2007



***Sponsored in part through the generosity of
Procter & Gamble
and
The National Institutes of Health
(NIGMS)***

**10th Annual Undergraduate Research Symposium
in the
Chemical and Biological Sciences**

Poster Session I

(A) Chemical Sciences 1

1st Place QUANTIFYING THE CADMIUM OVER CALCIUM ION SELECTIVITY OF [BHEDTC]⁻ AND [BHEXAN]⁻

Eric M. Lemmon

Peter R. Craig

Department of Chemistry, McDaniel College,
2 College Hill, Westminster MD 21157

2nd Place EVALUTAION OF WASTEWATER QUALITY FROM WASTEWATER STABILIZATION PONDS

Rukundo Kambarami

Dr S. V. Manyele

Department of Chemical and Process Engineering, University of Dar es Salaam,
Tanzania, Department of Chemistry and Biochemistry, Hood College, 401
Rosemont Ave Frederick, Maryland 21701

(B) Chemical Sciences 2

1st Place INFRARED SPECTROSCOPY OF BIOMIMETIC CATALYSTS FOR HYDROGEN PRODUCTION

Benjamin W. Caplins, Tiffany A. Gutowski, *Christopher J. Stromberg*

Hood College, Frederick, Maryland

Edwin Heilweil

National Institute of Standards and Technology, Gaithersburg, Maryland

2nd Place DEVELOPMENT OF SERS/FLUORESCENCE BIONANOPROBES FOR SUPERIOR DETECTION OF TOXIC MATERIALS

Nicole Whitten, Dimitra Stratis-Cullum^{*}, Troy Alexander^{*}

Brian Cullum

Department of Chemistry and Biochemistry, University of Maryland Baltimore
County

1000 Hilltop Circle, Baltimore, MD 21250

^{*}US Army Research Laboratory, 2800 Powder Mill Rd., Adelphi, MD 20783

(C) Chemical Sciences 3

1st Place CHARACTERIZING THE PHYSICAL PROPERTIES OF POLYMERIC TISSUE ENGINEERING SCAFFOLDS

Robert Reeves, Silviya Petrova
Jennie B. Leach
Department of Chemical and Biochemical Engineering
University of Maryland, Baltimore County
1000 Hilltop Circle
Baltimore, MD 21250

2nd Place TEMPLATED CRYSTAL GROWTH OF DIPHENYL UREAS

Katrina J. Heyrana, Christina A. Capacci, and Jennifer A. Swift
Department of Chemistry, Georgetown University, 37th and "O" Streets NW,
Washington, DC 20057

(D) Chemical Sciences 4

1st Place DEVELOPMENT OF A PAGE-AAS ASSAY FOR METALLATION OF DNA BY CISPLATIN AND ITS ANALOGS

Kevin Hopkins and Adam Cassano
Department of Chemistry, Drew University,
36 Madison Avenue, Madison, New Jersey, 07940

2nd Place MECHANISTIC STUDIES IN ENAMINE ORGANOCATALYSIS: A SIMPLE ASSAY FOR IDENTIFYING KINETICALLY CONTROLLED ORGANOCATALYSIS

Nathaniel Bair and Timothy J. Peelen
Department of Chemistry, Lebanon Valley College, 101 N. College Ave.,
Annville, PA 17003

(E) Biological Sciences 1

1st Place INCREASED HEART CELL VIABILITY WITH EPICATECHIN WHEN EXPOSED TO HYDROGEN PEROXIDE

Vanessa Jane Quito
Dr. Madeline Mignone
Department of Biology, Dominican College,
470 Western Highway, Orangeburg, New York 10962

2nd Place GENETIC AND PHENOTYPE MAPPING OF A NOVEL
NEURODEGENERATIVE MUTATION AND CHARACTERIZATION OF ITS
PATHOLOGY

Sylvia K. Dasi

Dr. Susan Ackerman

Department of Natural Sciences, University of Maryland Eastern Shore, Princess
Anne, Maryland 21853

Howard Hughes Medical Institution and The Jackson Laboratory 600 Main St.
Bar Harbor, Maine 04609-1500

(F) Biological Sciences 2

1st Place IN VIVO ANTIMALARIA ACTIVITY OF MARANTHES *FLORIBUNDA*
ROOT ETHANOLIC

Fulgentia N.Gang

Dr. M. J Moshi, Dr. P Masimba

Institute of Traditional Medicine, Muhimbili University College of Health
Sciences, Dar es salaam, Tanzania

2nd Place IDENTIFYING NOVEL CELL CYCLE REGULATORS IN BUDDING YEAST

Tesia Stephenson¹, Paula Fearon^{*}, and *Orna Cohen-Fix^{*}*

¹University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD
21250, ^{*}Laboratory of Molecular and Cellular Biology, NIDDK, NIH, Bethesda,
MD 20892

(G) Biological Sciences 3

1st Place IDENTIFYING BIOMARKERS OF THE MHC GENE TO INVESTIGATE
CHEMOSENSORY DISCRIMINATION

Tyler C. Bazzoli

Dr. Steven D. Brown

Department of Chemistry and Biochemistry, University of Delaware, 210 Drake
Laboratory, Newark, Delaware 19716

2nd Place ANALYSIS OF THE MICROBIAL COMMUNITY IN A WASTEWATER
SEQUENCING BATCH REACTOR

Brittane Strahan

Jeffrey D. Newman

Biology Department, Lycoming College
700 College Place, Williamsport, PA 17701

(H) Biochemistry and Molecular Biology 1

1st Place THE INVESTIGATION OF TOXIC CROTAMINE FOR DRUG DELIVERY

Pei-Chun Chen

Dr. Richard Karpel

Department of Chemistry and Biochemistry, University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, Maryland 21250

2nd Place INVOLVEMENT OF CYSTATIN C AND CATHEPSIN D IN OXIDATIVE STRESS-INDUCED CELL DEATH FOLLOWING H₂O₂ EXPOSURE

Rachel A. Addo

Dr. Donald Palm, Dr. LeeShawn Thomas, Basil Smith

University of Maryland Eastern Shore, Department of Natural Sciences, Princess Anne, Maryland

(I) Biochemistry and Molecular Biology 2

1st Place THE ROLE OF CDK5 IN NON-NEURONAL TISSUES

Jessica Stevens

Dr. Ann Aguanno

Department of Natural Sciences, Marymount Manhattan College
221 East 71st St. New York, NY 10021

2nd Place EXPRESSION AND PURIFICATION OF ZINC FINGER ANTIVIRAL PROTEIN ZINC BINDING DOMAIN

Irena Antic

Dana C. Lawrence

Department of Chemistry and Physics, Hood College, 401 Rosemont Avenue, Frederick, Maryland, 21701

(J) Biochemistry and Molecular Biology 3

1st Place ANALYSIS OF MUTATIONS IN RIBOSOMAL PROTEINS L4 AND L22 IN SPIRAMYCIN-RESISTANT *DEINOCOCCUS RADIODURANS*

Andrew M. Ciupek, Department of Biological Sciences, University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250

Janice M. Zengel, Senior Research Scientist, Department of Biological Sciences, University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250

2nd Place ANALYSIS OF APOPTOSIS IN HUMAN UMBILICAL VEIN CELLS EXPOSED TO HOMOCYSTEINE

Alyssa Childers, Holly DeBolt, Bonnie Freeman, Adam Hamrick, Jess Cunnick, Sarah Dodson, and *Mark Flood*

Department of Biology, Chemistry and Geoscience, Fairmont State University, 1201 Locust Avenue, Fairmont, West Virginia 26554

(K) Biochemistry and Molecular Biology 4

1st Place A MS-BASED ASSAY FOR ASSESSING RIBOSOMAL READTHROUGH IN MOLONEY MURINE LEUKEMIA VIRUS

Wayne Chang; Arie Hawkins, *Daniele Fabris*

Department of Chemistry and Biochemistry, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, Maryland 21250

2nd Place THE USE OF A PEPTIDE PHAGE DISPLAY LIBRARY TO PROBE DOMAIN INTERACTIONS IN *E. COLI* GMP SYNTHETASE

Gary Lam and Julia A. Cupp

Walter A. Patton

Department of Chemistry & Program in Biochemistry and Molecular Biology Lebanon Valley College, Annville, PA 17003

(L) Biochemistry and Molecular Biology 5

1st Place THE IDENTIFICATION OF PDZ-DOMAIN PROTEINS INTERATING WITH JAM-B

Ritika Samant

Ulhas P. Naik

Department of Biological Sciences, University of Delaware
118 Wolf Hall, Newark, Delaware 19716

2nd Place ISOLATION AND PURIFICATION OF VANADIUM HALOPEROXIDASE MUTANTS FOR CHARACTERIZATION BY ⁵¹V SOLID-STATE NMR

Kristin M. Nuzzio, Stephanie E. Bolte and *Dr. Tatyana Polenova*

Department of Chemistry and Biochemistry, University of Delaware, Newark DE 19716

Poster Session II

(A) Chemical Sciences 1

1st Place RUTHENIUM BIPYRIDINE COMPOUNDS AS SDS-PAGE- AND MALDI-COMPATIBLE PROTEIN LABELS

Charles R. Schmidt and Brandon W. Parks

Walter A. Patton

Department of Chemistry & Program in Biochemistry and Molecular Biology
Lebanon Valley College, Annville, PA 17003

2nd Place NICKEL(II) COMPLEXES OF A PYRIDYL-THIOETHER OXIME LIGAND

Huy A. Dao[†], *Michael J. Prushan*[†], *Matthias Zeller*[‡] and *Allen D. Hunter*[‡]

[†] Department of Chemistry & Biochemistry, La Salle University, Philadelphia, PA 19141

[‡] Department of Chemistry, STaRBURSTT-Cyberdiffraction Consortium at YSU and Department of Chemistry, Youngstown State University, Youngstown, OH 44555

(B) Chemical Sciences 2

1st Place METAL-ION PROMOTED PHOSPHODIESTER HYDROLYSIS

Brittany Kirk, Eric Laager, Evan Rochlis, Corey Cusack, and *Adam Cassano*
Department of Chemistry, Drew University,
36 Madison Avenue, Madison, New Jersey, 07940

2nd Place THE DEVELOPMENT OF REACTIONS OF ENAMINES WITH
FMOC-PROTECTED *N,O*-ACETALS

Daniel K. Hodge and *Timothy J. Peelen*
Department of Chemistry, Lebanon Valley College, 101 N. College Ave.,
Annville, PA 17003

(C) Chemical Sciences 3

1st Place Cu(II), Ag(I) and Pt(II) BIPYRIDINE OLIGOMER
METALLOMACROCYCLES THAT FUNCTION AS EFFICIENT HOST
COMPLEXES FOR THE ENCAPSULATION OF ALKALI ION GUESTS

Kenneth Houser, *Johanna Scarino*, and *Marc Harris**
Department of Chemistry, Lebanon Valley College, Annville Pennsylvania 17003

2nd Place ENANTIOSEPARATION OF PROFEN DRUGS BY CAPILLARY
ELECTROPHORESIS: USING VANCOMYCIN AND CYCLODEXTRIN AS
CHIRAL SELECTORS

Rebecca A. Hunter
Kevin H. Bennett
Department of Chemistry and Physics, Hood College, Frederick, MD 21701
Department of Chemistry, James Madison University, MSC 4501, Harrisonburg
22807

(D) Chemical Sciences 4

1st Place NOSYL AS AN EFFICIENT PROTECTING GROUP FOR THE SYNTHESIS OF BIPYRIDINE AZA-CROWN ETHER MACROCYCLES; AN ION ENCAPSULATION STUDY OF MACROCYCLIC AMINES

Timothy Garrett Jr., Marc Harris*

Department of Chemistry, Lebanon Valley College, Annville Pennsylvania

2nd Place RUTHENIUM COMPLEXES OF BIS(DIPHENYLPHOSPHINO)ETHANE MONOXIDE

Morgan L. Moyer

John W. Gilje & Donna S. Amenta

Department of Chemistry, James Madison University, MSC 4501, Harrisonburg 22807

(E) Biological Sciences I

1st Place INVESTIGATING HUMAN AND *DROSOPHILA* SPRINTER FUNCTION

Andrew Harmon and *Erica M. Selva*

Department of Biological Sciences, University of Delaware, Newark, DE 19716

2nd Place EFFECTS OF TEMPERATURE ON RECOMBINATION IN NEMATODE *C.ELEGANS*

Jaclyn Lim^{1,2}, *Rachel Webster*², *Judith L. Yanowitz*²

¹Dept. of Biology, Johns Hopkins University, 3400 N. Charles St., Baltimore, MD 21218 ²Dept. of Embryology, Carnegie Institution of Washington, 3520 San Martin Drive, Baltimore, MD 21218

(F) Biological Sciences 2

1st Place HEARING LOSS AFFECTS THE EXPRESSION OF NEURONAL NEUROTRANSMITTER RECEPTORS AND GLIAL CYTOSKELETAL PROTEINS IN THE COCHLEAR NUCLEUS

Kristin H. Slagle

Maria E. Rubio

Department of Physiology and Neurobiology, University of Connecticut
75 North Eagleville Road, Storrs, CT 06269

Department of Biology, Drew University
36 Madison Avenue, Madison, NJ 07940

2nd Place ROLES OF CA²⁺/H⁺ EXCHANGERS AND GLUTAMATE RECEPTOR
HOMOLOGS IN *ARABIDOPSIS* GUARD CELL SIGNALING

YouJin Seo

Department of Cell Biology and Molecular Genetics, University of Maryland,
College Park

University of Maryland, College Park, MD 20742

(G) Biological Sciences 3

1st Place EVALUATING THE ROLE OF STORM WATER RETENTION BASINS IN
THE FATE OF ROADWAY DERIVED ZINC

Valerie A. Schmidt¹ and Robert F. Flora²

*Ryan E. Casey*¹ and *Steven M. Lev*²

¹Department of Chemistry, Towson University, 8000 York Road Towson,
Maryland 21252

²Department of Physics, Astronomy, and Geosciences, Towson University, 8000
York Road Towson, Maryland 21252

2nd Place AIR POLLUTION CONTROL MEASURES AND RESPONSE IN AQUATIC
CHEMISTRY IN AN ACID SENSITIVE TROUT STREAM

Michelle L. Bender

Dr. Daniel M. Downey

Department of Chemistry and Biochemistry, James Madison University,
MSC 4501 Harrisonburg, Va 22801

(H) Biochemistry and Molecular Biology 1

1st Place THE ROLE OF A REPLICATION CONTROL ELEMENT APPEARS TO BE
DEVELOPMENTALLY MODULATED IN *TRYPANOSOMA BRUCEI*

Mark Sauchelli, Charleen Hunt, Amin Espinal, Jedidiah Quijano, Mario Sampson,
Robert Lorenzo, Christopher Mulligan and *Pradeep Patnaik*

Department of Biology, William Paterson University, Wayne, NJ 07470

2nd Place MUTATIONAL ANALYSIS OF SELECTED RESIDUES IN THE J-DOMAIN AND HINGE REGION OF SV40 LARGE TUMOR ANTIGEN

Krista Neal, Kristi Clark

Dr. Daniel T. Simmons

Department of Biological Sciences, University of Delaware,
257 McKinly Laboratory, Newark, DE 19717

(I) Biochemistry and Molecular Biology 2

1st Place G-QUADRUPLEXES ARE CONSERVED NEAR RNA PROCESSING SITES OF PROTO-ONCOGENES

Melissa HeeChung, Gadareth Higgs, Aileen Tolentino, *Lawrence D'Antonio* and *Paramjeet Bagga*

Bioinformatics, School of Theoretical and Applied Sciences,
Ramapo College of New Jersey, Mahwah, NJ 07430

2nd Place CLONING, EXPRESSION, AND CHARACTERIZATION OF MELANOPSIN FROM BOVINE RETINA

Sarah Bourdon

Joe Blasic and Phyllis Robinson

Department of Biological Sciences, University of Maryland Baltimore County,
1000 Hilltop Circle, Baltimore, MD 21250

(J) Biochemistry and Molecular Biology 3

1st Place PURKINJE NEURON DENDRITE STRUCTURE: REGULATION BY THE MAP AND PI-3 KINASE PATHWAYS

Ashley M. Campbell & *Mary E. Morrison, Ph.D.*

Biology Department, Lycoming College, Williamsport, PA 17701

2nd Place PROBING THE COUNTERION TO THE PROTONATED SCHIFF BASE IN MELANOPSIN

Tanu Sharma and Marquis T. Walker

Phyllis R. Robinson

Department of Biological Sciences, University of Maryland, Baltimore County,
1000 Hilltop Circle, Baltimore, MD 21250

(K) Biochemistry and Molecular Biology 4

1st Place ANALYZING THE INTERACTION BETWEEN THE MHC II
TRANSCRIPTION FACTORS, CREB AND RFX5

Olufolakemi Awe

Colin Garvie

Department of Chemistry and Biochemistry, University of Maryland Baltimore
County, 1000 Hilltop Circle, Baltimore, Maryland 21250

2nd Place CLONING AND EXPRESSION OF ZINC-FINGERS 1 AND 2 FROM ZINC-
FINGER ANTIVIRAL PROTEIN

Shannon L. Barton¹, Dana C. Lawrence¹, and Michael F. Summers²

¹Hood College, Frederick, Maryland

²Howard Hughes Medical Institute, UMBC, Baltimore, Maryland

(L) Biochemistry and Molecular Biology 5

1st Place INVESTIGATION OF PROTEIN EXPRESSION IN MOUSE SPERMATOZOA

Tyanna N. Hadley, *Thomas J. Diefenbach, PhD*, David E. Clapham, MD/PhD

Department of Cardiology, Harvard Medical School

300 Longwood Drive, Boston, MA 02115

2nd Place A NOVEL APPROACH TO ALTERING ESTROGEN RECEPTOR FUNCTION

Tara Rhoades

John Koh

Department of Chemistry and Biochemistry, University of Delaware, Newark,
DE, 19716