

'Green nano' vision is now a roadmap for development

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(PhysOrg.com) -- A decade ago, University of Oregon chemist James E. Hutchison wrote an invited article in Chemical & Engineering News in which he envisioned "a generalized roadmap for the future design and development of green nanoscience materials."

That roadmap has grown up and is now in front of chemistry leaders worldwide with the publication of "Green Nanotechnology Challenges and Opportunities." The new "white paper" on the potential of incorporating benign chemistry practices was co-written by Hutchison. The American Chemical Society's Green Chemistry Institute issued the document, which is freely available at www.acs.org/greenreport.

Three of the five co-authors are from Oregon. In addition to Hutchison, Skip Rung, director of the Oregon Nanoscience and Microtechnologies Institute (ONAMI), and Robert Tanguay, professor of molecular toxicology at Oregon State University. The other two co-authors were Robert Peoples, director of the ACS Green Chemistry Institute, and Kira Matus of the London School of Economics.

"The roots of green nano are really deep here in Oregon," said Hutchison, who holds the Lokey-Harrington Chair in Chemistry at the UO. "This report mirrors the strategy that we have had for several years now. This is the way that things are going to be done. The report addresses the need for commercialization, for new policies -- a new science for addressing our societal needs. It's been 10 years in coming, but we are at the table now."

The report outlines the promise of green nanotechnology, which promotes the design of useful particles thousands of times smaller than the width of a human hair in a way that reduces or eliminates waste or the production of hazardous substances. It also spells out what actions need to be undertaken by the various stakeholders, Hutchison said.

When successfully implemented, green nanotechnology could lead to a revitalized and sustainable U.S. chemical and materials manufacturing base, the white paper says. Nanoparticles could well find their ways into medicine, electronics, energy production and other industries.

Much of the report emerged from Greener Nano 2010, the Safer Nanomaterials and Nanomanufacturing Initiative's Fifth Annual Conference in Portland, Ore. The conferences are organized by SNNI, a division of ONAMI that is headed by Hutchison. The ACS Green Chemistry Institute tapped the 2010 event to launch a series of annual summits in the fields of green chemistry and green engineering. The summit attracted some 120 representatives from academia, industry, and both non-governmental and governmental agencies from around the United States.

The 2010 event and Greener Nano 2011 in Cupertino, Calif., focused heavily on how to put the principles of [green chemistry](#) into commercialization, Hutchison said. The resulting "white paper," Hutchison said, "is a great example of the close partnerships we have with Oregon State University and ONAMI."

The Safer Nanomaterials and Nanomanufacturing Initiative is ONAMI's largest and most-successful research thrust. SNNI develops new nanomaterials and nanomanufacturing approaches that offer a high level of performance, yet pose minimal harm to human health or the environment. Having garnered more than \$45 million in research funding and more than 150 peer-reviewed publications, SSN leads the

nation in developing greener nanotechnologies.

More information: Download the Green Nano ["White Paper"](#)

Provided by University of Oregon

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