Targeted drug delivery could transform therapies

May 21 2015, by Robert Beahan

A world expert in biomedical engineering will today argue that medical science has been focusing on the wrong problem for 30 years. Instead of inventing new drugs, making better use of the drugs we already have available by targeting them to the affected part of the body could hold the answer to tackling many of today's life threatening diseases.

Professor Eleanor Stride, winner of the Institution of Engineering and Technology's A F Harvey Engineering Research Prize will deliver a lecture on her team's pioneering work. She will explain how her research aims to revolutionise the treatment of major diseases by making drugs currently on the market work more effectively. This involves encasing drugs in ultrasound activated "bubbles" to increase the amount of drug delivered to a target site while diminishing unpleasant and dangerous side effects, such as nausea, hair loss and risk of infection.

The drug loaded bubbles are injected into the blood stream so that the drug can be released at a particular part of the body 'on-demand' by exposing it to ultrasound from outside the body.

Professor Stride from the University of Oxford has been awarded the £300,000 IET A F Harvey Engineering Research Prize due to her outstanding contributions to biomedical engineering and her research into the treatment of major diseases. The prize money will be used to further her research in particular developing new techniques for fabricating bubbles with a very high degree of control.

Professor Stride said: "We are still at a very early stage but our recent results suggest that we can vastly improve the way we deliver existing drugs – and that this could be far more effective in the long run than inventing new cures. Currently, when drugs are injected, for example in the treatment of cancer or stroke, only a tiny percentage actually reaches the site of the disease. The rest of the drug will affect healthy tissue and can lead to extremely unpleasant side effects. If we can maximise the amount of drug in the target area we can both drastically improve their efficacy – and reduce these side effects.

"The sense of achievement if we can get this working in the clinic and helping patients would be fantastic, and having our work recognised by the IET A F Harvey Prize is a great honour. We are tremendously excited by the recent discoveries our team has made in fabricating microparticles that can be activated by ultrasound for controlled drug release – and the prize will enable us to develop this research into usable technology that can improve delivery of conditions such as cancer and stroke."

Sir John O'Reilly, Chair of the IET's Selection Committee for the Prize, said: "Professor Stride's research in drug delivery and biomedical ultrasonics is an excellent example of the innovation that can be achieved from the cross-fertilisation of engineering and biomedical sciences.

"Targeted drug delivery is a 'hot topic' for contemporary research, as it has the potential to significantly improve treatment for many life-threatening diseases, particularly cancer. Prof Stride's ongoing research is likely to have huge societal benefits and important implications for society and the healthcare industry."

This story is published courtesy of Electronics Letters. *For additional Electronics Letters news and features visit* theiet.org/eletters.

Provided by Institution of Engineering and Technology