Breakthrough In AFM Opens New Avenues Of Research in Nanoscience

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Molecular Imaging is an Research and Development 100 Awards winner for its new PicoTREC. The awards are sponsored by Research and Development Magazine and recognize the top 100 products introduced into the marketplace during the year. PicoTREC is the only commercially available instrument to add real-time, simultaneous **T** opography and **REC**ognition imaging capability to the atomic force microscope (AFM). A breakthrough tool for AFM, PicoTREC allows researchers to pursue new avenues of discovery in all areas of nanotechnology and nanoscience.

"We are honored to be the recipient of the R&D 100 Awards and to be ranked among the world's top technology innovators," said Vance Nau, President and CEO. “This award is an acknowledgment of Molecular

Imaging's commitment to creating innovative new products and techniques for our customers that will enable new application areas for AFM in academic and industrial research."

PicoTREC, used together with Molecular Imaging's PicoPlus® SPM (Scanning Probe Microscope) and MAC Mode® (Magnetic AC mode), represents a new product category for AFM. PicoTREC improves the speed, sensitivity, and accuracy of recognition and adhesion studies at the molecular level. Therefore, it can be used to greatly accelerate existing research and to perform experiments that were not possible before. It is a label-less detection methodology so sensitive samples are not changed by the introduction of radioactive, fluorescent, and other markers. Furthermore, single molecule sensitivity is not only possible, with PicoTREC it is routine.

PicoTREC creates new possibilities for using AFM in life science, materials science, electrochemistry and other fields. For example, PicoTREC offers researchers in cell biology, nanobiotechnology and pharmacology the ability to explore dynamic properties of molecular binding events. It enables studies on a host of ligand-receptor interactions including membranes, cells, antibody-antigen, drug-receptor, DNA-protein, DNA-DNA, and smart materials. In addition, for scientists studying the characteristics of data storage media including CD's, DVD's and hard drives, or sensors, polymers and other materials, PicoTREC provides a better understanding of the molecular level structures and interactions that influence their behaviors.

An international team worked on developing PicoTREC. "The original idea came from a group lead by Dr. Peter Hinterdorfer at the University of Linz, Austria," said Nau. "The engineering team at Molecular Imaging led the effort to turn the concept into a product. They worked in concert with the group at Linz and members of the Lindsay Lab at Arizona State University in Tempe, led by Professor Stuart Lindsay, who helped to

refine the product." Nau continued, "The efforts of these outstanding organizations working together have allowed us to bring the unique capabilities of PicoTREC to market."

"Oscars" of Applied Research
Often called the "Oscars" of Applied Research, the 42-year-old R&D 100 Awards program honors the most technologically significant new products and processes of the year. Corporations, government labs, private research institutes, and universities worldwide submit entries for the coveted awards. Technologies are nominated in open competition and judged by a large panel of technical experts in a variety of disciplines. The judges look for breakthrough products or processes that promise to improve people's lives through technological advances.

Key innovations receiving past R&D 100 Awards include the development of Fluoronanotubes, Plastic Rechargeable Lithium Ion Battery, Real Time Ultrasonic Imaging System, Scanning Confocal Electron Microscope, High Speed Fiber Optic Sensor System, and the In Situ Electron Microscope Microtome System. Many other R&D 100 Awards winners are now household names – Polacolor film, antilock brakes, the fax machine, halogen lamp, antismoking patch, automated teller machine, liquid crystal display, high-definition television and Taxol the anti-cancer drug. The complete archive is available at www.rdmag.com/rd100ach/Default.aspx.

The 42 nd annual R&D 100 Awards ceremony, exhibits and banquet will take place October 14, 2004 at the Navy Pier in Chicago.

Source: Molecular Imaging