

Small May be Big, but it Isn't New

The God of the infinite is the God of the infinitesimal.

Small is big. Nanotechnology is the new marketing buzzword, with the Apple iPod Nano a case in point¹. Going small is big business and has many potential applications, including targeting and treating cancer cells. Others see the potential to create smaller, more powerful computer chips² or even human/machine hybrids. In his new book, *Nano-Hype*, David Beube comments that nanotechnology is not really new but is the same old science on a smaller scale³. I agree but would go a step further and say God was into nanotechnology from the very beginning and that life was purposefully built on a series of biomechanical “nano-machines.”

One essential nano-machine is the water molecule. Water is composed of three atoms, two of hydrogen and one of oxygen, joined in the sequence H-O-H.

Two sets of unpaired electrons on the oxygen atom force the molecule to bend to an obtuse angle of about 105 degrees. Bent in this way, one water molecule spans about three tenths of one nanometer in width. One nanometer is one billionth of a meter. This bending gives water a slight negative electrical charge on the oxygen end and a slight positive charge on the hydrogen end. It is this tiny separation between electric charges which makes life possible.

Your body is 60% water by weight and almost all the space inside your cells not occupied by biological molecules (DNA, fats, and proteins) is filled with water. Water is the master electrical manager in living cells. The positive and negative ends of the water molecule give it the ability to form attachments with other water molecules and to cover charged parts of biological molecules with a

water shell. The positively charged ends of fat molecules attract the negative ends of water molecules and the long, electrically neutral carbon chains in fat molecules repel water, preferring instead to group together. It is these

forces of attraction and repulsion between water and fat that create the double-layered cell membrane of each of our 60 trillion cells and, without this membrane, there is no life.

The nano-technology of water is also essential to our senses of taste and smell. To be tasted or smelled a substance must first be dissolved by water. Only then can it touch a receiving site on the olfactory cells of the nose or gustatory cells of the tongue. This tiny interaction outside the cell triggers a cascade, or series, of other nano-events inside the cell, causing a nerve impulse along the cell membrane. The impulse eventually reaches the brain

which interprets it as sour, bitter, sweet, or salty.

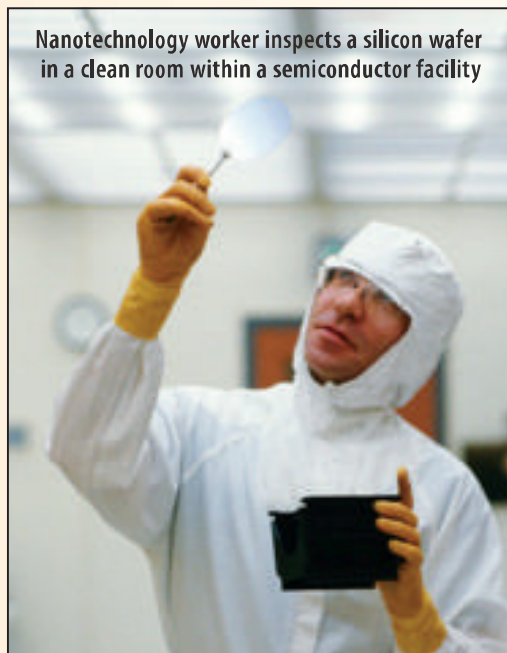
Water is but one example of a biomechanical nano-machine. Many, many others exist within us and the various plants and animals on earth. Each machine is finely tuned, organized, and integrated with multiple other machines to form a functional whole. This is a scale of miniaturization and purposeful, balanced complexity that could only come from the mind and hand of the Creator. Small may be big, but it is not new.

—MICHAEL G. WINDHEUSER, PH.D.

1 L Langdon, “Small Science,” *World* (Mar. 4, 2006): pp. 32-34.

2 PJ Kuekes *et al.*, “Crossbar Nanocomputers,” *Scientific American* 293, no. 5 (Nov. 2005): pp. 72-80.

3 DM Beube, *Nano-Hype* (Prometheus Books, 2005).



Nanotechnology worker inspects a silicon wafer in a clean room within a semiconductor facility