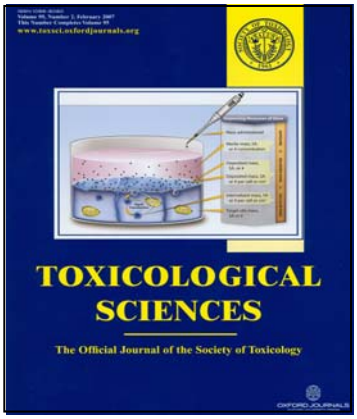
EBI Breaking News

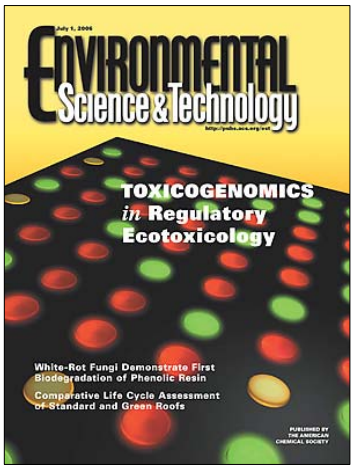
February 2007

At our Mid Year Review, the Committee suggested updates between meetings on key progress achieved within the Initiative. I think that is a great idea and we wanted to start it immediately. In this first update, we are highlighting three journal articles – one from each of the three focus areas -that were featured on journal covers which is one measure of EBI's impact on the science community. In each case, we have provided a link to the paper online along with a brief narrative on the importance of this research. Our intent is to alert you to new publications, grant approvals, or key conference activities as they occur rather than to send information to you on a set schedule. We hope you find this information useful.



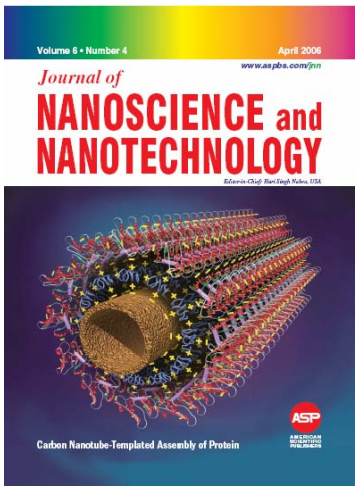
Teeguarden JG, PM Hinderliter, G. Orr, BD Thrall, and JG Pounds. *2007. "Particokinetics In Vitro: Dosimetry Considerations for In Vitro Nanoparticle Toxicity Assessments." Toxicological Sciences 2007 95 (2): 300-312.*
http://toxsci.oxfordjournals.org/cgi/reprint/95/2/300

To understand nanotoxicity, accurate understanding of the dose to cells is first required. Research results reported in this journal article improve the basis for *in vitro* assessment of nanoparticle toxicity by advancing the understanding of particle solution dynamics in cell culture media as they relate to dosimetry and dose-response assessment. Incorporating particokinetics and principles of dosimetry will significantly improve the basis for nanoparticle toxicity assessment, increasing the predictive power and scalability of assays, including those being developed within the SysTox Focus Area.



Ankley, GT, G Daston, S Degitz, N Denslow, R Hoke, S Kennedy, ***A Miracle****, E Perkins, J Snape, D Tillitt, C Tyler and D Versteeg, 2006. "Toxicogenomics in Regulatory Ecotoxicology: Potential applications and Practical Challenges." Environmental Science and Technology. 13: 4055-4065.*
http://pubs.acs.org/subscribe/journals/esthag/40/i13/html/070106feature_ankley.html

This feature article considers the roles of toxicogenomics in the field of regulatory eco-toxicology, explores current limitations in the science and practice of genomics, and proposes possible avenues to approach and resolve major challenges. The paper reviews current genomic methods, emerging regulatory challenges, how toxico-genomic data could be incorporated into a generic tiered testing framework for prospective ecological risk assessments, and challenges associated with incorporating toxicogenomic data into regulatory decision making. Much of the basis for this article came from a workshop sponsored by the Society of Environmental Toxicology and Chemistry (SETAC) in Pellston, Mich., Sept. 2005. Ann Miracle led a session at this workshop and is a co-author on the paper. The periphyton research within the Eco Focus Area is aimed at demonstrating the tools of toxicogenomics in an environmental setting.



Liu G, and Y Lin*. 2006. "Carbon Nanotube Templated Assembly of Protein." Journal of Nanoscience and Nanotechnology 6(4):948-953.*
http://www.ingentaconnect.com/content/asp/jnn/2006/00000006/00000004/art00005

As environmental biomarkers of response to biological agents are discovered within the RBA Focus Area, deployable detection systems that can detect these biomolecules at low concentrations and within complex environmental samples are needed. The nano-based technique described in this paper is being developed to achieve sensitivity and selectivity for just this purpose. A novel strategy is described for fabricating protein-polyion multilayers by electrostatic layer-by-layer (LBL) self-assembly on carbon nanotube templates. Such a non-covalent functionalization method is important for preserving the activity of biomolecular, mechanical, and electrical properties of carbon nanotubes. The image on the cover shows a self-assembly of enzymes on a carbon nanotube surface using a layer-by-layer technique. The authors demonstrated that multiple layers can be immobilized on a carbon nanotube surface yielding stable/high enzyme activities leading to the use of enzyme coated carbon nanotubes as labels for immunoassays of biomarkers.

Contact: Terri Stewart@pnl.gov
EBI Website: http://biomarkers.pnl.gov