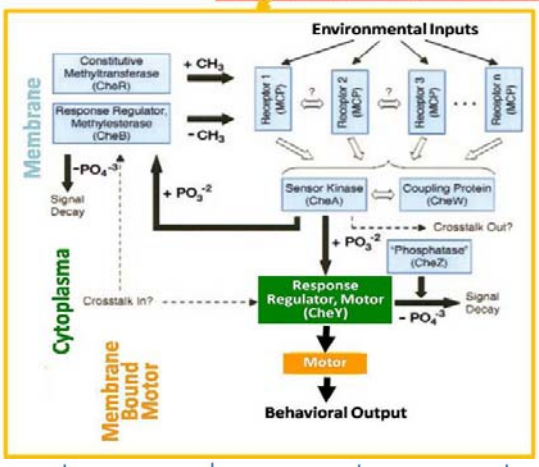
Journal of
Nano Systems & Technology

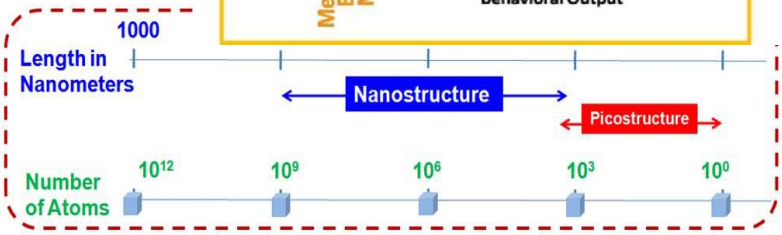
October, 2009 |www.jnst.org

JNST.2009

JNST Editorial: ***Is nano useless without micro and macro?***

A clue to the above question might come from another question: 'was, is or will nano be everywhere?' The detailed answer may be subjective but my answer is 'all of the above'. For example, if I drink a glass of milk, the E. coli bacteria in my intestine, in the presence of large amount of milk lactose, will produce an enzyme called β-glactosidase, which breaks down the lactose into glucose (that E. coli munches on) and glactose. How does E. coli produce β-glactosidase only when needed?





A generally accepted definition of a nano-structure is an object with at least one dimension below approximately 100 nm (see figure), where the physical properties of materials start changing. The technology needed to fabricate such structures is called nanotechnology. It is also expected that the future Nanosystems, the systems with a larger number of nano components than those found in the current Nanosystems, will be 'zero-energy' systems, meaning that they, like the E. Coli, will scavenge the energy, that they need for their operation, from the environment surrounding them. In other words these systems will be able to 'sniff' their environments to ensure their survival and perhaps their reconfiguration.

It is also interesting to note that for dimensions in the range of 1 - 2 nm or smaller, it is difficult if not impossible to define the physical properties of materials because the number of atoms is too small to define a useful physical property. Such a structure may be called a picostructure and the related systems as the Pico Electro Mechanical System (PEMS). New concepts are required to define the physics at the pico-scale before PEMS become useful.

I hope that the first issue of JNST will set the stage for exciting publications in the future issues. Our goal is to encourage and publish articles about breakthrough nano science, technology and nano-systems. I am thankful to the authors, editorial board and the publisher for making the first issue a reality.

Dean M. Aslam