

DEPARTMENT NEWS

Towson University Department of Chemistry

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A Message From The Chair

Welcome to Towson Chemistry Alumni, Students, Faculty and Staff! If you have not visited the Department recently, please drop by if you are in the area. Visitors are always welcomed.

A number of our Chemistry alums have contacted us in the last couple of years. However, there are a lot more of you out there whom we haven't heard from lately. The Department would very much like to keep in touch with you, to hear about what you did after leaving Towson, what you are currently doing and other milestones in your life. We can help you renew ties with your old classmates. Perhaps you can help our recent graduates find a position.

We are always interested in alumni giving seminars either on your personal research or on your experience in the working world. Contact us if you have interest in giving a seminar.

This spring we were excited to learn that the American Academy of Sciences (AAFS) had granted accreditation to our B.S. in Forensic Chemistry and M.S. in Forensic Science programs. We are one of only five institutions nationwide with both undergraduate and graduate programs accredited. Thus our Forensic programs join our Chemistry major program in being accredited by their respective professional societies.

Wishing all of you an enjoyable summer.

Richard Preisler, Chair

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Faculty Profile



Born and raised in Towson, Maryland, Dr. Cynthia Zeller grew up within walking distance of Towson University. While in elementary school, Towson students frequently came to her elementary school and provided enrichment activities in science, math and computer science, thus beginning a long association with Towson University and the Fisher College of Science and Mathematics.

Upon graduation from Loch Raven High School, she attended Hood College in Frederick, Maryland where she knew that she would be a science major, but had trouble deciding between Biology and Chemistry. At the time, no one had majored in both Biology and Chemistry at Hood, and she was told that it was not possible. Always up to a challenge, she majored in both Biology and Chemistry, developing an interest in cell-cell interactions. While at Hood, she was given the opportunity to intern in the laboratory of Dr. Robert Wiltrout at the Frederick Cancer Research Facility of the National Cancer Institute. As this internship required knowledge of immunology, she took a summer course in Immunology at Towson to prepare for this opportunity. Her honors thesis explored the role of biological response modifiers on the recruitment of Natural Killer cells to sites of tumorigenesis. This internship was instrumental in developing a love of research and discovery.

This was further fostered when she entered the Cell and Molecular Biology program at University of Alabama at Birmingham. Joining the laboratory of Dr. Richard Marchase, Dr. Zeller studied the role of cell surface 4 β -galactosyltransferase on contact dependent cell senescence in mouse fibroblasts.

During this investigation it was found that the cell surface enzyme was responsible for the conversion of glucosylceramide to lactosylceramide, which was further processed to produce the ganglioside GM3.

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The ganglioside GM3, inhibits cell growth by inhibiting EGF receptor dimerization, which is required for the initiation of cell growth and cell division. Following defense of her dissertation, Dr. Zeller joined the laboratory of Dr. Ronald Schnaar in the Department of Pharmacology at the Johns Hopkins School of Medicine, funded by a research fellowship in Rehabilitative Medicine and by a National Research Service Award.

Her postdoctoral research focused on the role of gangliosides on the neurite outgrowth initially in the peripheral nervous system. During this time, Dr. Zeller and then graduate student Lynda Yang developed a cell adhesion bioassay for the selection of cells which expressed protein receptors for various gangliosides. This work was continued and expanded upon in her second postdoc in the laboratory of Dr. Robert Shapiro in the same department, where she studied the role of gangliosides in neurite outgrowth in the central nervous system. Also while in Dr. Shapiro's laboratory, she worked on identifying the gene associated with oligodental digital dysplasia, a disease that is caused by the insertion of multiple trinucleotide repeats. This is where she initiated work with short tandem repeats that would later dominate her work in Forensic DNA Analysis.

Following her postdoctoral work, she then began work as a Research Associate in the Department of Urology also at the Johns Hopkins School of Medicine. In a change of focus, she studied the role of Nitric Oxide Synthase (NOS) and inhibitors of NOS on erectile dysfunction in the rat model using immunohistochemistry and other methods. It was during this time that Dr. Zeller was looking to alternatives to research in an intense environment, and changed careers to become an Analyst at the Maryland State Police (MSP) Forensic Science Division.

During her 5 years at the MSP, Dr. Zeller was a serologist and forensic DNA analyst and an expert witness in both of these fields. Concurrently, she taught both human ecology and forensic biology to MSP trooper candidates in the Associate degree program in conjunction with Frederick Community college.

Teaching in this setting allowed Dr. Zeller to share a joy of learning, especially science, to students that would not necessarily be exposed to that type of learning. After 5 years at the MSP, Dr. Zeller joined the Chemistry faculty in 2005. At that time, the forensic program was a fledgling one. The master's program had been conceived, but not yet approved or implemented. She spent much of the last 6 years, developing the program and developing courses for the program.

Additionally, she has developed a successful research program working on the development of novel methods for the identification of body fluids in forensic samples. In fact, the technique is currently under consideration for patenting. Nearly 50 undergraduate and graduate students have gained valuable research experience in her laboratory.

Dr. Zeller is an avid hiker and traveler as documented in the photos in her office! Through the years, Dr. Zeller has taken on many roles: student, teacher, researcher and mentor. She combines all of these roles as mom to teenaged daughters, Emily and Julianne. She lives in north Harford County with her daughters and husband of 20 years, John.

Faculty News

Dr. David Ownby and his wife Stacy had their second child on January 14, 2011. Colin Adams Ownby. Colin joins big brother Dylan.

Dr. Shirish Shah received The Ambassador of Knowledge Medallion at the 2010 World Forum held at Cambridge University in the United Kingdom. This was part of the 800th anniversary Celebration of Cambridge University. Dr. Shah on receiving the medallion was cited for his impressive achievements that display a wisdom and intelligence representative of the ideals of the University.

University Annual Service

Awards

This year the Department had a number of Faculty and Staff who received awards at the Annual Service Awards Luncheon.

Dr. Clare Muhoro and **Dr. Cynthia Zeller** both received the Five-Year Service Award.

Dr. Ryan Casey received the Ten-Year Service Award.

Dr. Lev Ryzhkov received the Fifteen-Year Service Award.

Mr. Rodney Dixon received the Twenty-Year Service Award.

Ms. Liina Ladon received the Thirty-Year Service Award.

Forensic Chemistry Program

Accredited

The American Academy of Forensic Sciences (AAFS) approved the accreditation of both the undergraduate and graduate Forensic Chemistry Programs at Towson at its annual meeting on February 19-20, 2011. This was the culmination of a lengthy assessment of the two programs which included a 3 day on-site visit in September 2010. The official announcement was made on February 23, 2011. Towson is 1 of 18 undergraduate and 1 of 17 graduate programs that have been accredited by the AAFS. The University becomes only the fifth institution that has both its undergraduate and graduate program accredited by the AAFS.

Forensic Chemistry Program

News

Forensic Program Director **Mark Profili** and Dr. **Ellen Hondrogiannis** attended the Mid Atlantic Association of Forensic Scientists Meeting in May in Virginia Beach, Va. where MSFS graduate Pamela Hummert gave a presentation of her research describing the identification of explosive residues on different auto fabrics using ICPMS.

The Forensic Program's Training Institute will be presenting a 3 day post-blast explosive residue training program to state and local forensic scientist on July 20-22, 2011. The training is sponsored by an OJP grant awarded to the program which also provided funds to purchase equipment and supplies for the training.

The Forensic Program Academic Advisory Board held its annual dinner meeting in Smith Hall on June 15th. The board consists of forensic professionals from the Maryland State and Baltimore City Police Crime Labs, NIST, FBI-CBRN Unit, BATF, BODE Technology and Qiagen as well as academia from the FCSM. The guest speaker was Ms. Sarah Cavanaugh, a 2010 Towson MSFS graduate who is employed at BODE Technology as a research forensic scientist.

The undergraduate and graduate forensic programs recently added the Delaware State and New York City Police Crime Labs, Quicksilver Analytics and McCormick Spices as new internship opportunities for its students.

Towson Forensic faculty, graduates, undergraduates and the Smith Hall Forensic Laboratories are featured in videos produced by two outside film companies. The videos are designed to supplement the teaching of Forensic Chemistry in a broad range of academic environments.

New Environmental Research

Facility

Construction has begun on a state of the art environmental research facility which will be located in part of the basement of Smith Hall. The new facility, when completed, will house Sample Intake Laboratories, Sample Processing Laboratories, an Instrument Laboratory and an Environmental Controlled Exposure Facility. The project is funded by a \$1.4M grant from the National Science Foundation.

Honors in Chemistry

The University approved a Departmental Honors in Chemistry Program during the 2009-2010 academic year. Students pursuing Departmental Honors in Chemistry must complete either the general or professional track or the Forensic Chemistry major requirements and in addition undertake at least three semesters of research culminating in writing and defending a Honors Thesis. During the 2010-2011 academic year, the Department graduated its first three students with Departmental Honors in Chemistry, Amy Smith, Stephanie Stanley and Caroline Christensen.

Faculty Publications

Mazzarino, R.C., Thomas, T.J., Sours, R.E. "Chromatographic determination of impurity binding affinities on biomineral crystals." *CrystEngComm*, 13 (2011) 1096-1102.

Fraind, A., Turncliff, R., Fox, T., Sodano, J. and Ryzhkov, L.R. "Exceptionally high decarboxylation rate of a primary aliphatic acyloxy radical determined by radical product yield analysis and quantitative 1H-CIDNP spectroscopy." *Journal of Physical Organic Chemistry*.

Brunker, T.J., Roembke, B.T., Golen, J.A., Rheingold, A.L. "Synthesis and structures of 1',2',3',4',5',-pentamethylazaferrocene complexes with Lewis Acidic Boranes. " *Organometallics* 2011, 30 (8), 2272-2277.

Kodali, V.K, Gannon, S.A., Paramasivam, S., **Raje, S.**, Polenova, T. and Thorpe, C. “A novel protein rich disulfide membrane from avian eggshell membranes.” PloS, 2011, March 30th.

Raje, S. authored an editorial accepted by the Journal of College Science Teaching.

 Chemistry Faculty

 Undergraduate Research Student

Faculty Presentations

M.C. Mazzei*, S.M. Lev, **D.R. Ownby**. “Developing a copper isotope ratio method for estimating copper availability to *Eisenia fetida*.” The Chesapeake—Potomac/Hudson—Delaware regional Society of Environmental Toxicology and Chemistry, Wilmington, DE. (1st place Undergraduate Poster)

K. Marsh, R.E. Casey. “Kinetics of Zn accumulation in the *isopod* Porcellio scaber exposed to contaminated diet.” The Chesapeake—Potomac/Hudson—Delaware regional Society of Environmental Toxicology and Chemistry, Wilmington, DE. (2nd place Undergraduate Poster)

J.J. New, J.W. Snodgrass, D.R. Ownby, R.E. Casey, S.M. Lev. “Zinc toxicity and transport in barley.” The Chesapeake—Potomac/Hudson—Delaware regional society of Environmental Toxicology and Chemistry, Wilmington, DE. (3rd place Undergraduate Poster)

A. Whiting, A.E. Pinkney, R.E. Casey, D.R. Ownby. “Water quality monitoring for the effects of road salt and suspended sediment on Yellow Perch (*Perca Flavescens*) in three tributaries of the Chesapeake Bay.” The Chesapeake—Potomac/Hudson—Delaware regional Society of Environmental Toxicology and Chemistry, Wilmington, DE.

K.E. Linford, R.E. Casey. “Impacts of zinc dietary exposure to *Lumbricus Terrestris*.” The Chesapeake—Potomac/Hudson—Delaware regional society of Environmental Toxicology and Chemistry, Wilmington, DE.

M. Willen and **S.E. Stitzel**. “Investigation of Molecularly Imprinted Polymers with Metal Cations.” The Colonial Academic Alliance Undergraduate Research Conference.

Preisler, R. S., Ashman, I., Nguemeta, C.T., and Ramos, S. L., “Transition Metal Complexes and the B—to—Z DNA Transition: the Role of charge, Conformational Entropy and Osmotic Stress”. Biophysical Society 55th Annual Meeting.

M. Brown, E. Dobbs, J. Snodgrass, D. Ownby. “Combined effects of sodium chloride and copper to the amphibian species, Cope’s gray tree frog (*Hyla chrysocelis*) and green frog (*Rana clamitans*)” The Society for Environmental Toxicology and Chemistry North America (SETAC NA) meeting in Portland OR, November 2010. (This presentation received 2nd place prize for Undergraduate Presentation)

V. Cates and **E. Hondrogiannis**. “Inductively Coupled Plasma/Mass Spectrometry Characterization of Sulfamide, a chemical Precursor to the Neurotoxin Tetramethylenedisulfotetramine.” International Forum on Process Analysis and Control, January 2011.

K. Peterson and **E. Hondrogiannis**. “The Elemental Composition of Cumin Samples Using Wavelength Dispersive X-Ray Fluorescence and Determination of the Country of Origin.” International Forum on Process Analysis and Control, January 2011.

P. Hummert and **E. Hondrogiannis**. “Method Development for the recover of Nitrates on Various Fabric Matrices Using Ion Chromatography with Conductivity Detection. International Forum on Process Analysis and Control, January 2011.

Wood, S.E., Taylor K.N., Brunker, T. J. 2011. “Synthesis and studies of RU(II) Complexes of Chiral Tetradentate Amino-Sulfoxide Ligands.” 25th National Conference on Undergraduate Research.

Bentivegna, B., Brunker, T. J. 2011. “Studies of the Reactivity of Azaferrocene-Borane and Synthesis of a Bis(Azaferrocene) Boronium Salt.” 25th National Conference on Undergraduate Research.

 Chemistry Faculty

 Undergraduate Research Student

 Graduate Research Student

Student News

At the Fisher College of Science and Mathematics Annual Convocation held on May 1st, a number of our Chemistry and Forensic Chemistry Majors were recognized for their Academic excellence. In particular the following students received awards and fellowships.

Caroline Christenson — Maryland Section ACS Award

Samantha Wood — Greater Washington Award

Kyle Wood – Gibbs Award

Brittany Davis — Polyed Award

Ying Li — Merk Award for Excellence in Organic Chemistry

Joe Blizzard — ACS Analytical Chemistry Award

Loan Dinh — CRC Press Freshman Award

Carlo Mercado — Raspet Summer Research Fellowship

Gorden Crews — Raspet Summer Research Fellowship

Travis Poulsen — Linda Sweeting Summer Research Fellowship

Elliot Glotfelty — Alan and Eileen Wingrove Scholarship

Emily Jay — Alan and Eileen Wingrove Scholarship

Kaila Hewitt — Alan and Eileen Wingrove Scholarship

Kaitlyn Polacheck — Alan and Eileen Wingrove Scholarship

Meagan Mazzei — Frank Milio Book Award

Loren Fierstein — SMACS Scholarship

Alumni News

We were very pleased to hear from the following Alumni.

Liina Ladon (Class of 1976) has been appointed to the Towson University Alumni Board of Directors as the Fisher College of Science and Mathematics Representative.

Douglas Raine (Class of 1969) informed us that after completing his active duty requirements in the Army Reserve and receiving an Associate of Arts from the Baltimore Junior College in 1966, he worked for FMC Corporation in Baltimore as a lab technician. He enjoyed polymer chemistry and transferred to Towson in 1968-1969 to complete his BS in Chemistry. Towson made it possible for him to continue his work career in composites. He is currently President of FGBT and Associates, a corrosion consulting firm.

Glenn Spangler informed us that he recently published a paper "Theory for Inverse Pulsing of the Shutter Grid in Ion Mobility Spectroscopy" in *Analytical Chemistry*.

We would like to hear from more of you. You can contact us at chemalums@towson.edu or on facebook.

'The Duck': Many of you will remember 'The Duck' some of you maybe with a touch of nostalgia. 'The Duck' mysteriously disappeared a number of years ago without a trace nary a feather was found; some even suspected foul play.

'The Duck' had become a "Cold Case": that is until about eighteen months ago; students working late at night in the SAACS Lounge some on the sixth re-write on their instrumental lab reports, some while being tortured by impossible P. Chem problems reported seeing an ethereal image of a Duck gliding through the lounge. Sightings were few at first but soon 'Duck' sightings became a regular occurrence. More recently reports have been circulating that the 'Duck' had returned and could be seen standing in one corner of the SAACS Lounge. After extensive investigations we can reveal that it appears to be true, there is a duck in the student's lounge, 'the Duck' has returned.

If you have any photographs of 'Duck's' past we would appreciate you sending us copies; if you know the history of 'the Duck' or have 'Duck' tales to tell, please send them to us. We will publish them in the next issue along with conclusive evidence that 'the Duck' has returned.

International Year of Chemistry

2011 is the International Year of Chemistry (IYC). The American Chemical Society has joined the global chemistry community in celebrating the IYC 2011, a United Nations designated year-long event to highlight chemistry and its contributions to humankind. This historic occasion is being coordinated globally by the International Union of Pure Applied Chemistry (IUPAC) and the United Nations Education, Scientific and Cultural Organization (UNESCO). IYC is intended to increase public appreciation of chemistry in meeting world needs, increase young people's interest in chemistry, generate enthusiasm for the creative future of chemistry, and celebrate the 100th anniversary of Marie Curie winning the Nobel Prize in Chemistry and the 100th anniversary of the founding of the International Association of Chemical Societies, now IUPAC, the International Union of Pure & Applied Chemistry. Visit www.acs.org/iy2011 to learn more and see how you or your organization can promote the IYC.

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