For immediate release

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**Microspheres - antibiotic carriers for the direct delivery of drugs to wound sites**

**Biodegradable microspheres are ideal drug carriers for antibiotics and for their direct application to sites of musculo-skeletal surgery. Understanding drug carrier formation and drug release efficiency is of paramount importance in optimising the design of drug delivery mechanisms.**

Stringent sterilisation and aseptical environments are required during surgery to prevent microbial infection of the wound. Correct identification of pathogens allows the effective prevention and treatment of infection through the administration of appropriate antibiotics. Antibiotics such as fusidic acid (FA) are highly effective against *Staphylococci*, which commonly cause prosthetic joint infections.

Systemic delivery (indirectly to the site of treatment via blood stream or digestive system) of FA risks complications including the lack of blood vessels in some wound areas, as well as systemic side effects such as nausea and stomach pain. Research has shown that direct application of antibiotics to surgical sites offers significant advantages over systemic delivery; not only can higher tissue concentration levels and prolonged drug delivery be achieved, systemic side effects can simultaneously be avoided.

inVia StreamLine Plus™ Raman imaging was used to characterise FA-loaded microspheres constructed of different matrix materials – poly(DL-lactic-co-glycolic acid) (PLGA), poly(L-lactic acid) (PLLA) and poly (3-hydroxybutyric acid-co-3-hydroxyvaleric acid) (PHBV), to gain an understanding of the drug delivery mechanism.

The Raman images show the FA micro-domains in microspheres of the selected materials. Further investigation on the drug release efficacy of these microspheres will provide information for optimising the design of drug vehicles.

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**Figure** - inVia StreamLine Plus™ Raman images show that whilst FA is confined in the micro domains, ubiquitous distribution of the microsphere polymer material was detected.

For further information on Raman Spectroscopy visit [www.renishaw.com/raman](http://www.renishaw.com/raman)

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