A Call for Clinical Studies

The aim of nanomedicine research is to develop nanotechnology for patient use and benefit, but, ironically, there are few nanomedicine publications that feature patient data. We might expect many such studies to be published in clinical journals such as *The New England Journal of Medicine* and *Lancet*, but this is currently not the case. Furthermore, most nanomedicine researchers do not seem to take advantage of the published nanomedicine studies in clinical trial databases to guide their research efforts. Published studies with patient data can (a) guide and focus researchers in their study goals, which will, in turn, be a more efficient use of time and resources to generate useful nanotechnology products and (b) temper the hype of the field by providing data on feasibility of a technology, which can have long-term positive consequences for the growth and expansion of the field.

A related question is why most papers published with a nanomedicine theme in top nanotechnology journals do not have clinical data to validate their claims. I suspect that most nanomedicine researchers are trained in chemistry, physics, engineering, or pharmaceutical sciences and lack clinical experience, while clinicians typically have not yet ventured into nanotechnology research without first securing collaborators in the field. As a result, physical scientists drive the nanomedicine field and rationalize studies based on a perceived clinical needs. This may explain why many nanomedicine studies have a recurring theme of applying nanomaterials to diagnostics, imaging, or therapeutics with few of these developments advancing to clinical utility.

I would like to pose a challenge to nanomedicine researchers: I encourage researchers or companies conducting nanotechnology-based clinical trials to submit and to publish research papers and to discuss both the negative and positive results of their trials in nanoscience and nanotechnology journals such as *ACS Nano*. I note that, at *ACS Nano*, we have deliberately reached out to the clinical community through forward-looking perspectives, reviews, and other articles to let them know what lies ahead in terms of the possibilities and challenges in nanomedicine.[1−5] We encourage the nanomedicine research community to begin using clinical samples in proof-of-concept studies to demonstrate direct clinical relevance. Such data would serve as a stepping stone for assessing real clinical utility and for building more robust clinical trial protocols in future trials. While this approach is likely limited to diagnostic applications for which clinical samples are available for testing, it is important for the community to consider the hurdles posed by validation of the technology in clinical trials and to design their preclinical studies with these downstream challenges in mind. Finally, we should, where possible, move beyond animal studies. Without proactive intervention, the limited clinical translation of nanomedicine risks undermining public confidence in the field and may inadvertently drive funding and, consequently, research focus, toward other fields that are perceived to generate more useful results.

I encourage researchers or companies conducting nanotechnology-based clinical trials to submit and to publish research papers and to discuss both the negative and positive results of their trials in nanoscience and nanotechnology journals such as *ACS Nano*.

Also, we are delighted to announce the winners of the 2014 *ACS Nano* Lectureship Awards, who were selected from an extraordinarily competitive pool of nominees. The winners are Prof. Amanda Barnard for the Asia/Pacific region, Prof. Chad Mirkin for the Americas, and Prof. Klaus Müllen for Europe/Africa/Middle East. The lectureships this year will be presented at NANO 2014 in Moscow, Russia on July 16.

Dr. Amanda S. Barnard is the leader of the Virtual Nanoscience Laboratory at the Commonwealth Scientific and Industrial Research Organization (CSIRO) of Australia. She is a pioneer in the field of thermodynamic cartography and is known for elucidating the phase behavior, stability, and environmental and health implications of nanomaterials.[6−8]

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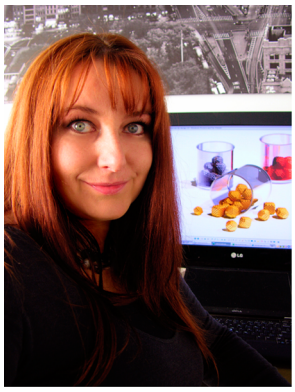
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The winners of the 2014 *ACS Nano* Lectureship Awards are (left) Prof. Amanda Barnard for the Asia/Pacific region, (center) Prof. Chad Mirkin for the Americas, and (right) Prof. Klaus Müllen for Europe/Africa/Middle East. The lectureships this year will be presented at NANO 2014 in Moscow, Russia on July 16.

Her work addresses single nanoparticles of specific shape and size, phase transitions of nanoparticles, and interactions of nanoparticles of controlled surface chemistry with the environment.

Dr. Chad Mirkin is the George B. Rathmann Professor of Chemistry, Professor of Medicine, Professor of Materials Science and Engineering, Professor of Biomedical Engineering, and Professor of Chemical and Biological Engineering, and Director of the International Institute for Nanotechnology and Center for Nanofabrication and Molecular Self-Assembly at Northwestern University. Prof. Mirkin has made numerous contributions to supramolecular chemistry, nanoelectronics, and nanopatterning.[9−12] He has developed biomolecules as synthons in materials science and invented many nanoparticle-based biodiagnostic and gene-regulation tools.[12,13]

Dr. Klaus Müllen is director of the Max Planck Institute for Polymer Research. Prof. Müllen develops new polymer-forming reactions and the chemistry and physics of small molecules, graphenes, dendrimers, and biosynthetic hybrids.[14−18] He has made pioneering contributions to chemistry and precise graphene nanoribbon synthesis. He develops structurally perfect materials that can be used for single-molecule detection, catalysis, labeling, and energy.

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Warren Chan

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Associate Editor

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