

Mt. Pleasant company achieves breakthrough

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Science is a lot like any other business. Faster and cheaper rules when it comes to profit margins and aggressive competition.

Dendritic NanoTechnologies Inc. of Mt. Pleasant is living that rule on the molecular level. A recent breakthrough in precision dendrimer nanostructures promised to make the previously expensive substance available for a wide range of

New development

A breakthrough by Dendritic NanoTechnologies could "change the economics of nanotechnology," according to the company's CEO. The new process creates product in a matter of days, rather than the up to a month that it took before.

commercial uses.

"We are going to change the economics of nanotechnology," DNT CEO Robert Berry said. Incorporated in 2003, DNT leases space in the Central Michigan University Center for Applied Research and

Technology. "We've gone from hundreds or thousands of dollars per gram down to the tens of dollars a gram. It's a quantum advance in terms of technology."

The trademarked Priostar dendrimers can be created in a

matter of days and with just a few steps, depending on the structure, while previous dendrimers could take eight or more steps and up to a month of processing time.

Priostar dendrimers also are much more stable, able to withstand temperatures up to about 350 degrees Celsius, while earlier versions topped out near 130 degrees Celsius, before breaking down.

Dendrimers are sphere-shaped structures that are only

billionths of a meter wide. It would take about 125,000 nanometers to equal the width of a gnat's eye.

Grown around a core with arms radiating in all directions like symmetrical tree branches, the dendrimer is capable of combining with a dizzying assortment of chemicals. Various substances can be carried within the interior of the dendrimer or attached to the ends of the "branches" to create

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"We have a Ph.D. chemist here at CMU who never thought this was possible, but we are doing it everyday in our labs," DNT President and Chief Technology Officer Donald Tomalia said.

The potential is staggering. Cancer drugs could be loaded into the hollow spheres and the

dendrimers targeted to precise kinds of cells, making the toxic drugs less likely to harm healthy tissue or sicken the patient.

Other potential applications besides pharmaceuticals include food and agriculture, energy, electronics, environmental and industrial safety, personal, household, chemical and manufacturing markets. A selection of products that could benefit from the technology include diagnostic imaging, gene therapy, coatings, sensors, lighting, detergents, antimicrobials, lotions, cosmetics, pigments and dyes.

"This should enable Dendritic NanoTechnologies to become a very profitable company," Central Michigan University Research Corp. President and CEO Nathan Long said. "Profitable companies add jobs to their communities."

DNT has 19 employees, 12 of which have doctorate degrees, Berry said.

A patent for the Priostar family would add to the more than 200 patents DNT owns with 13 more already filed.