Nanotechnology

The Next Big Thing, or Much Ado about Nothing?

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The

art and science

of building stuff

that does stuff

at the nanometer scale

Richard Smalley

Smallness

Ilan Kelman, http://www.ilankelman.org/traffic.html

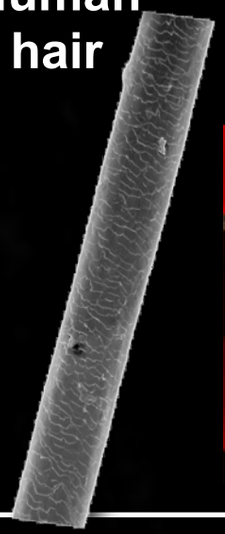
Human-scale

Nano-scale

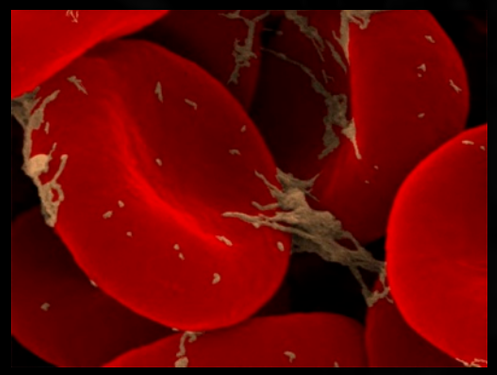
Twinkie

Pin-head

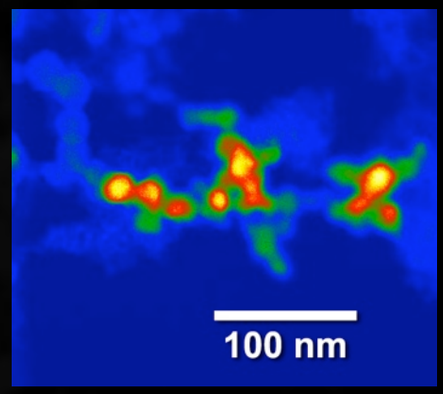
Human hair



Red Blood Cell

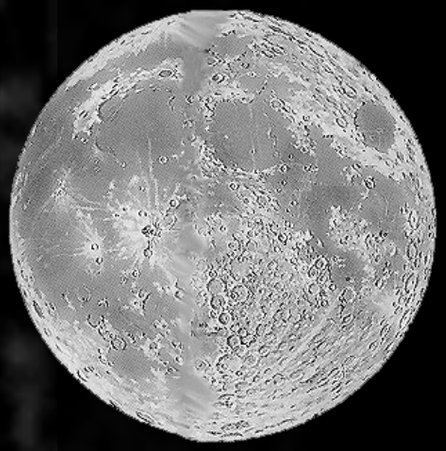


Welding fume



DNA

10 cm | 1 cm | 1 mm | 100 µm | 10 µm | 1 µm | 100 nm | 10 nm | 1 nm



Relative sizes

Cats & Dogs

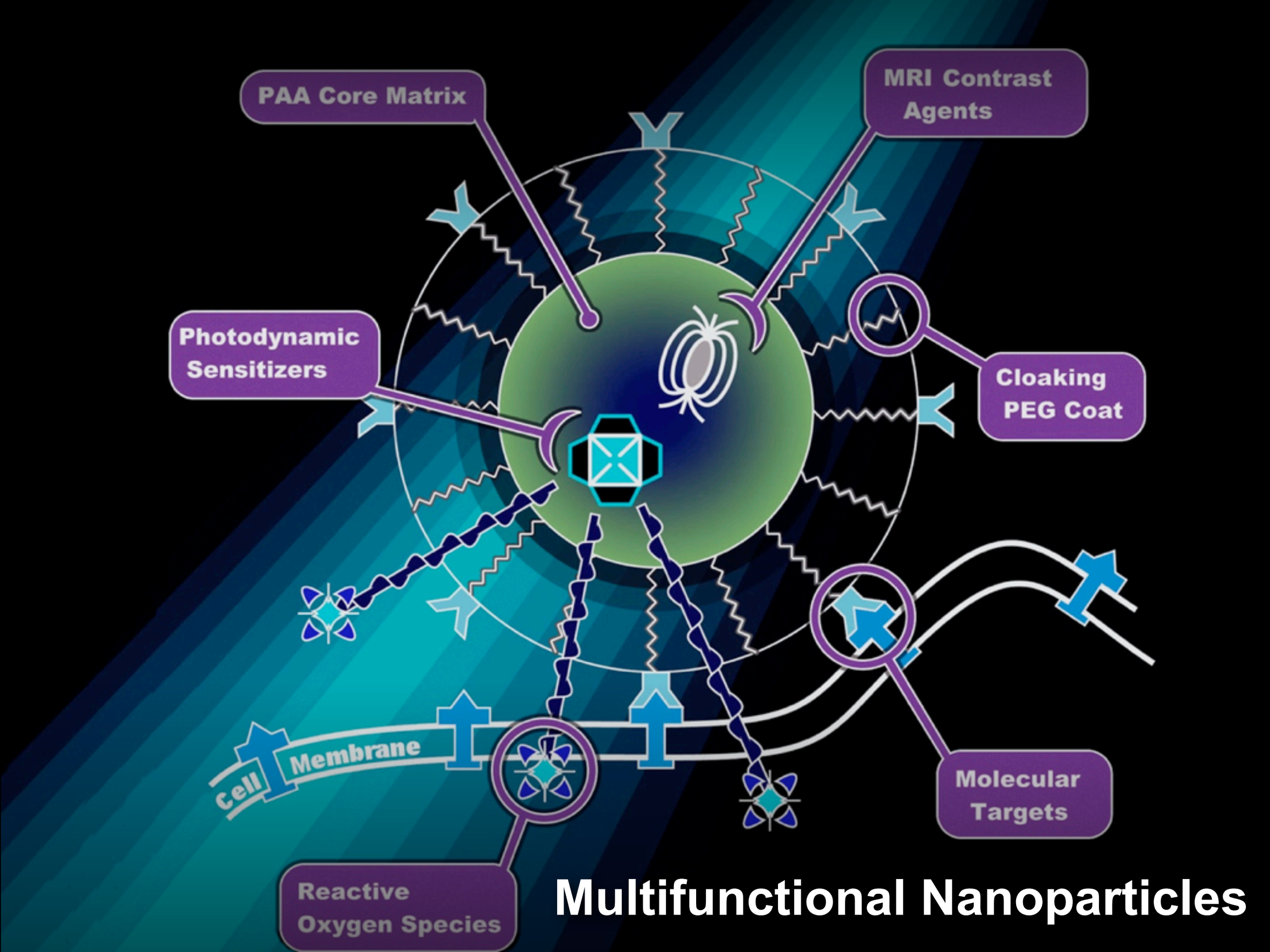
Picasso


Sophistication


BUGS BUNNY
Surf

Nathan Sawaya

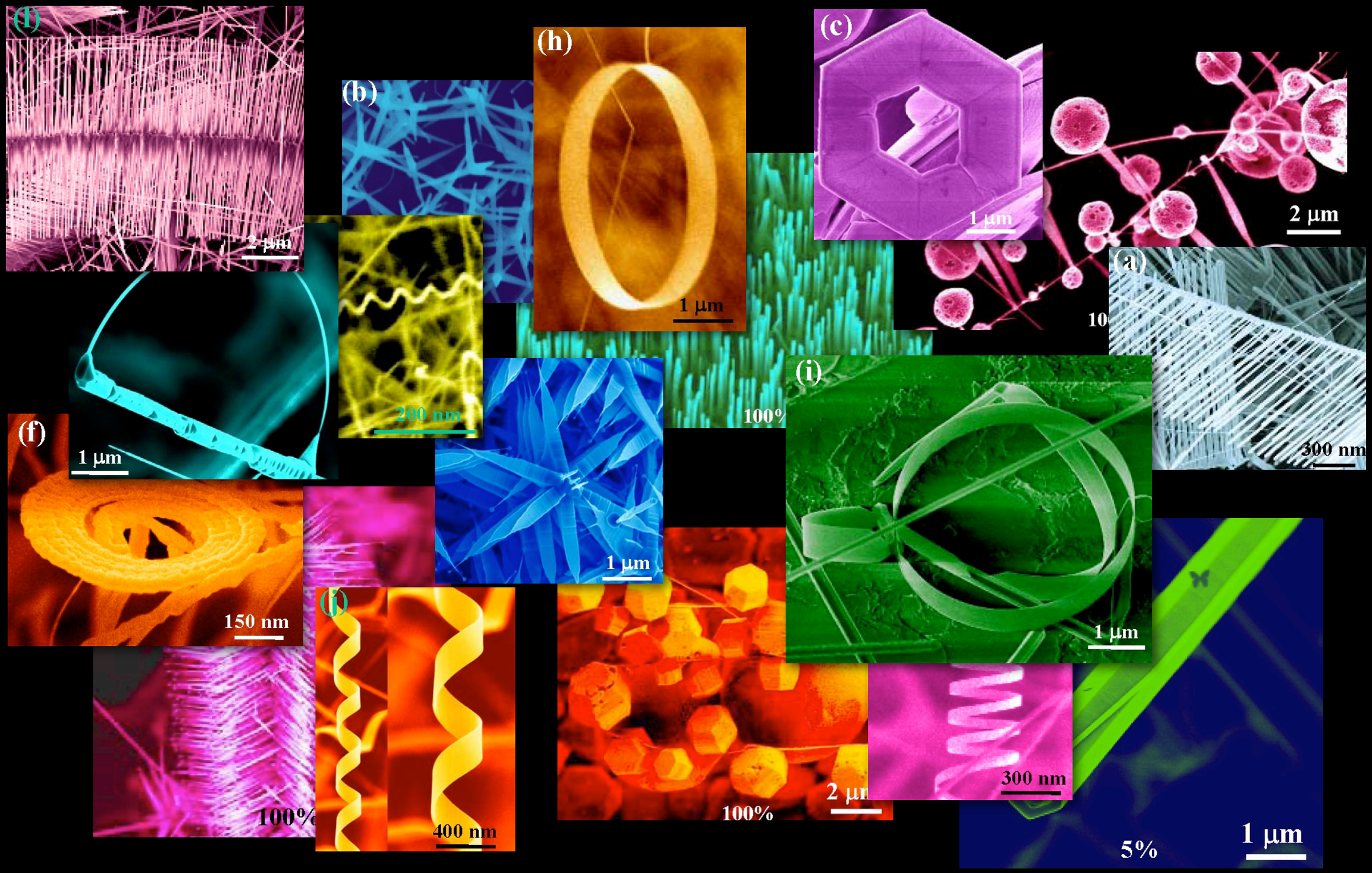
Figures are from a traveling exhibit - contact Nathan Sawaya for further details, at info@brickartist.com



Multifunctional Nanoparticles

Similar Chemistry

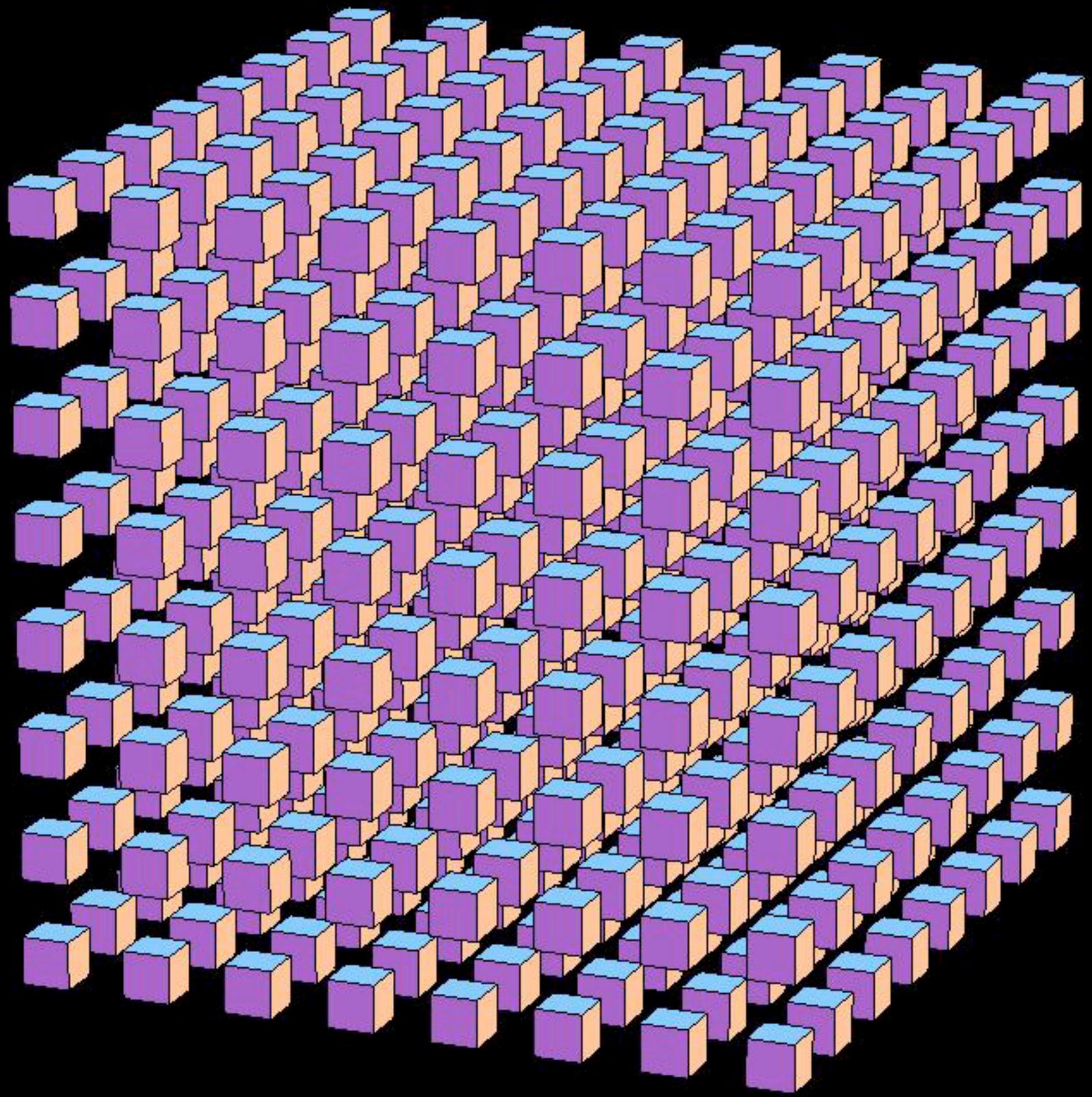
Different Risks



Nano-ZnO: One chemistry, many shapes

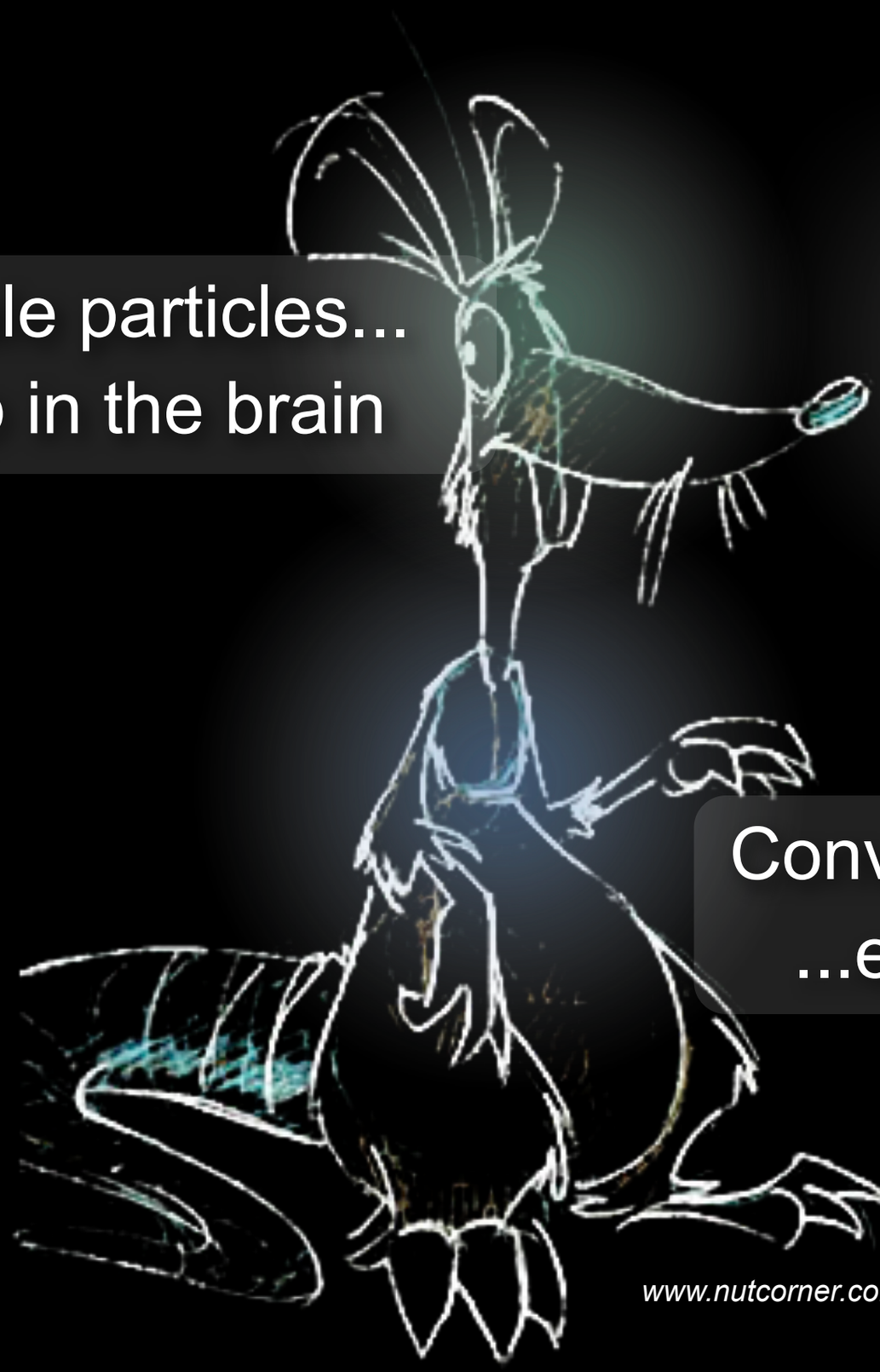
Courtney of Prof. Z.L. Wang, Georgia Tech

Nanoparticles do not play by the rules



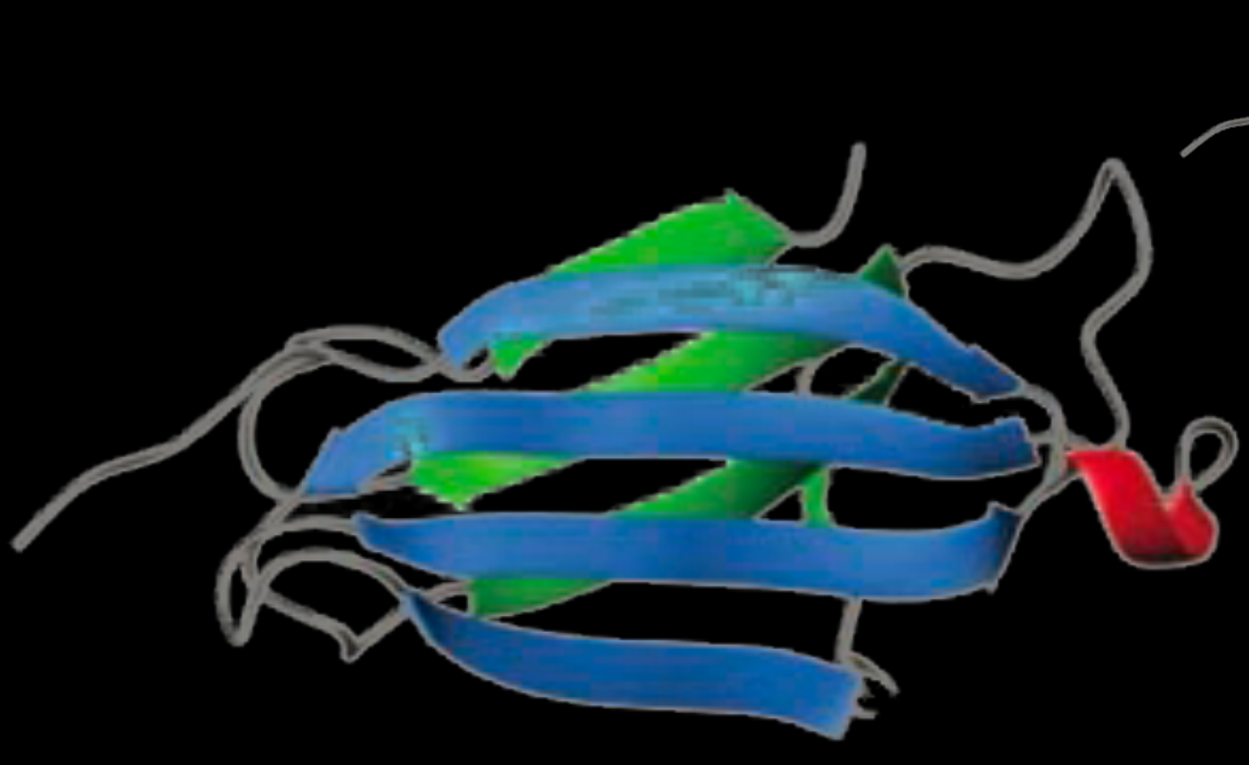
www.youtube.com/watch?v=gcOzMRFO0I4

Nanoparticles get to the places other particles cannot reach

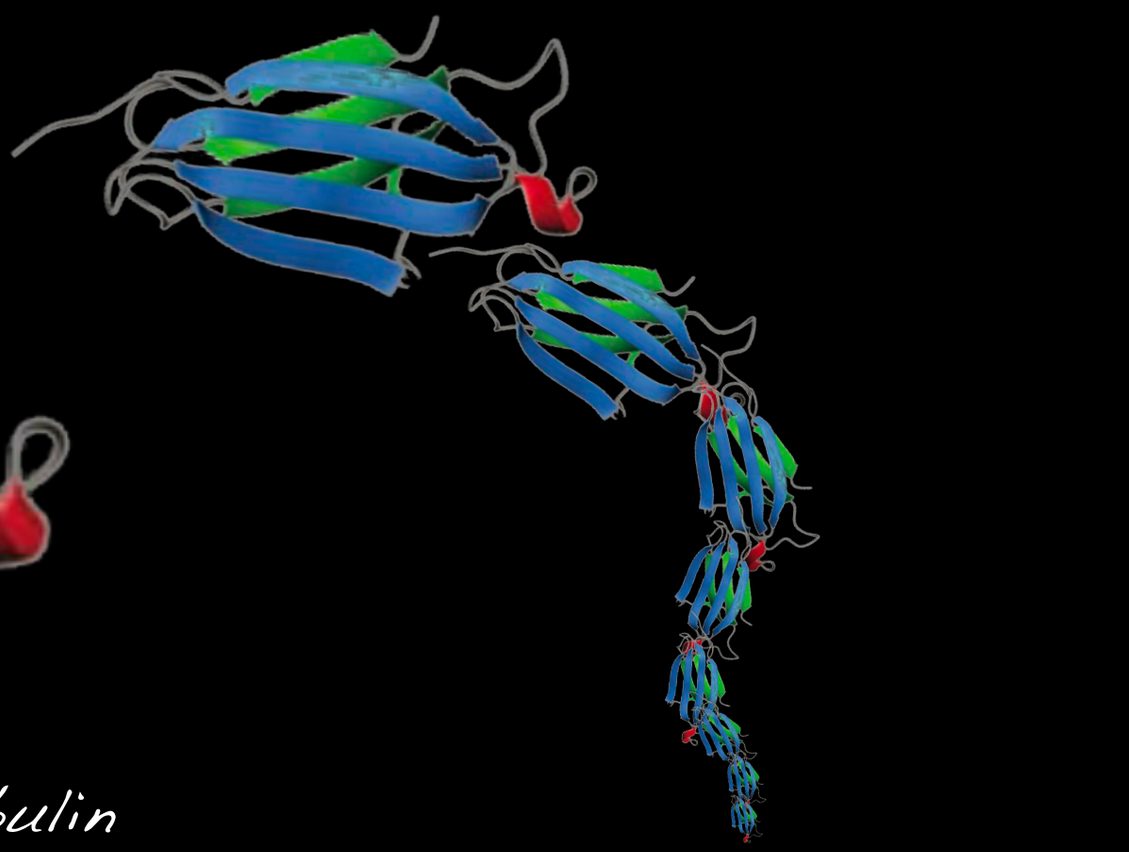


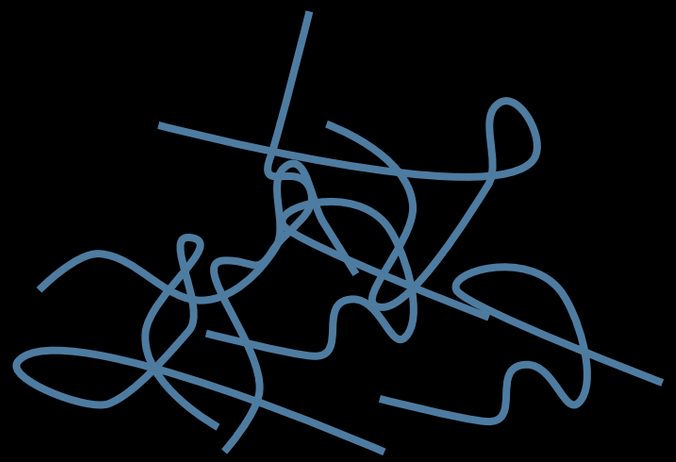
(Based on Oberdörster, G., *et al. (2004)*, *Inhal. Toxicol.* 16 (6-7), 437-445)

Nanoparticles might even interfere with biology



beta-2 microgobulin

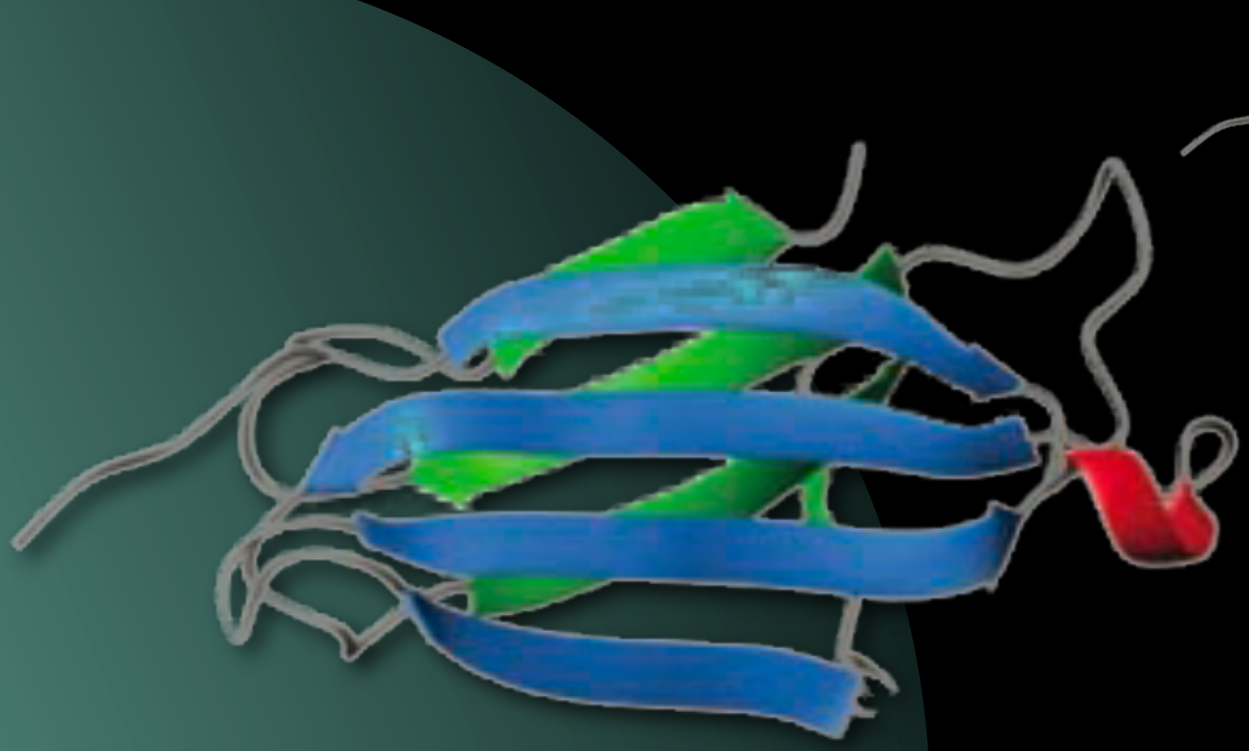




fibrillated protein

Linse et al. (2007), *Proc. Nat Acad Sci USA.* doi:10.1073/pnas.0701250104

Nanoparticles might even interfere with biology



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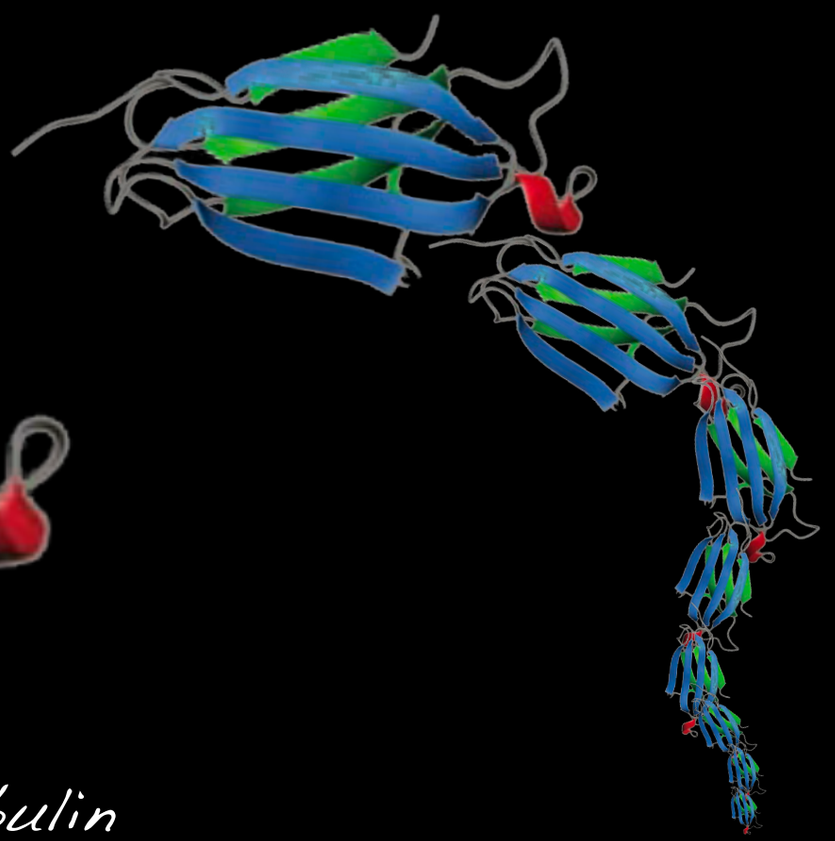

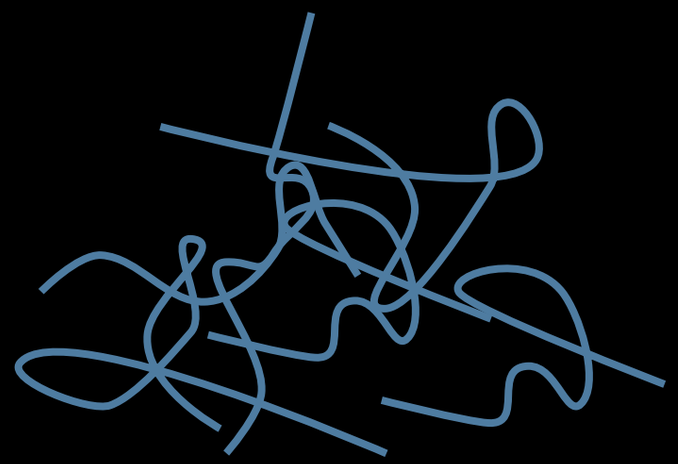

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Advanced Materials

Therapeutics

Renewable Energy

Clean Water

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