Future Applications

The pharmaceutical and chemical industries are being impacted greatly by nanotechnology. New commercial applications of nanotechnology that are expected in two to five years in these and other industries include:

• Advanced drug delivery systems, including implantable devices that automatically administer drugs and sensor drug levels;

• Medical diagnostic tools, such as cancer tagging mechanisms and lab-on-a-chip, real time diagnostics for physicians;

• Cooling chips or wafers to replace compressors in cars, refrigerators, air conditioners and multiple other devices, utilizing no chemicals or moving parts;

• Sensors for airborne chemicals or other toxins;

• Photovoltaics (solar cells), fuel cells and portable power to provide inexpensive, clean energy, and

• New high-performance materials.

It's hard to predict what products will move from the laboratory to the marketplace over longer periods, but it is believed that nanotechnology will facilitate the production of ever-smaller computers that store vastly greater amounts of information and process data much more quickly than those available today. Computing elements are expected to be so inexpensive that they can be in fabrics (for smoke detection, for instance) and other materials.