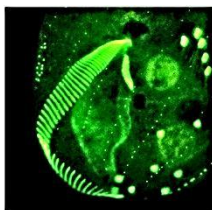
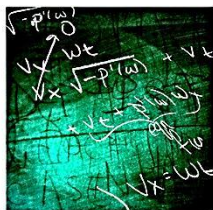
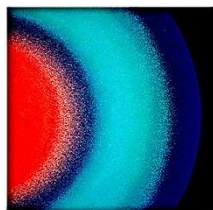


**UMBC**  
AN HONORS  
UNIVERSITY  
IN MARYLAND



**18<sup>th</sup> Annual Undergraduate Research Symposium  
in the  
Chemical and Biological Sciences**

*The College of Natural and Mathematical Sciences;  
The Department of Chemistry and Biochemistry &  
The Department of Biological Sciences*

**UMBC**  
AN HONORS UNIVERSITY IN MARYLAND

**Sponsored by:**

**National Institute of General Medical  
Sciences of the National Institutes of Health  
(NIGMS/NIH)**

Winners' List

# Morning Poster Session

## Group A – Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**      **UTILIZING STRUCTURAL AND ELECTRONIC ANALYSIS TO PREDICT THE EFFECTS  
(EFFECTIVENESS) OF PSEUDOPHOSPHORYLATION**

Kelly Daniels, Himel Ganguly, Anil Pandey, and Neal Zondlo  
Department of Chemistry and Biochemistry, University of Delaware, 210 South College Avenue,  
Newark, DE 19711

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**2<sup>nd</sup>  
Place**      **COMPUTATIONAL ANALYSIS OF THE MECHANISM OF THE UBIQUITIN CONJUGATING  
ENZYME UBC13**

Walker Jones, Aaron Davis, Serban Zamfir and Isaiah Sumner  
Department of Chemistry and Biochemistry, James Madison University, 800 South Main Street,  
Harrisonburg, VA 22807

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## Group B - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**      **CREATION AND CHARACTERIZATION OF RUBRERYTHRIN AND SYMERYTHRIN  
MODEL PROTEINS**

Jenna Pellegrino<sup>1</sup>, Katherine Bell<sup>1</sup>, Rachel Z. Polinski<sup>1</sup>, Sabrina N. Cimerol<sup>1</sup>, Ari Jacobos<sup>2</sup>,  
Edward I. Solomon<sup>2</sup>, and Amanda J. Reig<sup>1</sup>  
<sup>1</sup>Department of Chemistry, Ursinus College, 601 E. Main Street, Collegetown, PA 19426  
<sup>2</sup>Department of Chemistry, Stanford University, Stanford, CA

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**2<sup>nd</sup>  
Place**      **DETERMINING THE ROLES OF LSM PROTEINS IN *C. ELEGANS* SEX MUSCLE FATE  
SPECIFICATION**

Neta Shwartz<sup>1</sup>, Stephen Sammons<sup>2</sup> and Jun Kelly Liu<sup>2</sup>  
<sup>1</sup>Department of Biological Sciences, Towson University, Baltimore, MD 21252  
<sup>2</sup>Department of Molecular Biology and Genetics, Cornell University, Ithaca, NY 14853

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## Group C - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**      **TOWARDS SOLVING HIGH RESOLUTION STRUCTURE OF TITIN ZIG9/10**

Allyn Letourneau and Nathan Wright  
Department of Chemistry and Biochemistry, James Madison University, 800 South Main Street,  
Harrisonburg, VA 22807

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**2<sup>nd</sup>  
Place**      **ALTERED PYRUVATE KINASE MRNA EXPRESSION AND ABNORMAL METABOLIC  
PROFILES IN MELANOMA CELLS EXPRESSING THE WARBURG EFFECT**

Jonathan McKinney<sup>1,2</sup>, Teofilo Borunda<sup>1</sup>, and Todd Thompson<sup>1</sup>  
<sup>1</sup>Department of Pharmacology, University of New Mexico, Albuquerque, NM 87131  
<sup>2</sup>Department of Chemistry, McDaniel College, 2 College Hill, Westminster, MD 21157

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Winners' List

## Group D - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**      **BIOCHEMICAL CHARACTERIZATION OF THE INTERACTION BETWEEN AN INNATE IMMUNE RECEPTOR NOD2 AND ITS CHAPERONES**

Hannah C. Wastyk<sup>1</sup>, Catherine L. Grimes<sup>1,2</sup>, Amy Schaefer<sup>1</sup>, Ching-Wen Hou<sup>1</sup>,  
Mackenzie Lauro<sup>1</sup>, and Vishnu Mohanan<sup>2</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, University of Delaware,  
102 Brown Laboratory, Newark, DE 19716,

<sup>2</sup>Department of Biological Sciences, University of Delaware, 118 Wolf Hall, Newark, DE 19716

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**2<sup>nd</sup>  
Place**      **UNDERSTANDING PROTEIN-PROTEIN INTERACTIONS OF ACYL CARRIER PROTEINS USING AN INFRARED ACTIVE THIOCYANATE PROBE**

Kathleen Tsai, Grace Thiele, Casey Londergan and Louise Charkoudian  
Department of Chemistry, Haverford College, 370 Lancaster Avenue, Haverford, PA 19041

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## Group E - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**      **PROTEOMIC ANALYSIS OF YEAST HISTONE METHYLTRANSFERASE SETS**

Rashi Turniansky<sup>1</sup>, James Moresco<sup>2</sup>, John Yates<sup>2</sup>, and Erin Green<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD, 21250

<sup>2</sup> Scripps Research Institute, 10550 N Torrey Pines Road, La Jolla, CA, 92037

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**2<sup>nd</sup>  
Place**      **ALTERATION OF PSEUDOMONAS PUTIDA  $\beta$ -HBDH COFACTOR SPECIFICITY**

Jorna Sojati, Connor Ott, Nadia Galchak, and Jennifer B. Palenchar.  
Department of Chemistry, Program in Biochemistry, Villanova University,  
800 E. Lancaster Avenue, Villanova, PA 19085

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## Group F – Biological Sciences

**1<sup>st</sup>  
Place**      **THE EPSILON SUBUNIT OF DNA POLYMERASE III IN THE BACTERIAL RESPONSE TO QUINOLONES**

Kelly DiGeronimo, Amanda Finck, and Zakiya Whatley  
Department of Biology, Gettysburg College, 300 N. Washington Street, Gettysburg, PA 17325

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**2<sup>nd</sup>  
Place**      **DEVELOPMENT AND INVESTIGATION OF A NEW FLUOROGEN ACTIVATING PROTEIN, J3, FOR THE PRODUCTION OF A PROTEASE BIOSENSOR IN A NEW COLOR**

Vivian Pham, Matthew J. Farber and Peter B. Berget  
Department of Biological Sciences, University of the Sciences,  
600 S. 43<sup>rd</sup> Street, Philadelphia, PA 19104

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Winners' List

## Group G – Biological Sciences

**1<sup>st</sup> Place**                    **BIODISTRIBUTION STUDIES OF NEAR-INFRARED LABELED NANOEMULSIONS IN A RAT CCI PAIN MODEL**

Ryan Sanders<sup>1,2</sup>, Emily Nehl<sup>1,2</sup>, Muzamil Saleem<sup>1,2</sup>, Andrea Stevens<sup>1,2</sup>,  
Jelena Janjic<sup>2,3</sup>, and John Pollock<sup>1,2</sup>

<sup>1</sup>Department of Biological Sciences, Duquesne University, Pittsburgh, PA 15203

<sup>2</sup>Chronic Pain Research Consortium, Duquesne University, Pittsburgh, PA 15203

<sup>3</sup>Mylan School of Pharmacy Duquesne University, Pittsburgh, PA 15203

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**2<sup>nd</sup> Place**                    **CHARACTERIZATION OF NANOPARTICLES USING ATOMIC FORCE MICROSCOPY (AFM)**

Chloe A. Kwon, Margaret E. LaCourse, Ian W. Shaffer,  
Joshua A. Wilhide, and William R. LaCourse  
Molecular Characterization and Analysis Complex, UMBC,  
1000 Hilltop Circle, Baltimore MD 21250

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## Group H – Biological Sciences

**1<sup>st</sup> Place**                    **CHARACTERIZATION OF CANDIDATE MORBID MUTATIONS IDENTIFIED IN TWO PATIENTS WITH MYCOBACTERIAL OR SEVERE VIRAL DISEASES**

Austin Gabel<sup>1</sup>, Serkan Belkaya<sup>2</sup>, Jacinta Bustamante<sup>2</sup>, Emmanuelle Jouanguy<sup>2</sup>,  
Stéphanie Boisson-Dupuis<sup>2</sup>, and Jean-Laurent Casanova<sup>2</sup>

<sup>1</sup> Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>St. Giles Laboratory of Human Genetics and Infectious Diseases,  
The Rockefeller University, New York, NY

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**2<sup>nd</sup> Place**                    **RNA INTERFERENCE OF DEVELOPMENTAL GENES IN THE PEA APHID EMBRYO**

Maritza Vazquez-Trejo, Erin Bonner, and Gregory Davis  
Department of Biology, Bryn Mawr College, 101 N. Merion Avenue, Bryn Mawr, PA 19010

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## Group I – Biological Sciences

**1<sup>st</sup> Place**                    **MAP1B IMPACTS ON NEURULATION AND MICROTUBULE STABILITY**

Eudorah Vital, Jonathan Werner, Pradeepa Jayachandran\*, Valerie Olmo\*, Stephanie Sanchez\*, Elim Hong,  
Rebecca McFarland, Neus Sanchez- Alberola, and Rachel Brewster  
Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 212150

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**2<sup>nd</sup> Place**                    **microRNA MODULATION OF THE NON-CANONICAL WNT SIGNALING PATHWAY IS ESSENTIAL FOR CELLULAR MORPHOGENESIS**

Tyler McCann and Jia Song  
Department of Biological Sciences, University of Delaware, 105 The Green, Newark, DE 19716

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Winners' List

## Group J – Biological Sciences

**1<sup>st</sup>  
Place**                    **ANTIMICROBIAL PROPERTIES OF FLUOROQUINOLONE ANTIBIOTICS ON RESISTANT  
AND NON-RESISTANT BACTERIA IN BALTIMORE WASTEWATER AND SURFACE  
WATER**

Hollie Adejumo, Ke He, and Lee Blaney  
Department of Chemical, Biochemical and Environmental Engineering, UMBC,  
1000 Hilltop Circle, Baltimore, MD 21250

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**2<sup>nd</sup>  
Place**                    **NOVEL MARKERS OF LENS FIBROSIS**

Priyha Mahesh, Yichen Wang, and Melinda K. Duncan  
Department of Biological Sciences, University of Delaware,  
Wolf Hall, The Green, Newark, DE 19716

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## Group K – Biological Sciences

**1<sup>st</sup>  
Place**                    **CHARACTERIZATION OF EPIGENETIC PATTERNS IN THE HUMAN RETINA**

Nicholas Dunham, Annamarie Meinsen, Morgan Hedden, and Raymond Enke  
Department of Biology, James Madison University,  
800 South Main Street, Harrisonburg, VA 22807

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**2<sup>nd</sup>  
Place**                    **GOLDENSEAL (*HYDRASTIS CANADENSIS* L.) EXTRACT DOSE-DEPENDENT  
GROWTH INHIBITION OF *H. PYLORI* BACTERIA AND EFFECTS OF *H. PYLORI* ON  
GASTRIC CELL FREE AMINO ACID CONCENTRATIONS**

Nimasha Fernando<sup>1</sup>, Aime T. Franco<sup>2</sup>, and Howard P. Hendrickson<sup>3</sup>  
<sup>1</sup>Department of Interdisciplinary Studies, UMBC, 1000 Hilltop Circle, Baltimore, MD 21921  
<sup>2</sup>Department of Physiology and Biophysics, College of Medicine,  
University of Arkansas for Medical Sciences, 4301 West Markham Street, Little Rock, AR 72205  
<sup>3</sup>Department of Pharmaceutical Sciences, College of Pharmacy,  
University of Arkansas for Medical Sciences, 4301 West Markham Street, Little Rock, AR 72205

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## Group L – Biological Sciences

**1<sup>st</sup>  
Place**                    **INVESTIGATION INTO THE ROLE OF RALDH2 IN INFLAMMATION AND  
REMYELINATION IN THE CNS**

Alisha N. Dua, Sonia Nanescu, and Jeffrey K. Huang  
Department of Biology, Georgetown University, 37<sup>th</sup> and O Street NW, Washington, DC 20057

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**2<sup>nd</sup>  
Place**                    **EFFECT OF HYDROGEL MODULUS ON MACROPHAGE PHENOTYPE**

Nile J. Bunce,<sup>1</sup> Rebecca A. Scott,<sup>1,2</sup> Robert E. Akins,<sup>2</sup> and Kristi L. Kiick<sup>1</sup>  
<sup>1</sup>Department of Materials Science & Engineering, University of Delaware, 201 Dupont Hall,  
Newark, DE 19711  
<sup>2</sup>Nemours Biomedical Research, A.I. duPont Hospital for Children, 1600 Rockland Road,  
Wilmington, DE 19803

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Winners' List

## Group M – Biological Sciences

**1<sup>st</sup>  
Place**                    **MOLECULAR CHARACTERIZATION OF TWO HUMAN LENS EPITHELIAL CELL LINES  
AND THEIR SUITABILITY TO STUDY FUNCTION OF CATARACT GENES**

Joshua Barton, Archana Siddam, Deepti Anand, and Salil A. Lachke  
Department of Biological Sciences, University of Delaware, 105 The Green, Delaware Avenue, Newark,  
DE 19716

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**2<sup>nd</sup>  
Place**                    **ROLE OF ECDYSONE IN THE MIGRATION OF BORDER CELLS IN *DROSOPHILA*  
*MELANOGASTER* EGG CHAMBERS**

Kamsi Odinammadu, Neus Sanchez Alberola, Jinal Sheth, and Michelle Starz-Gaiano  
Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

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## Group N – Biological Sciences

**1<sup>st</sup>  
Place**                    **BEHAVIORAL COMPARISON OF OLFACTION RECOVERY IN WILD TYPE AND SKN-1A  
KNOCKOUT MICE AFTER IRRITANT EXPOSURE**

Julianna Sun<sup>1</sup>, Kayla Lemons<sup>1</sup>, Mario Rodriguez<sup>2</sup>, David Dunston<sup>1</sup>, and Weihong Lin<sup>1</sup>  
<sup>1</sup>Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250  
<sup>2</sup>Department of Biology, University of Miami, Coral Gables, FL 33124

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**2<sup>nd</sup>  
Place**                    **MODULATION OF VALENCE-SPECIFIC LEARNING IN THE BASOLATERAL AMYGDALA  
BY NEUROTENSIN**

Kritika Chugh<sup>1</sup>, Praneeth Namburi<sup>2</sup>, and Kay Tye<sup>2</sup>  
<sup>1</sup>Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250  
<sup>2</sup>Picower Institute for Learning and Memory, MIT,  
77 Massachusetts Avenue, Cambridge, MA 02139

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## Group O – Chemical Sciences

**1<sup>st</sup>  
Place**                    **OUTER PRODUCT ANALYSIS (OPA) FOR CALIBRATION TRANSFER**

Cannon Giglio and Steven D. Brown  
Department of Chemistry and Biochemistry, University of Delaware,  
163 The Green, Newark, DE 19716

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**2<sup>nd</sup>  
Place**                    **OPTIMIZATION OF NATURAL PRODUCT EXTRACTION FOR INCORPORATION INTO AN  
UPPER-LEVEL UNDERGRADUATE ORGANIC SYNTHESIS LABORATORY: EFFICIENT  
ISOLATION AND DERIVATIZATION OF SHIKIMIC ACID**

Gina G. To and Steven M. Kennedy  
Department of Chemistry, Millersville University, 1 S. George Street, Millersville, PA 17551

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Winners' List

## Group P – Chemical Sciences

**1<sup>st</sup> Place** **TOTAL SYNTHESIS OF PYROPHEN**

Hannah Burdge and Keith Reber  
Department of Chemistry, Towson University, 8000 York Road, Towson, MD 21703

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**2<sup>nd</sup> Place** **CO(II)-SALEN CATALYZED CARBON-CARBON BOND FORMATION VIA C–H FUNCTIONALIZATION FOR THE ELABORATION OF HETEROCYCLES**

Andrew De Los Santos<sup>1</sup>, Andrew Schafer<sup>2</sup>, and Simon Blakey<sup>2</sup>  
<sup>1</sup>Department of Chemistry, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250  
<sup>2</sup>Department of Chemistry, Emory University, 1515 Dickey Drive, Atlanta, GA 30322

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## Group Q – Chemical Sciences

**1<sup>st</sup> Place** **COCRYSTALLIZATION OF N,N'-DIPHENYLUREAS AND TRIPHENYLPHOSPHINE OXIDE BASED ON HETERODIMER ENERGIES**

Taylor A. Watts<sup>1</sup>, Marina A. Solomos<sup>2</sup>, and Jennifer A. Swift<sup>2</sup>  
<sup>1</sup>Department of Chemistry, Towson University, 8000 York Road, Towson, MD 21252  
<sup>2</sup>Department of Chemistry, Georgetown University, 3700 O Street NW, Washington, DC 20057

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**2<sup>nd</sup> Place** **MICROWAVE ASSISTED ORGANIC SYNTHESIS OF HEPTAMETHINE CYANINE DYES**

Jahnn Drigo and Angela Winstead  
Department of Chemistry, Morgan State University, 1700 E. Cold Spring Lane,  
Baltimore, MD 21251

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## Group R – Chemical Sciences

**1<sup>st</sup> Place** **THE EFFECT OF HOFMEISTER SERIES COUNTERIONS ON THE COLLOIDAL AND ANTIMICROBIAL PROPERTIES OF A TRIPLE-HEADED SINGLE-TAILED AMPHIPHILE**

Kirstie Thompson<sup>1</sup>, Elizabeth Rogers<sup>2</sup>, Kyle Seifert<sup>2</sup> and Kevin Caran<sup>1</sup>  
<sup>1</sup>Department of Chemistry and Biochemistry, James Madison University, 901 Carrier Drive, MSC 4501, Harrisonburg, VA 22807  
<sup>2</sup>Department of Biology, James Madison University, 951 Carrier Drive, MSC 7801, Harrisonburg, VA 22807

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**2<sup>nd</sup> Place** **EFFECTIVENESS OF NON-WOVEN GEOTEXTILE FABRIC IN SLOW SAND FILTRATION**

Justin Thaggard<sup>1</sup> and James N. Jensen<sup>2</sup>  
<sup>1</sup> Department of Chemical Engineering, UMBC, 1000 Hilltop Circle, Baltimore, MD, 21250  
<sup>2</sup>Department of Civil, Structural, and Environmental Engineering, State University of New York at Buffalo, Buffalo, NY 14260

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Winners' List

## Group S – Chemical Sciences

**1<sup>st</sup> Place**      **SYNTHESIS AND STUDY OF POLYCATIONIC AMPHIPHILES AS POTENT ANTISEPTICS AND NOVEL COLLOIDS: EXPLORING STRUCTURE ACTIVITY RELATIONSHIPS**

Brenna J. C. Walsh<sup>1</sup>, Kunny Kou<sup>2</sup>, John N. Marafino<sup>1,2</sup>, Kristin McKenna<sup>1</sup>, Kirstie Thompson<sup>1</sup>, Tara M. Gallagher<sup>2</sup>, Kyle Seifert<sup>2</sup>, and Kevin L. Caran<sup>1</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, James Madison University,  
901 Carrier Drive, MSC 4501, Harrisonburg, VA 22807

<sup>2</sup>Department of Biology, James Madison University, 820 Madison Drive, MSC 7801,  
Harrisonburg, VA 22807

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**2<sup>nd</sup> Place**      **MARCELLUS SHALE GAS DRILLING AND TIOGA COUNTY WATER QUALITY**

Martin Holdren<sup>1</sup>, Emily Edwards<sup>1</sup>, Megan Terrel<sup>1</sup>, Joseph Mandeville<sup>1</sup>, Shaker Ramasamy<sup>1</sup>, Michele Conrad<sup>1</sup>, and Paul Wendel<sup>2</sup>

<sup>1</sup>Department of Chemistry and Physics, Mansfield University, Mansfield, PA 16933

<sup>2</sup>Department of Education, Otterbein University, Westerville, OH 43081

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## Group T – Chemical Sciences

**1<sup>st</sup> Place**      **UNDERSTANDING A FUNDAMENTAL FORCE IN PROTEIN FOLDING: TUNING THE  $n \rightarrow \pi^*$  INTERACTION VIA DESIGNED PEPTIDES**

Nicole Wenzell, Himal Ganguly, Glenn Yap and Neal Zondlo

Department of Chemistry and Biochemistry, University of Delaware, 339 Brown Laboratory,  
Newark, DE 19716

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**2<sup>nd</sup> Place**      **MULTIMERIZATION OF SOLUTION-STATE PROTEINS BY WATER SOLUBLE PORPHYRINS**

Daniel Marzolf, Aidan McKenzie, Alex Hudson, and Oleksandr Kokhan

Department of Chemistry, James Madison University, 800 S. Main Street, Harrisonburg, VA 22807

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## Group U – Chemical Sciences

**1<sup>st</sup> Place**      **SYNTHESIS AND CHARACTERIZATION OF PALLADIUM NANOPARTICLE DOPED 3D GRAPHENE NANOSHEETS FOR USE AS ELECTROCATALYST SUPPORTS IN FUEL CELLS**

Sean Najmi<sup>1</sup>, Sadia Kabir<sup>2</sup>, Alexey Serov<sup>2</sup>, and Plamen Atanassov<sup>2</sup>

<sup>1</sup>Department of Chemical, Biochemical, and Environmental Engineering, UMBC,  
1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Department of Chemical and Biological Engineering, University of New Mexico,  
Albuquerque, NM 87131

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**2<sup>nd</sup> Place**      **TEMPLATE-DIRECTED CRYSTALLIZATION OF DIPHENYL UREA**

Serena Seshadri, Marina Solomos, and Jennifer Swift

Department of Chemistry, Georgetown University, 3700 O Street NW, Washington DC 20057

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Winners' List

**Group V – Chemical Sciences**

**1<sup>st</sup>  
Place**                    **ULTRAFAST LIMITS OF PHOTO-INDUCED ELECTRON TRANSFER RATES IN PpcA, A  
MULTI-HEME C-TYPE CYTOCHROME**

Aidan M. McKenzie, Daniel R. Marzolf, Matthew C. O'Malley, and Oleksandr Kokhan  
Department of Chemistry and Biochemistry, James Madison University,  
800 S. Main Street, Harrisonburg, VA 22807

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**2<sup>nd</sup>  
Place**                    **THE SYNTHESIS OF COBALT TETRAPYRROLE MACROCYCLES AND ACTIVITY FOR  
DIOXYGEN REDUCTION TO WATER OR HYDROGEN PEROXIDE**

Taylor Paskey, Jennifer Eddy, and Joel Rosenthal  
Department of Chemistry and Biochemistry, University of Delaware, Newark, DE 19716

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# Afternoon Poster Session

## Group W – Biochemical & Molecular Biology

1<sup>st</sup>  
Place

**PHYSICAL INTERACTION OF T-CADHERIN AND ADIPONECTIN  
CONFIRMS THE NOVEL ROLE OF T-CADHERIN AS A RECEPTOR**

Triet Bui<sup>1</sup>, Roberta Pascolutti<sup>2</sup>, and Andrew Kruse<sup>2</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, McDaniel College, Westminster, MD 21157

<sup>2</sup>Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School,  
Boston, MA 02115

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2<sup>nd</sup>  
Place

**IDENTIFYING RESIDUES ON DNAK WHICH ARE IMPORTANT FOR CO-CHAPERONE  
COLLABORATION**

Skylar Dewees<sup>1</sup>, Andrea Kravats<sup>2</sup>, Shannon Doyle<sup>2</sup>, and Sue Wickner<sup>2</sup>

<sup>1</sup>Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Laboratory of Molecular Biology, National Cancer Institute, National Institutes of Health,  
37 Convent Drive, Bethesda, MD 20892

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## Group X - Biochemical & Molecular Biology

1<sup>st</sup>  
Place

**CHARACTERIZING THE EFFECTS OF PHOSPHORYLATION ON THE STRUCTURAL  
DYNAMICS OF UBIQUITIN**

Yaniv Kazansky and Fushman David

Department of Chemistry and Biochemistry, University of Maryland, College Park, MD 20742

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2<sup>nd</sup>  
Place

**STABILIZATION OF THE HIV-1 RNA GENOME 5'-UNTRANSLATED REGION (5'-UTR)  
MONOMER CONFORMER IN SODIUM ACETATE BUFFER**

Seung Ho Choi, Hannah Carter, Aishwarya Iyer, Joshua Brown, and Michael F. Summers

Howard Hughes Medical Institute, Department of Chemistry and Biochemistry, UMBC,  
1000 Hilltop Circle, Baltimore MD 21250

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Winners' List

## Group Y - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**                    **MECHANISM OF ACTION OF SCHWEINFURTHINS, A NEW CLASS OF ANTICANCER  
COMPOUNDS**

Shaun Egolf<sup>1</sup>, Nancy Lill<sup>2,3</sup>, Jeffrey Neighbors<sup>2,3</sup>, and Raymond Hohl<sup>2,3</sup>

<sup>1</sup>Department of Biological Sciences, Messiah College,  
One College Avenue, Mechanicsburg, PA 17055

<sup>2</sup>Department of Pharmacology, Penn State College of Medicine, 500 University Drive, Hershey, PA 17033

<sup>3</sup>Penn State Hershey Cancer Institute, Penn State College of Medicine,  
500 University Drive, Hershey, PA 17033

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**2<sup>nd</sup>  
Place**                    **ADIPOCYTE mTORC2 KNOCKOUT DISRUPTS WHOLE-BODY GLUCOSE AND LIPID  
METABOLISM AND IMPAIRS THE BEIGEING OF WHITE ADIPOSE**

Laura Ritenour<sup>1,2,3</sup>, Cassie Tran<sup>2,3</sup>, Joseph Baur<sup>2,3</sup>

<sup>1</sup>Department of Biological Sciences, Messiah College, One College Avenue,  
Mechanicsburg, PA 17055

<sup>2</sup>Department of Physiology, Perelman School of Medicine, University of Pennsylvania,  
3400 Civic Center Boulevard, Philadelphia, PA 19104

<sup>3</sup>Institute for Diabetes, Obesity, and Metabolism, Perelman School of Medicine,  
University of Pennsylvania, 3400 Civic Center Boulevard, Philadelphia, PA 19104

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## Group Z - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**                    **TEMPORAL DYNAMICS OF CASPASE ACTIVITY IN JURKAT CELLS**

Sean Morris and Randall Reif

Department of Chemistry, University of Mary Washington, 1301 College Avenue,  
Fredericksburg, VA 22401

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**2<sup>nd</sup>  
Place**                    **THE CHARACTERIZATION OF AN ESSENTIAL PROTEIN SPECIFIC TO TRYPANOSOME  
PARASITES**

William G. Escobar-Arrillaga and Jennifer B Palenchar

Department of Chemistry, Program in Biochemistry, Villanova University,  
800 E. Lancaster Avenue, Villanova, PA 19085

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Winners' List

## Group AA - Biochemical & Molecular Biology

**1<sup>st</sup>  
Place**                    **PEGLYATED BIODEGRADABLE BRAIN PENETRATING PARTICLES FOR WIDESPREAD  
GENE DELIVERY**

Young Eun Kim<sup>1</sup>, Panagiotis Mastorakos<sup>2,4</sup>, Eric Song<sup>3</sup>, Clark Zhang<sup>2,5</sup>, Sneha Berry<sup>2,3</sup>, Hee Won Park<sup>1</sup>,  
Jong Sung Park<sup>2,6</sup>, Seulki Lee<sup>2,6</sup>, Jung Soo Suk<sup>2,4,5</sup>, and Justin Hanes<sup>1,2,4,5</sup>

<sup>1</sup>Department of Chemical and Biomolecular Engineering, Johns Hopkins University,  
3400 N. Charles Street, Baltimore, MD 21218

<sup>2</sup>Center for Nanomedicine, Wilmer Eye Institute, Johns Hopkins University School of Medicine,  
400 N. Broadway, Baltimore, MD 21231

<sup>3</sup>Center for Biotechnology Education, Krieger School of Arts and Sciences, 3400 N. Charles Street,  
Baltimore, MD 21218

<sup>4</sup>Department of Ophthalmology, The Wilmer Eye Institute,  
Johns Hopkins University School of Medicine, 600 N Wolfe Street, Baltimore, MD 21297

<sup>5</sup>Department of Biomedical Engineering, Johns Hopkins University School of Medicine,  
720 Rutland Avenue, Baltimore, MD 21205

<sup>6</sup>Russell H. Morgan Department of Radiology and Radiological Science,  
Johns Hopkins University, 601 N. Caroline Street, Baltimore, MD 21287

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**2<sup>nd</sup>  
Place**                    **COMPARISON OF STABILITY AND KINETIC PROPERTIES OF DSZB FROM *N.*  
*ASTEROIDES* A3H1 AND *R. ERYTHROPOLIS* IGTS8**

Alanna Hutchinson-Lundy, Austin Crithary, Jonathan Schmitz, and Linette Watkins  
Department of Chemistry and Biochemistry, James Madison University, 800 S. Main Street, Harrisonburg,  
VA 22807

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## Group BB – Biological Sciences

**1<sup>st</sup>  
Place**                    **IMPACT OF ANTIBIOTICS ON HORIZONTAL GENE TRANSFER IN *VIBRIO CHOLERAE***

Swathi Penumutthu<sup>1,2</sup>, Peter Belenky<sup>2</sup>, and Benjamin Korry<sup>2</sup>

<sup>1</sup>UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Department of Molecular Microbiology and Immunology, Brown University, 171 Meeting Street,  
Providence, RI 02912

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**2<sup>nd</sup>  
Place**                    ***PSEUDOMONAS* SP. REVEAL MAGNETOTACTIC BEHAVIOR ISOLATED  
FROM POND SEDIMENTS**

Usman Ahmad and Om V. Singh

Division of Biological and Health Sciences, University of Pittsburgh at Bradford,  
Bradford, PA 16701

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Winners' List

## Group CC – Biological Sciences

**1<sup>st</sup>  
Place**            **A GENETIC SCREEN FOR BLOOD-INDUCED PROMOTERS FROM *ASAIA BOGORENSIS*, A  
MIDGUT SYMBIONT OF MALARIA VECTOR MOSQUITOES**

Lianna Paul<sup>1</sup>, Jackie Shane<sup>1</sup>, Nicholas Bongio<sup>1,2</sup>, and David Lampe<sup>1</sup>

<sup>1</sup>Department of Biological Sciences, Duquesne University, 600 Forbes Avenue, Pittsburgh, PA 15282

<sup>2</sup>Department of Biology, Shenandoah University, 1460 University Drive, Winchester, VA 22601

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**2<sup>nd</sup>  
Place**            **ANALYSIS OF DNA METHYLATION AT THE C-REGION OF IMPRINTED *RASGRF1*  
ACROSS MOUSE DEVELOPMENT**

Kristian Sumner and Tamara L. Davis

Department of Biology, Bryn Mawr College, Bryn Mawr, PA 19010-2899

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## Group DD – Biological Sciences

**1<sup>st</sup>  
Place**            **THE ROLE OF N-LINKED GLYCOSYLATION IN DROSOPHILA DEVELOPMENT**

Morgan Thomas and Erica M. Selva

Department of Biological Sciences, University of Delaware, 210 South College Avenue,  
Newark, Delaware 19711

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**2<sup>nd</sup>  
Place**            **NITROGEN AND PHOSPHORUS EXCRETION BY NATIVE FRESHWATER MUSSELS AND  
INVASIVE CHINESE MYSTERY SNAILS IN NOVA SCOTIA**

Amberlin Hines<sup>1</sup>, Caroline M. Solomon<sup>1</sup>, and Linda M. Campbell<sup>2</sup>

<sup>1</sup>Department of Science, Technology, and Mathematics, Gallaudet University,  
800 Florida Avenue NE, Washington DC 20002

<sup>2</sup>Department of Environmental Science, Saint Mary's University, 923 Robie Street Halifax,  
Nova Scotia, Canada B3H-3C3

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## Group EE – Biological Sciences

**1<sup>st</sup>  
Place**            **VALIDATION OF AN EPITOPE-TAGGED HAND1 KNOCK-IN ALLELE**

Samantha Eng<sup>1</sup>, Beth Firulli<sup>2</sup>, and Anthony Firulli<sup>2</sup>

<sup>1</sup>Department of Biological Sciences, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Department of Pediatrics, Indiana University-Purdue University Indianapolis (IUPUI),  
702 Barnhill Drive, Indianapolis, IN 46202

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**2<sup>nd</sup>  
Place**            **SAY "BYE-O" TO FOSSIL FUELS AND HELLO TO BIOFUELS: EXPLORING THE  
PRODUCTION OF CELULOSIC ETHANOL IN THE INTERGRATED UNDERGRADUATE  
LABORATORY**

David Chiat, Anne Terrell, and Alenka Hlousek-Radojic

Department of Biology, University of Delaware, 210 South College Avenue,  
Newark, DE 19716

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Winners' List

## Group FF – Biological Sciences

**1<sup>st</sup>  
Place**      **SCORING SEQUENCE FOR MODELLED FOLDING CONFORMATION IN INTERACTIVE-ROSETTA USING HMMSTR**

Oluwadamilola Lawal<sup>1,2</sup>, Christian Schenkelberg<sup>2</sup>, Shounak Banerjee<sup>2</sup>,  
Benjamin Walcott<sup>2</sup>, and Christopher Bystruff<sup>2</sup>

<sup>1</sup>Department of Biology, Medgar Evers College, 1650 Bedford Avenue, Brooklyn, NY 11225

<sup>2</sup>Department of Biology, Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY 12180

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**2<sup>nd</sup>  
Place**      **RNA-SEQ ANALYSIS OF SEXUAL- AND ASEXUAL-FATED *ACYRTHOSIPHON PISUM* EMBRYOS**

Gemma Johnson, Emily Spica, Joshua Shapiro, and Gregory Davis

Department of Biology, Bryn Mawr College, 101 N. Merion Avenue, Bryn Mawr, PA 19010

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## Group GG – Biological Sciences

**1<sup>st</sup>  
Place**      **COPPER BIOREMEDIATION USING GENETICALLY ENGINEERED *ESCHERICHIA COLI***

Pranesh Navarathna<sup>1</sup>, May Li<sup>1</sup>, UMBC iGEM team<sup>2</sup>, Cynthia Wagner<sup>3</sup>, and Stephen Freeland<sup>4</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>3</sup>Department of Biology, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>4</sup>Department of Interdisciplinary Studies, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>*With contribution from the UMBC iGEM team; Sam Keating, Alex Kuznetsov, Natithorn Bhusri, Dennis Fasciani, John Jayman, Joseph Sparenberg, Mark Saint-John Kerr, Matthew Coveyoui, Mukta Bain, Pari Majethia, Paulinus Nwosu, Ryan O'Connell, Sumanth Neerumalla, Tarik Hawkins, Thomas Coard, Valerie Yu, William Angel*

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**2<sup>nd</sup>  
Place**      **ENDOCRINE CONTROL OF CARBOHYDRATE METABOLISM IN *XENOPUS TROPICALIS*; TISSUE SPECIFIC EXPRESSION AND REGULATION OF GLUT2**

Mara Bezerko, Brooke Merchant, Yang Ding, and George Delahunty

Department of Biology, Goucher College, 1021 Dulaney Valley Road, Towson, MD 21204

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Winners' List

## Group HH – Biological Sciences

**1<sup>st</sup>  
Place**                      **TARGETING MITOCHONDRIAL BIOGENESIS TO OVERCOME INTRINSIC AND  
ACQUIRED DRUG RESISTANCE TO MAPK PATHWAY INHIBITORS**

Omotayo Ope,<sup>1,6</sup> Gao Zhang,<sup>1</sup> Lawrence Wu,<sup>1</sup> Dennie T. Frederick,<sup>2</sup> Zhi Wei,<sup>3</sup> Young Chan Chae,<sup>1</sup>  
Xiaowei Xu,<sup>4</sup> Clemens Krepler,<sup>1</sup> Gordon B. Mills,<sup>5</sup> Dario C. Altieri,<sup>1</sup>  
Keith T. Flaherty,<sup>2</sup> and Meenhard Herlyn<sup>1</sup>

<sup>1</sup>Molecular and Cellular Oncogenesis Program, The Wistar Institute, Philadelphia, PA 19104

<sup>2</sup>Cancer Center, Massachusetts General Hospital Cancer Center, Boston, MA 02114

<sup>3</sup>Department of Computer Science, New Jersey Institute of Technology, Newark, NJ 07102

<sup>4</sup>Department of Pathology and Laboratory Medicine, Hospital of University of Pennsylvania,  
Philadelphia, PA 19104

<sup>5</sup>Department of Systems Biology, The University of Texas MD Anderson Cancer Center,  
Houston, TX 77030

<sup>6</sup>Department of Biology, Immaculata University, 1145 W King Road, Immaculata, PA 19345

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**2<sup>nd</sup>  
Place**                      **OBESITY AND YOUNG ONSET COLORECTAL CANCER: A REVIEW**

Hayley Richardson<sup>1</sup>, Bilel Gdoura<sup>2</sup>, Alfred I. Neugut<sup>3,4</sup>, and Christine L. Sardo Molmenti<sup>3,4</sup>

<sup>1</sup>Department of Mathematics and Statistics, UMBC, 1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Department of Biology, George Mason University, 4400 University Drive, Fairfax, VA 22030

<sup>3</sup>Department of Epidemiology, Columbia University Mailman School of Public Health,  
722 West 168th Street, New York, NY 10032

<sup>4</sup>Herbert Irving Comprehensive Cancer Center, 1130 St. Nicholas Avenue, New York, NY 10032

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## Group II – Biological Sciences

**1<sup>st</sup>  
Place**                      **BONE PAIN FROM METASTATIC PROSTATE CANCER MAY BE MEDIATED THROUGH  
PURINERGIC SIGNALING**

Michael Wilson<sup>1</sup>, Randall Duncan<sup>1,2</sup>, and Mary Boggs<sup>1</sup>

<sup>1</sup>Department of Biological Sciences, University of Delaware, Wolf Hall,  
105 The Green, Newark, DE, 19716

<sup>2</sup>Department of Biomedical Engineering, University of Delaware,  
150 Academy Street 161 Colburn Lab, Newark, DE 19716

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**2<sup>nd</sup>  
Place**                      **CHARACTERIZATION OF THE MUTATIONAL LANDSCAPE OF BREAST CANCER LUNG  
METASTASES BY NEXT GENERATION SEQUENCING**

Jack Sanford<sup>1,2</sup>, Karol Szczepanek<sup>1</sup>, Ngoc-Han Ha<sup>1</sup>, and Kent W. Hunter<sup>1</sup>

<sup>1</sup>Laboratory of Cancer Biology and Genetics, National Cancer Institute, Bethesda, MD 20892

<sup>2</sup>Jess and Mildred Fisher College of Science and Mathematics, Towson University,  
Towson, MD 21252

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Winners' List

## Group JJ – Biological Sciences

**1<sup>st</sup>  
Place**                    **FUNCTIONAL CHARACTERIZATION OF A NOVEL BTB/POZ DOMAIN ZINC FINGER  
TRANSCRIPTION FACTOR ZBTB8B IN MAMMALIAN LENS DEVELOPMENT**

Nathaniel Borders<sup>1</sup>, Soma Dash<sup>1</sup>, and Salil A. Lachke<sup>1,2</sup>

<sup>1</sup>Department of Biological Sciences, University of Delaware, Newark, DE 19716

<sup>2</sup>Center for Bioinformatics & Computational Biology, University of Delaware,  
Newark, DE 19716

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**2<sup>nd</sup>  
Place**                    **USING THE AMBORELLA TRICHOPODA EXPANSIN SUPERFAMILY TO ELUCIDATE THE  
HISTORY OF ANGIOSPERM EXPANSINS**

Victoria H. Seader<sup>1</sup>, Jennifer M. Thornsberry<sup>2</sup>, and Robert E. Carey<sup>2</sup>

<sup>1</sup>Program in Biochemistry and Molecular Biology, Lebanon Valley College,  
101 N. College Avenue, Annville, PA 17003-1400

<sup>2</sup>Department of Biology, Lebanon Valley College, 101 N. College Avenue,  
Annville, PA 17003-1400

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## Group KK – Chemical Sciences

**1<sup>st</sup>  
Place**                    **DESIGN OF A HIGHLY EFFICIENT, COST EFFECTIVE ANODE FOR CHLORINE  
EVOLUTION AND WASTEWATER TREATMENT**

Daniel Ocasio<sup>1</sup>, Yang Yang<sup>2</sup>, John Naviaux<sup>2</sup>, and Michael Hoffmann<sup>2</sup>

<sup>1</sup>Department of Chemical, Biochemical and Environmental Engineering, UMBC,  
1000 Hilltop Circle, Baltimore, MD 21250

<sup>2</sup>Division of Environmental Science and Engineering, California Institute of Technology,  
1200 E. California Boulevard, Pasadena, California 91125

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**2<sup>nd</sup>  
Place**                    **USING GEOGRAPHIC INFORMATION SYSTEM (ArcGIS) ON LAKES IN NORTH-CENTRAL  
MINNESOTA**

Jeronimo Ocampos<sup>1</sup>, Kenton Montgomery<sup>2</sup> and Daniel Lundberg<sup>1</sup>

<sup>1</sup>Department of Science, Technology and Mathematics, Gallaudet University,  
800 Florida Avenue NE, Washington DC 20002

<sup>2</sup>Department of Natural Resources, Central Lakes College, 501 W. College Drive, Brainerd, MN 56401

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Winners' List

**Group RR – Chemical Sciences**

**1<sup>st</sup>  
Place**

**EFFECTS OF SOLVENT ON THE IONIC LIQUID MEDIATED ELECTROCHEMICAL  
CONVERSION OF CO<sub>2</sub> TO CO AT A BISMUTH-BASED ELECTRODE**

Thomas P. Keane, John L. DiMeglio, and Joel Rosenthal  
Department of Chemistry and Biochemistry, University of Delaware, Brown Lab, 162 Academy Street,  
Newark, DE 19716

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**2<sup>nd</sup>  
Place**

**EXAMINING THE EFFECTS OF LIGAND STRUCTURE ON THE STEREOISOMERS OF  
RUTHENIUM (II) DICHLORIDE COMPLEXES WITH CHIRAL, TETRADENTATE  
AMINOSULFOXIDE LIGANDS**

Cassidy Stout and Tim Brunker  
Department of Chemistry, Towson University, 8000 York Road, Towson, MD 21252

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