

Nano Gold Electrical Connections (Yissum)

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[Uri Banin](#), HUJI, Faculty of Science, The Center for Nanoscience and Nanotechnology

Metal tips act as 'alligator clips' on semiconductor nanorods

Categories	Semiconductors, Nanocrystals, Microelectronics
Development Stage	Development of technology in various directions, including wiring to electrical circuits
Patent Status	U.S. patent application filed
Market Size	Nanoelectronics market \$1.8 billion in 2005, to reach \$ 4.2 billion by 2010.

Highlights

- Gold-tipped nanocrystals – nanodumbbells – for nano sized transistors
- Building blocks for miniature computers, nanosensors for chemical and biological molecules, and for biomedical applications
- Prototypes of gold-tipped rods and tetrapods demonstrated in the lab.

Our Innovation

A simple solution, phase reaction for controlled selective growth of gold and other metal tips onto semiconductor rods and tetrapods (structures with four arms or legs).

Key Features

- Gold tips provide a method for wiring nanocrystals into miniature electronic circuits
- Provide good electrical contact for speedy and faultless communication channels
- Tips are natural anchor points to serve as recognition elements for directed self-assembly
- Self-assembly schemes can be used for the parallel wiring of billions of nanorods onto nano-electronic circuits, vastly increasing computer speed and memory

Development Milestones

- Expanding method to additional semiconductor materials and metals
- Investigating approaches for wiring of nanodumbbells is in progress

The Opportunity

- Nanoelectronics includes advanced technology developments, such as molecular electronics, self-assembly using biotechnology, and quantum computing. These developments are expected to emerge in the post-2014 timeframe. These will be ten times more powerful than first generation nanoelectronics, providing a quantum leap in the electronics market over the next 10 years followed by another massive increase in capabilities in the 10 to 20 year horizon.

Contact for more information:

Dov Reichman , VP Business Development - Chemistry & Physics, +972-2-6586692



Yissum Research Development Company of the Hebrew University of Jerusalem
Hi-Tech Park, Edmond J. Safra Campus, Givat-Ram, Jerusalem P.O. Box 39135, Jerusalem 91390
Israel Telephone: 972-2-658-6688, Fax: 972-2-658-6689