

**6th Annual Undergraduate Research Symposium
in the
Chemical and Biological Sciences**

Poster Session I

(A) Chemical Sciences 1

1st Place ION-PAIRING REVERSED-PHASE HIGH PERFORMANCE LIQUID
CHROMATOGRAPHY FOR THE SEPARATION AND PURIFICATION
OF *IN VITRO* TRANSCRIBED RNA STRANDS

Samuel Merenbloom, Dan Fabris
Department of Chemistry and Biochemistry, University of Maryland,
Baltimore County, 1000 Hilltop Circle, Baltimore, Maryland 21250

2nd Place MULTI-PHOTON PHOTOACOUSTIC SPECTROSCOPY FOR NON-
INVASIVE TISSUE DIAGNOSIS

Ronak H. Mehta, Nirmala Chandrasekharan, Veena Rao, and Brian
Cullum
Department of Chemistry and Biochemistry; UMBC,
1000 Hilltop Circle; Baltimore, MD 21250

(B) Chemical Sciences 2

1st Place ALKYLATION OF 2'-DEOXYADENOSINE BY N-PROPYL DIAZONIUM
ION

Jacqueline M. Heilman, James C. Fishbein
Department of Chemistry and Biochemistry, University of Maryland,
Baltimore County, 1000 Hilltop Circle, Baltimore, Maryland 21250

2nd Place HYDROGEN BONDING AND PROTON TRANSFER IN SMALL HALIDE
MOLECULES

Jacqueline Keighron, Dr. Carl Salter
Chemistry Department, Moravian College, 1200 Main Street,
Bethlehem, PA 18018

2nd Place CHARACTERIZATION OF THE EPOXY POLYMERIZATION PROCESS

Janine Nunes, Dr. Alvin P. Kennedy, Solomon Tadesse
Department of Chemistry, Morgan State University, Baltimore MD 21251

(C) Chemical Sciences 3

1st Place COMPARISON OF METHODS FOR THE SYNTHESIS OF CIS-SUBSTITUTED ALKENES

T. Grove, D. DiLella, *E. J. Volker*,
Department of Chemistry, Shepherd College, Shepherdstown, WV 25443

2nd Place TANDEM HYDROACYLATION-MICHAEL ADDITION IN THE SYNTHESIS OF PHARMACUETICAL PRECURSORS

Daniel A. DiRocco, *Dr. Holly D. Bendorf*
Chemistry Department, Lycoming College, 700 College Place,
Williamsport, Pennsylvania, 17701 USA

(D) Chemical Sciences 4

1st Place SOL-GEL ENCAPSULATED PROBE SENSOR FOR SMALL, BIOLOGICALLY IMPORTANT MOLECULES

Delisa McEwan, *Dr. Maurice O. Iwunze*
Department of Chemistry, Morgan State University,
Baltimore, MD 21251, USA

2nd Place THE REACTION BETWEEN 1-PROPANOL AND COPPER (I, II) OXIDE

Michael E. Peretich and *T.C. DeVore*
Department of Chemistry MSC 7701, James Madison University
Harrisonburg, VA 22807

(E) Biological Sciences 1

1st Place EFFECTS OF RETINOL AND PHYTOL ON METAMORPHOSING ANURAN TADPOLES, *XENOPUS LAEVIS*.

Darci Gresko and *Jaishri Menon*
Department of Biology, William Paterson University of New Jersey,
Wayne, NJ

2nd Place ARE THERE PERFORMANCE TRADEOFFS BETWEEN BLACKNOSE DACE (*RHINICHTHYS ATRATULUS*) FROM URBAN AND RURAL STREAMS?

Kirk Gastrich, Mentor: Jay Nelson
Department of Biological Sciences, Towson University,
Towson, Maryland

(F) Biological Sciences 2

1st Place THE APPLICATION OF MOLECULAR ASSAYS IN STUDIES OF MALARIA

Lorraine K. Beraho¹, Shannon Takala², *Christopher V. Plowe*²

¹Department of Biological Sciences, University of Maryland, Baltimore County(UMBC), 1000 Hilltop Circle, Baltimore, MD 21250

²Malaria Section, Center for Vaccine Development, University of Maryland School of Medicine, 685 West Baltimore Street, Baltimore, MD 21201-1509

2nd Place EFFECTS OF L-GLUCOSE ON BEHAVIOR FOLLOWING HEPATIC VAGOTOMY OR CELIAC GANGLIONECTOMY

Mary E. Guldin, *Cheryl P. Talley*, Alexander A. Simakov

School of Psychology, MSC 7401, James Madison University, Harrisonburg, VA 22801

(G) Biological Sciences 3

1st Place THE COMPARATIVE QUALITIES OF DHA ON MURINE TUMOR CELLS AND FISH CELLS OR VARYING TEMPERATURES

Meagan Orth and *Dr. Eugene Williams*

Department of Biological Sciences, Salisbury University
1101 Camden Ave., Salisbury, MD 21801

2nd Place THE EFFECT OF CHEMICAL CUES IN ARTIFICIAL BLOOD ON BEHAVIORAL CHOICE IN THE MEDICINAL LEECH

Nicole Pietras and *Peter D. Brodfuehrer*

Dept. of Biology, Bryn Mawr College, 101 N. Merion Ave, Bryn Mawr, PA, 19010

(H) Biological Sciences 4

1st Place STAT6-DEFICIENCY ENHANCES IMMUNITY TO MAMMARY CARCINOMA IN HER2/NEU TRANSGENIC MICE

Seth M. Miller¹, Cordula F. Davis², Samudra K. Dissanayake¹, *Suzanne Ostrand-Rosenberg*¹

Departments of Biological Sciences¹, and Chemistry and Biochemistry², University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250

2nd Place DISTRIBUTION OF ESTROGEN RECEPTORS IN THE THALAMUS OF POSTNATAL MALE AND FEMALE RATS AND ITS RELEVANCE TO AUTISM

Ashina Singh¹ and Mary Kritzer²

¹University of Maryland, Baltimore County (UMBC), Department of Chemistry and Biochemistry, Baltimore, MD 21250; ²State University of New York at Stony Brook, Department of Neurobiology and Behavior, Stony Brook, NY 11794

(I) Biochemistry and Molecular Biology 1

1st Place STUDYING THE CONSERVED NATURE OF RNASE MRP: THE EFFECTS OF MUTATING THE P4 HELIX OF RNASE MRP WITHIN *SACCHAROMYCES CEREVISIAE*.

Gilbert G. Jose, Lasse Lindahl, Janice Zengel.

Dept. of Biological Sciences, University of Maryland Baltimore County.
1000 Hilltop Circle, Baltimore, MD 21227

2nd Place FLUORESCENCE STUDIES OF FOLATE BINDING TO SERUM ALBUMIN

Martha Sachs, Justin Boer, and Steve Cessna

Department of Chemistry and Biochemistry, Eastern Mennonite University, 1200 Park Rd., Harrisonburg, Va 22802

(J) Biochemistry and Molecular Biology 2

1st Place STRUCTURAL INVESTIGATION OF THE MULTI-PROTEIN COMPLEX ASSOCIATED WITH THE BARE LYMPHOCYTE SYNDROME

Jason Stagno and Colin Garvie

Department of Chemistry and Biochemistry, University of Maryland Baltimore County, Baltimore, MD 21250

2nd Place GENERATION OF RECOMBINANT PROTEINS TO EXAMINE THE DIMERIC ORGANIZATION OF *E. COLI* GMP SYNTHETASE

Christine M. Lightcap[#], Jordan M. Newell^{*}, Sidney Pollack^{*} and Walter A. Patton[#]

Departments of Chemistry[#] and Biology^{*}, Lebanon Valley College, Annville, PA 17003-1400

(K) Biochemistry and Molecular Biology 3

1st Place ANTIVIRAL INHIBITION OF THE HIV-1 CAPSID PROTEIN

Chun Tang¹, Erin Loeliger¹, Isaac Kinde¹, Samson Kyere¹, Keith Mayo,²
Eric Barklis,² Yongnian Sun³, Mingjun Huang³ and *Michael F. Summers*^{1*}

¹Howard Hughes Medical Institute and Department of Chemistry and
Biochemistry, University of Maryland, Baltimore County, 1000 Hilltop
Circle, Baltimore, Maryland 21250-5398

²Vollum Institute and Department of Microbiology, Oregon Health &
Science University, 3181 SW Sam Jackson Park Road, Portland, Oregon
97201-3098

³Achillion Pharmaceuticals, 300 George Street, New Haven, CT 06511

2nd Place STUDIES ON THE SYNTHESIS OF SUBSTITUTED BICYCLIC
COMPOUNDS: POTENTIAL PROTEIN-PROTEIN INTERACTION
INHIBITORS

M. Grubisha, W. Xie, and *S. M. Firestine**

Undergraduate Research Program, Duquesne University, Pittsburgh, PA

(L) Biochemistry and Molecular Biology 4

1st Place CONSTRUCTION AND USE OF siRNA TO SILENCE GENE EXPRESSION

Ogechukwu Ndum¹, Peter Klein²

¹Department of Chemistry and Biochemistry, University of Maryland,
Baltimore County (UMBC), Baltimore, MD 21250; ²Departments of
Medicine and Cell and Developmental Biology, University of
Pennsylvania, Philadelphia, Pennsylvania 19104

2nd Place Fis1 BINDS Mdv1 AND Dnm1 TO REGULATE MITOCHONDRIAL
FISSION

David M. Merrick, Sarah Williams, and R. Blake Hill

Department of Biology, Johns Hopkins University, Baltimore, MD

(M) Biochemistry and Molecular Biology 5

1st Place INVESTIGATION OF CIITA TRANSPORT THROUGH REGULATING
TRANSCRIPTION

Christin A. Janczak and *Drew E. Cressman*

Department of Biology, Sarah Lawrence College, Bronxville, NY 10708

2nd Place ANATOMY OF REPLICATION CONTROL ELEMENTS IN *TRYPANOSOMA BRUCEI*

Amin Espinal, Mario Sampson, Jedidiah Quijano, Charleen Hunt,
Christopher Mulligan, Robert Lorenzo and *Pradeep Patnaik*
Department of Biology, William Paterson University, Wayne, NJ 07470

(N) Biochemistry and Molecular Biology 6

1st Place IDENTIFICATION OF CIS-REGULATORY ELEMENTS THAT CONTROL EXPRESSION OF THE PROSTATE SPECIFIC MOUSE GENE VPP1

DeAnna Baker^{*1}, Ryan McMullin¹, Judith Wubah², Laura Mutton¹,
*Charles Bieberich*¹
^{*}MARC U Star Student UMBC, ¹Department of Biological Sciences,
UMBC, 1000 Hilltop Circle, Baltimore, MD 21250; ²Department of
Biology, James Madsion University

2nd Place FUNCTIONAL ANALYSIS OF THE HUNTINGTON'S DISEASE GENE PROMOTER

Aliya L. Frederick¹, *Naoko Tanese*²
¹Department of Chemistry and Biochemistry, University of Maryland
Baltimore County (UMBC), Baltimore, MD 21250; ²Department of
Microbiology, New York University School of Medicine – Sackler
Institute, New York, NY 10016

**6th Annual Undergraduate Research Symposium
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Poster Session II

(A) Chemical Sciences 1

1st Place SYNTHESIS OF PHASE-STABLE AND ORIENTATIONALLY MOBILE AZO-CHROMOPHORES FOR APPLICATIONS IN BLENDED PHOTOREFRACTIVE POLYMER SYSTEMS.

Melissa Yang, *Dr James Fukunaga*,¹ *Dr David McGee*²
¹Department of Chemistry, ²Department of Physics, Drew University,
Madison, New Jersey 07940

2nd Place MAGNETRON SPUTTER DEPOSITION OF HfO₂ ON Si

Stuart Williams, *Dr. Brian Augustine*
Department of Chemistry, James Madison University

(B) Chemical Sciences 2

1st Place BIOLOGICAL PARTICLE ADHESION AND MATERIALS CHARACTERIZATION USING THE INDUCTIVELY COUPLED PLASMA MASS SPECTROMETER (ICP-MS)

Carolyn Gikunju¹, Michael Buck²
*Steven Lev*², *Amnon Birenzvig*³, *David M. Schaefer*²
¹Chemistry Department, Towson University, Towson, MD 21252
² Department of Physics, Astronomy, and Geosciences, Towson University, Towson, MD 21252
³SBCCOM Edgewood Facilities, Aberdeen Arsenal

2nd Place INVESTIGATION OF THE KINETICS OF THE PHOSPHITE SUBSTITUTION REACTIONS OF ALKOXY AND HALOGEN BRIDGED CLUSTERS OF TYPE OS₃(CO)₁₀(μ²-X)₂ WHERE X = I, BR, CL, OME, OET, O/PR, OT-BU, AND OPH

Brian Baum and *Mary-Ann Pearsall*
Chemistry Department, Drew University, 36 Madison Ave., Madison, NJ
07940

(C) Chemical Sciences 3

1st Place DETERMINATION OF TRACE CONCENTRATION OF METALS IN THE BOTTLED AND DRINKING WATER FROM COMMON HOUSEHOLD FAUCETS USING AN ELECTROCHEMICAL METHOD

Irwin Pascal , *Harini Patel, Hiroko I. Karan*
Department of Physical, Environmental and Computer Science
Medgar Evers College/CUNY, School of Science, Health and Technology
1150 Carroll Street, Brooklyn, NY 11225

2nd Place DECONVOLUTION OF MULTICOMPONENT MASS SPECTRA

Kedest Teshome and *Kevin H. Bennett*
Department of Chemistry & Physics, Hood College, Frederick MD 20701

(D) Chemical Sciences 4

1st Place DESIGN AND SYNTHESIS OF BIPYRIDINE CONTAINING AZA-CROWN-ETHER SENSORY MOLECULES

Gary Romberger, Amy Smith, Scott Wallace, and *Marc Harris*
Department of Chemistry, Lebanon Valley College, 101 N. College Ave.,
Garber Science, Annville, PA 17003

2nd Place SOLUTION PHASE PARALLEL SYNTHESIS OF A TWENTY-FOUR-MEMBER LIBRARY OF DITHIOCARBAMATE ESTER ANALOGS OF PIPERIDINE

Ravindra Gopaul., Nikki Handy, Jodiann Ledford and *Oladapo Bakare*
Department of Chemistry, Howard University, 525 College Street NW,
Washington DC 20059

(E) Biological Sciences 1

1st Place A GENOME-WIDE SCAN FOR LINKAGE IN FINNISH HEREDITARY PROSTATE CANCER (HPC) FAMILIES IDENTIFIES NOVEL SUSCEPTIBILITY LOCI AT 11q14 AND 3p25-p26

Kenneth D. Gibbs, Jr.,¹ Joan E. Bailey-Wilson,² Johanna Schleutker,³ Agnes B. Baffoe-Bonnie,^{2,4} Elizabeth Gillanders⁵

¹ Department of Chemistry and Biochemistry, University of Maryland, Baltimore County (UMBC), 1000 Hilltop Circle, Baltimore, MD 21250

² Statistical Genetics Section, National Human Genome Research Institute, National Institutes of Health, Baltimore, MD 21224

³ Laboratory of Cancer Genetics, University of Tampere and Tampere University Hospital, Tampere, Finland

⁴ Division of Population Science, Fox Chase Cancer Center, Philadelphia, PA 19111

⁵ Cancer Genetics Branch, National Human Genome Research Institute, National Institutes of Health, Bethesda, MD 20892, USA

2nd Place DEVELOPMENT OF BIOINFORMATICS TOOLS FOR ANALYSIS OF CONSERVED REGULATORY SEQUENCES IN MAMMALIAN PRE-MRNAS

Rumen Kostadinov, Garrett Dancik, *Robert Shine, Lawrence D'Antonio and Paramjeet S. Bagga (mentors)*

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

(F) Biological Sciences 2

1st Place ROSIGLITAZONE, A PPAR- γ AGONIST INHIBITS CONTRACTILE ACTIVITY IN MOUSE AORTIC RINGS

Danielle L. Daniely¹, *R. Clinton Webb PhD.*², *Mrs. Linda James*¹

¹Biology, Paine College, Augusta, GA 30901

²Physiology, Medical College of Georgia, Augusta, GA 30912

2nd Place EFFECT OF AGE ON EARLY STAGES OF COLON CANCER DEVELOPMENT IN FEMALE RATS

Kathleen Daly, *Dr. Bernadene Magnuson*

Biology Departmental Honors Program/ Department of Nutrition and Food Sciences, University of Maryland, 3301 Marie Mount Hall College Park, MD 20742

(G) Biological Sciences 3

1st Place FLUORESCENCE DETECTION OF SOLID-PHASE PCR ON MICROSPHERES

Melissa Martinez,¹ *Mary Lowe*²

¹Physics Department, College of Notre Dame of Maryland

²Physics Department, Loyola College in Maryland

2nd Place DETECTION OF ANTIBIOTIC RESISTANCE INTEGRONS IN SHENANDOAH VALLEY STREAM *ESCHERICHA COLI*

Nhu-Oanh Pham, *Dr. James Herrick*

Department of Biology, James Madison University

800 S. Main St., Harrisonburg, VA 22807

(H) Biological Sciences 4

1st Place NEUROADAPTATIONS IN THE VENTRAL TEGMENTAL AREA MEDIATES WITHDRAWAL-LIKE ELEVATIONS IN BRAIN REWARD THRESHOLDS IN NICOTINE DEPENDENT RATS

Armina Wiggins, *Dr. Athina Markou*

Department of Neuropsychopharmacology, Scripps Research Institute,
10550 North Torrey Pines Road, La Jolla, CA 92037

2nd Place SPECT IMAGING OF PAIN NEUROPHYSIOLOGY IN PATIENTS RECEIVING *IV KETOROLAC* VS. PLACEBO FOLLOWING THIRD MOLAR EXTRACTION

Randel L. Swanson II¹, *Andrew Newberg*², *John Farrar*³

¹Shepherd College, School of Natural Sciences and Mathematics,
Shepherdstown, WV 25443

²Hospital of the University of Pennsylvania, Division of Nuclear
Medicine, Philadelphia, PA 19104

³University of Pennsylvania School of Medicine, Center for Clinical
Epidemiology and Biostatistics, Philadelphia, PA 19104

(I) Biochemistry and Molecular Biology 1

1st Place INVESTIGATION OF DIFFERENTIAL METHYLATION AT *p57* IN MOUSE

Aly Dymkowski, Balpreet Bhogal, Alison Best, Anna Arnaudo and
Tamara L. Davis

Department of Biology, Bryn Mawr College, Bryn Mawr PA 19010

2nd Place DETECTION OF CYP2D6 mRNA IN THE CNS OF “HUMANIZED”
CYP2D6^{+/+} TRANSGENIC MICE

Bernie Boswell,¹ *Robert Haining*²

¹Chemistry Dept., Shepherd College, WV-BRIN*, Shepherdstown, WV.

²Dept. of Basic Pharmaceutical Sciences West Virginia Univ.,
Morgantown, WV

(J) Biochemistry and Molecular Biology 2

1st Place EFFECTS OF NEGATIVELY CHARGED LIPIDS ON NADPH OXIDASE
ACTIVITY IN A CELL-FREE SYSTEM LACKING ARACHIDONIC ACID

Taiese Bingham,¹ Mellonie Boyd,² Guihong Peng,² *Michael Kleinberg*,²

¹Department of Natural Sciences, University of Maryland Eastern Shore,
Princess Anne, Maryland; ²Research Service, VA Maryland Health Care
System, Baltimore, Maryland

2nd Place GC/MS MEASUREMENTS OF 1-ALKANOLS IN FISH BLOOD:
ANESTHETIC EFFECT AND BLOOD CONCENTRATION AS A FUNCTION
OF TIME OF APPLICATION.

Sara Kessler, Brendan Kelly, and *Eric Williamsen*

Department of Chemistry, Ursinus College, 601 E. Main Street,
Collegeville, PA 19426-1000

(K) Biochemistry and Molecular Biology 3

1st Place MOLECULAR EVOLUTION OF THE SEX DETERMINATION GENE FEM-3

Amanda Ackerman, *Dr. Eric Haag*

Department of Biology, University of Maryland, College Park, MD 20742

2nd Place NICOTINE EXPOSURE OF LL-24 CELLS AND THE MAPK PATHWAY

Katie Kielek¹ and *Diane Carlisle*²

¹Carlow College, 3333 Fifth Avenue, Pittsburgh, PA 15213

²Hillman Cancer Institute, Lab 2.7, 5117 Centre Avenue, Pittsburgh, PA
15213

(L) Biochemistry and Molecular Biology 4

1st Place AN ELECTROSTATIC MECHANISM FOR BCL-X_L INTERACTION WITH MEMBRANE

Jeffrey W. Craig,¹ Guru R. Thuduppathy,² and R. Blake Hill²
Departments of Biophysics¹ and Biology,² Johns Hopkins University,
Baltimore, MD

2nd Place THE ALTERED INTRACELLULAR CA²⁺ DYNAMICS IN CELLS OVEREXPRESSING MUTATED FORMS OF POLYCYSTIN 2

Reiesha Robbins,¹ Dr. Dayne Okuhara², *Dr. Stefen Somlo*²
¹Department of Natural Sciences, University of Maryland Eastern Shore,
²Department of Nephrology, Yale University School of Medicine

(M) Biochemistry and Molecular Biology 5

1st Place DPI INHIBITION IN METHANOTROPHIC BACTERIA

Aaron E. Lee,¹ Andrew K. Shiemke²
¹Shepherd College; ²West Virginia University School of Medicine,
Department of Biochemistry and Molecular Pharmacology;^{1,2}The West
Virginia Biomedical Research Infrastructure Network

2nd Place MELANOPSIN: STRUCTURE AND FUNCTION IN CIRCADIAN RHYTHMS

Alexis Oetting,¹ Marquis Walker,² *Dr. Phyllis Robinson*²
¹Department of Biology, Susquehanna University, 514 University Ave.,
Selinsgrove PA 17870; ²Department of Biology, UMBC, 1000 Hilltop
Circle, Baltimore MD 21250