Surgeons predict the future of nanomedicine in practice

March 1 2011

A new review published in *WIREs Nanomedicine and Nanobiotechnology* explores how nanotechnology may provide powerful new tools that could have a marked impact on the therapeutic and diagnostic measures available to surgeons.

Nanotechnology uses very small objects—billionths of a meter—to achieve tasks that would be difficult at larger scales. Nanodevices travel relatively freely throughout the body and can enter cells, making them useful for drug delivery, or mimic the features of the environment outside cells, making them useful for tissue engineering.

Their very properties can change as they become very small, allowing them to be triggered by external energy sources. Incorporation of nanoparticles into other materials can also change the latter's properties, making them stronger, or more flexible.

All of these properties can potentially be usefully harnessed by surgical practitioners to move their field forward. For example, review author Dr. Christopher Weldon MD, PhD of Children's Hospital Boston is developing everyday surgical implements enhanced by nanoscale features for improved performance and drug delivery. Review author Dr. Bozhi Tian, PhD, of Harvard Medical School and the Massachusetts Institute of Technology is developing an approach for integrating nanoscale digital electronics with engineered tissues. The goal of that project is to combine prosthetic devices and conventional engineered tissues at the cellular level, so that parallel diagnostics and tissue repair

can be achieved. He is also working on designing a 3D tissue scaffold with nanoscale surface patterns and electronically active nanoscale elements for stem cell differentiation. Review author Dr. Daniel S. Kohane, MD, PhD, of Children's Hospital Boston is developing a wide range of nanotechnology-based drug delivery devices that could be triggered by a patient or physician on demand.

Dr. Kohane notes that "Surgeons are effective gatekeepers in controlling access of technology to their patients. It is therefore important for surgeons to know what nanotechnology is and is not. The ability to assess the merits of nano-based approaches is crucial for the protection of the best interests of patients and for the assessment of the cost-effectiveness of new therapies."

Provided by Wiley

Citation: Surgeons predict the future of nanomedicine in practice (2011, March 1) retrieved 5 May 2024 from https://phys.org/news/2011-03-surgeons-future-nanomedicine.html