

Microscopic miracles

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Nanomedicines already bringing clinical benefits to thousands

"[Nanotechnology](#)" is a newly fashionable field but in the world of drug development it is certainly not new, Professor Ruth Duncan of the Welsh School of Pharmacy, Cardiff University has told the British Pharmaceutical Conference (September 27-29).

The first nanomedicines are already bringing clinical benefit to thousands of patients, said Professor Duncan in her Conference Science Chairman's address.

"Progress in the development of nano-sized hybrid therapeutics and nano-sized drug delivery systems over the last decade has been remarkable. A growing number of products have already secured regulatory authority approval and, in turn, are supported by a healthy clinical development pipeline. They include products used to treat multiple sclerosis, AIDS, cancer, hepatitis and arthritis."

Furthermore, the improved understanding of the molecular basis of disease has led to "real optimism that a new generation of improved medicines is just around the corner," Professor Duncan said.

New drugs and new delivery systems both come under the "nanomedicine" umbrella. Drug delivery systems are needed to exploit many of the drugs developed from advances in molecular biology. Professor Duncan said: "The challenge is to design innovative devices and technologies able to guide the therapeutic to its correct location of action and ensure that pharmacological activity is maintained for an

adequate duration once there."

Professor Duncan's research (funded by CRC, now Cancer Research UK) led to the transfer of the first polymer-based anticancer conjugates into clinical trial. She pointed out that polymer therapeutics -- which was unfashionable and considered an eccentricity in the 1970s and 80s -- had now generated promising compounds in many disease areas.

Looking to the future, Professor Duncan said that nanomedicine research is expected to bring significant advances in the diagnosis and treatment of disease.

She said: "This is still just the beginning. In the longer term, nanomedicines research will certainly embrace the opportunities arising from stem cell research, tissue engineering research and device miniaturisation. Real opportunities exist to design nano-sized bioresponsive systems able to diagnose and then deliver drugs (so-called theranostics), and to design systems able to promote tissue regeneration and repair (in disease, trauma, and during ageing) without the need for chemotherapy. These ideas may today seem science fiction, but to dismiss them too readily would be foolish. The risks and benefits must be carefully addressed to yield useful and safe technologies, but it has been accomplished before, and will be again."

Source: Cardiff University

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