

Characterizing the Multidisciplinarity of Nanoscience Research

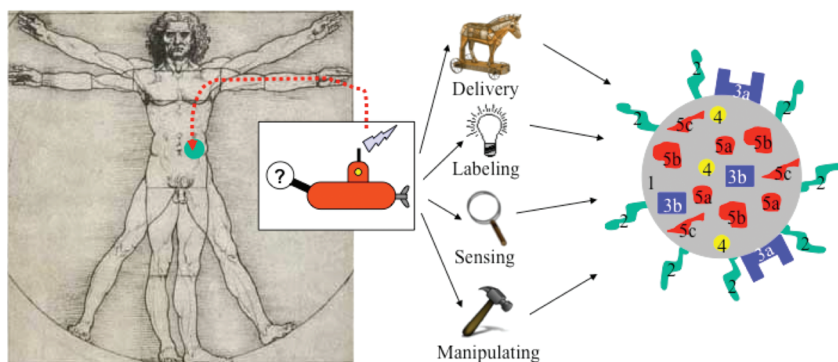
As *ACS Nano* continues to grow, we are receiving more and more submissions. Although this shows increasing interest and activity in nanoscience, it also attracts copycats who simply add the buzzword “nano” to their work in order to submit to journals with higher impact factors.¹ I do not want to define what nano is and is not, as this topic has already been discussed from many different perspectives.² Instead, I will discuss what qualities I feel are important for an article to possess to fit into *ACS Nano* and what distinguishes our journal from those of other disciplines. Certainly, nanoscience research crosses disciplines and has incorporated knowledge from many fields. The official scope of *ACS Nano* highlights this fact, stating, “*ACS Nano* is an international forum for the communication of comprehensive articles on nanoscience and nanotechnology research at the interfaces of chemistry, biology, materials science, physics, and engineering.” For example, nanomedicine now encompasses elements of established disciplines such as the colloidal chemistry of drug delivery. To echo the words of my colleague Prof. Moein Moghimi, with whom I recently discussed the multidisciplinary nature of nanomedicine: “Let’s not ignore the wealth of available information, based on the efforts and experience of many outstanding biological and pharmaceutical scientists in the traditional field of drug delivery (well before the advent of nanotechnology), and the clinical experience with the so-called regulatory approved nanomedicines; let’s learn from them. There is no need to re-invent the wheel! This field is increasingly multidisciplinary, but we are far from communicating adequately across broad disciplines, and digesting areas outside our field.”³

Although it is certainly true that nanoscience has benefited from the input of pre-existing disciplines, I think there is something special about nano itself and that it is important for nanoscience to have dedicated journals like *ACS Nano*.

As Associate Editor Jillian Buriak pointed out in her recent editorial,⁴ it is not necessarily about hunting for the “killer application.” For example, whereas life-science journals publish articles that attempt to solve biological questions, *ACS Nano* is dedicated to the effects that the nanometer scale has on material properties.

As an example, colloidal chemistry, and thus the historic context of quantum dots, has existed for hundreds of years. However, the impacts of scaling down semiconductor colloids to nanometer dimensions, and the resulting properties of those materials (e.g., size-dependent fluorescence), have only lately been popularized and understood. Though no

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Nanotechnology allows for the creation of highly advanced multifunctional composite materials. One vision would be applying such materials as local sonde for diagnosis and treatment.⁵

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killer application with quantum dots has yet been demonstrated, it is fascinating in itself that scaling down a material to nanometer dimensions has such a tremendous impact on material properties. Even considering the worst-case scenario, that quantum dots themselves might not make it to a future killer application, studying this system and understanding the consequences of reducing materials to nanometer size will teach us how to tune material properties to a point that surely will pave the way for other highly sophisticated materials with designed properties to reach manifold applications.

Characterization of the material is paramount in *ACS Nano*.

In this way, by emphasizing the materials and concepts arising from the nanometer scale, there is a clear distinction between *ACS Nano* and journals of other disciplines. Naturally, as a consequence, characterization of the material is paramount in *ACS Nano*. *ACS Nano* will not displace journals of other disciplines in general,

but our aim is to publish the best articles in which the nanometer size of materials or systems plays a major role, regardless of the discipline. To highlight the many different disciplines in which nanoscale effects play a role, we are initiating a series of “virtual issues.” In these issues, a selection of articles published in *ACS Nano* that relate to a single discipline will be collected and put into context. I am already assembling a virtual issue about nanotoxicology that will soon appear on our Web site; others will follow.⁶

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We received some good news at the end of last month as well. For three periods running, we have been ISI's “Rising Star” journal in chemistry.⁷ We are delighted at this honor and see our field's star rising across many diverse areas of science, engineering, and medicine; we are happy to help light the way.



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