The Sierra Nevada Section
of the American Chemical Society

*presents*

“The Implications of Structural Conservation During Environmental Transformations of Steroidal Pharmaceuticals”

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Monday, May 5, 2014

- 5:30 p.m. Social Gathering
- 6:00 p.m. Thai Buffet by Bangkok Cuisine South
- 7:00 p.m. Presentation
- $15 members and guests. $10 students
- Tahoe Room, Super 8 Meadow Wood Courtyard, 5851 S. Virginia Street, Reno, NV 89502
- Please RSVP to Kent Ervin (ervin@unr.edu) by Wednesday, April 30, 2014.
Abstract:
In general, the existing regulatory and risk assessment paradigm for environmental contaminants is relatively simplistic, often equating contaminant transformation with significant reduction in associated ecological risk. However, there exist a number of contaminants whose behaviors in the environment confound this assessment paradigm and whose risk cannot be accurately assessed solely by laboratory studies demonstrating attenuation of compound concentrations in model environmental systems. For example, the vast majority of U.S. beef cattle receive growth promoting trenbolone acetate (TBA) implants, although TBA metabolites are potent endocrine disrupting compounds in aquatic organisms. TBA metabolites are often considered rather reactive and prone to degradation, thus limiting their persistence, and risk assessment studies specifically point to their rapid degradation as evidence for limited ecological risks. However, we have recently observed unexpected structural conservation during phototransformation for TBA metabolites allowing product-to-parent reversion processes to dominate their fate in sunlit waters. Also, a variety of structural analogs and stereoisomers can arise from transformation processes, likely yielding a suite of uncharacterized steroid structures capable of receptor interactions in the aquatic environment. These observations confound most all current environmental risk assessment and contaminant fate models, therefore improving our approach to environmental risk assessment needs to specifically account for transformation products and non-target receptor interactions for potent pharmaceuticals.

Biography: Dr. Edward P. Kolodziej is currently an Associate Professor in the Department of Civil and Environmental Engineering at The University of Nevada, Reno. His research interests include contaminant fate and transport, trace organic contaminants, endocrine disruption, and characterization of natural and engineered systems. Dr. Kolodziej received his M.S. and Ph.D. in Environmental Engineering from the University of California, Berkeley, and a B.S. in Chemical Engineering from the Johns Hopkins University.