



## Notes from the Nanotechnology Conversation

Nanotechnology: From Port Security to Sunscreen

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Speakers: John Bumgarner, PhD, Director, Microscience Engineering Laboratories and Priscila Spagnol, Ph D, senior research scientist, SRI International, St. Petersburg and Roxanne Ebert, formulation scientist, Dermazone Solutions, St. Petersburg

John Bumgarner and Priscila Spagnol, SRI International: About Growing Diamonds

1. SRI grows synthetic diamonds through nanotechnology. Growing diamonds is a newer application. It takes four days to grow half a wafer. Fifty are grown a year. Growing diamonds in this way is not an economic way to produce them.
2. It takes half a million in equipment to grow diamonds.
3. These diamonds are grown for its interesting and unique properties.
4. Created diamonds are in the shape of "wafers." They are crystal in structure and polished. A two-inch wafer is valued at \$3,000-5,000. A natural diamond of this size does not exist.
5. Wafer diamonds don't make good computer chips as they are hard and conduct heat.
6. The diamonds spread or dissipate heat quickly.
7. Diamonds don't burn and might make a good re-entry window for space.
8. Other direct applications for the diamond wafer: cut into a funky radiator shape to spread heat; build on a thin layer of diamond to spread heat out.
9. The diamonds can last for 30-35 years.
10. Growing diamonds is not unusual. It's being done by universities and other companies for electronic devices and research.
11. Nanotechnology and solar collectors is something we're interested in.

Roxanne Ebert, Dermazone Solutions: Nanotechnology and Skin Care Products

1. Nanotechnology is used to create skin care products. Dermazone's patented Lyphazome Technology is a nanotechnology carrier system that penetrates the epidermis and releases ingredients.
2. As formulations scientist, Ebert creates product formulas.
3. By scientific design, nanospheres or microspheres,  $1/50^{\text{th}}$  the size of a human skin cell, carry the product to deeper levels in your skin.

4. The product is applied to the skin. The microspheres, the size of .2-.3 microns, containing the bioactive/active ingredients travel through the skin. The ingredients are slowly released when the microspheres break apart at a certain time.
5. Lyphozome Technology is not used for cancer treatment as it is designed to penetrate the epidermis, not the blood stream.