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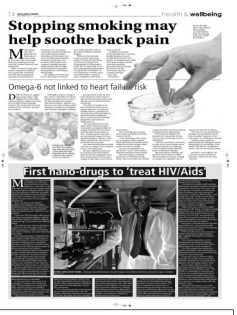
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First nano-drugs to 'treat HIV/Aids'

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MORE than 34 million people worldwide are suffering from the human immunodeficiency virus (HIV) with little sign yet of the disease being beaten or becoming less widespreadMore than 34 million people worldwide are suffering from the human immunodeficiency virus (HIV) with little sign yet of the disease being beaten or becoming less widespread.

Now, scientists in the United Kingdom are leading a 1.65 million pounds project to produce and test the first nanomedicines for treating HIV/Aids (acquired immune deficiency syndrome).

These new HIV therapies offer particular hope for treating children with the disease that affects 3.4 million children under the age of 15 years in sub-Saharan Africa.

About 90 per cent of infected infants acquire the virus through mother-to-child transmission. Without treatment, one third of children die within their first year of life.

The research project - funded by the UK's Engineering & Physical Sciences Research Council - at the University of Liverpool, England aims to produce cheaper, more effective medicines that have fewer side-effects and are easier to give to newborns and children.

The new therapy options were generated by modifying existing treatments for HIV, called anti-retrovirals (ARVs).

Liverpool University has recently produced ARV drug particles at the nanoscale that potentially reduce the toxicity and variability in the response that different patients have to therapies.

Drug nanoparticles have been shown to allow smaller doses in other disease areas; this opens possibilities to reduce drug side-effects and the risk of drug resistance. Nanoscale objects are less than one micron in size; a human hair is about 80 microns in diameter.

At the university's Department of Chemistry, Professor Steve Rannard said: "Nanomedicines are being used daily to treat a range of conditions around the world. There are no current nanoparticle HIV therapies that are providing this kind of patient benefit.

"This project is the first step towards taking the nanomedicine options that we have developed out of our labs and into the clinic, representing a significant milestone in the development of new HIV treatments.

"If we can demonstrate real potential from our planned clinical work with healthy volunteers at the Royal Liverpool University Hospital, then our collaboration partner, IOTA NanoSolutions, will take forward the further development and clinical validation of the ARV drug particles in HIV patients. We also aim to test new formulations for children in developing countries, offering HIV patients around the world the prospect of safer, more effective treatments," added Professor Rannard.

At the university's Department of Molecular & Clinical Pharmacology, Professor Andrew Owen added: "We have integrated an assessment of pharmacology and safety early in the research and this has allowed us to rapidly progress leading options for clinical trials. The work has been conducted with the Medical Research Council Centre for Drug Safety Science also based at the university.

"Our data so far looks really exciting, offering the potential to reduce the doses required to control the HIV virus. This work builds on initiatives by Médecins Sans Frontières and other groups to seek ways to improve ARV therapy - and could have real benefits for the safety of ARVs globally. Importantly, we also hope to reduce the costs of therapy for resource-limited countries where the burden of disease is highest."

Today, there are very limited child-appropriate HIV drugs available; existing treatments carry a range of risks for the infant including under dosing or over dosing. The new HIV nanomedicines from the Liverpool team disperse into water, making them easier to administer, particularly to newborn babies.

The project will manufacture the ARV nanomedicines using commercially relevant techniques under clinical grade manufacturing conditions.

IOTA NanoSolutions was created to further develop and exploit technology originally developed at Liverpool University.

The company operates a novel nanoparticle synthesis technology, ContraSol, and is working with major global pharmaceutical companies.

The ARV programme represents a further extension to the continuing collaboration between Liverpool University and IOTA NanoSolutions.

The project aims to deliver highly valuable data within three years and provide a platform for continual development and testing during that time.

David Delpy, chief executive of the Engineering & Physical Sciences Research Council (EPSRC), said: "The EPSRC is continuing its strong investment in nano-related research which now permeates through almost every aspect of the engineering and physical sciences. This research may bring significant benefits to children infected with the HIV virus."

Liverpool University is one of the UK's leading research institutions with an annual turnover of 410m pounds, including 150m for research; it is ranked in the top one percent of higher education institutions worldwide. - LPS

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BETTER, SMALLER HIV DOSES... Professor Steve Rannard aims to make cheaper, more effective medicines and easier to give to children. PHOTO: LPS