Too Much Nano? Get Used To It

By Paul Livingstone, Senior Editor, R&D Magazine

Tired of carbon nanotubes? Me, too. Well, a little bit. Every day, when the editors search out the best R&D news on the web for the R&D Daily e-newsletter, it seems that carbon nanotubes and their endless variations dominates materials research news.

This is not entirely fair—nanotechnology is a dominant subject, and not everything small needs to involve carbon. And yes, I realize the potential importance of the remarkable electrical and tensile properties of these unique constructs if they can be leveraged everyday use. I, too, want aircraft unmolested by extraneous electrical fields. I, too, want to see long-life electrodes for lithium-ion batteries, and for researchers to find the magic formula for pure, aligned, centimeters-long aligned multi-walled tubes. But as I look at my desk calendar, I see that for the month of October I will be regaled by an image of a giant clump of carbon nanotubes from last year's Nikon Small World [1] competition. Hmmm….it seems I can't escape them.

So, if this is to be my muse for next month, perhaps it's worthwhile to reflect on the image. Isn't it interesting that as little as 10 years ago it was difficult to even create nanotubes, much less obtain such brilliant photomicrographs? When Nikon's Small World started, in 1974, no digital cameras existed, which greatly complicated the process of capturing images. The first place finisher's 350x image in 1977—James W. Smith's image of crystals of quartz and titanium dioxide [2]—was a significant technical achievement given the complex lighting scheme of differential interference contrast imaging and the lack of anything resembling a charge-coupled device.

Coincidentally, the other big photomicrography contest is wrapping up its entry process at the end of September. Olympus BioScapes [3], held opposite to Nikon's competition every fall, is a similarly colorful look at some of the most artistic and remarkable byproducts of scientific discovery in the life science. It's hard to call these images pure art, as they are not typically created for their own sake. But it is a stimulating glimpse at the world of the small, and how our eyes can both reveal information and form bizarre connections.

A 10x image of mytomycin [4], for example, can reveal what looks like an otherworldly moonscape. The polarized light photomicrograph of a snail's radula (6th place Olympus BioScape image) [5], on the other hand, calls to mind the bright plasticky patterns formed by a toy kaleidoscope.

We can thank CCD detectors for these brilliant images, and constant improvement has put them at the disposal of the light microscope's non-optical cousins, scanning probe and electron. These microscopes can dive to the refraction limit of light, imaging some of the smallest known structures. Which, of course, means I'd better get used to more and more images of carbon nanotubes. We all should.

Are you tired of hearing about carbon nanotubes? Drop me a line at paul.livingstone@advantagemedia.com [6].

Links:
[1] http://www.nikonsmallworld.com/
[2] http://www.nikonsmallworld.com/gallery.php?grouping=year&year=1977&imagepos=1
[3] http://www.olympusbioscapes.com/
[4] http://www.nikonsmallworld.com/moreinfo.php?grouping=year&year=2008&imagepos=7
[5] http://www.olympusbioscapes.com/gallery/2008/
[6] mailto:paul.livingstone@advantagemedia.com