Dai also exploited this unique control over nanotube growth to uncover basic electronic properties of metallic and semiconducting nanotubes.

Over the past several years, Dai and his group have defined the fundamental limits of nanotube transistors and, in doing so, have raised the level of awareness of nanomaterials to some of the largest semiconductor companies. He also pioneered the use of nanotubes as intracellular molecular transporters for biological molecules and cancer drugs, demonstrating that key spectroscopic properties unique to nanotubes and other carbon nanostructures make them ideal for biological detection, imaging, drug delivery, and cancer therapy via *in vivo* photothermal tumor destruction.

His use of single-walled carbon nanotubes as fluorophores to image mouse hind limb vasculatures in the second near-infrared region (NIR-II) is a feat unattainable by traditional NIR imaging or micro-CT. With the NIR-II's capacity of video-rate imaging with dynamic contrast and ability to quantitate blood flow in both normal and ischemic vessels, Dai has demonstrated the potential of NIR-II imaging for a wide range of biological structures and real-time processes, such as blood flow, vessel clotting, and angiogenesis.

Dai is the J.G. Jackson and C.J. Wood Professor of Chemistry at Stanford University. He earned his PhD degree in applied physics/physical chemistry from Harvard University in 1994. He is the Honorary Chair Professor of the National Taiwan University of Science and Technology (2015), a Fellow of the American Association for the Advancement of Sciences and the American Academy of Arts and Sciences, and serves on the editorial boards of eight publications. Dai has written more than 250 papers, and he is ranked as one of the most cited chemists (in materials chemistry) by Thomson Reuters.

Di Carlo named 2016 MRS Outstanding Young Investigator for microstructured materials

Dino Di Carlo, professor of bioengineering at the University of California–Los Angeles, has been named a 2016 Materials Research Society (MRS) Outstanding Young Investigator. He was cited "for pioneering methods to manufacture, measure, and manipulate microstructured materials and applying these innovations to biomedical problems." He will be presented with the award at the 2016 MRS Spring Meeting in Phoenix, Ariz.

Di Carlo has pioneered the use of inertia in microfluidic systems for controlling cell and particle motion. He has shown that inertia is not only critical to low Reynolds number flows in microchannels, but it is also extremely useful and easily exploited in these systems to achieve control over manipulation of bioparticles and cells, including positioning randomly distributed cells into a single-file stream, spreading cells out in ordered trains, or separating cells by size or deformability.

More recently, Di Carlo's research has used microfluidics and microfabrication techniques, especially inertial microfluidic techniques, to engineer novel materials to address various applications such as in wound healing, 3D advanced materials, tunable biomaterials, and shaped microfibers. Microfluidically fabricated microgel building blocks are the basis of a new microporous annealed particle scaffold technology that accelerates wound healing without growth factors in a cost-effective manner.

Di Carlo also led work to develop materials with strong embedded and patterned micromagnets for biomedical applications. Such micromagnetic arrays were used to manipulate magnetic nanoparticles within cells and apply forces to cells over large arrays. He discovered that force can bias the axis of cell division within cells using this platform, with implications for the early development of tissues as they morph and stretch. These arrayed micromagnets were also embedded into flexible materials to enable manipulation and magnetic actuation or cell separation on surfaces such as skin or centrifuge tubes.

Di Carlo received his BS degree in bioengineering from the University of California–Berkeley and received a PhD degree in bioengineering from the University of California–Berkeley and San Francisco. He then conducted postdoctoral studies from 2006 to 2008 at the Center for Engineering in Medicine at Harvard Medical School and Massachusetts General Hospital. He was awarded the National Science Foundation Faculty Early Career Development Award and the US Office of Naval Research Young Investigator Award in 2012, the Packard Fellowship for Science and Engineering and Defense Advanced Research Projects Agency Young Faculty Award in 2011, and received the National Institutes of Health Director's New Innovator Award and Coulter Translational Research Award in 2010.

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