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New laser technique promises better process control in the pharmaceutical industry

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Scientists at the Science and Technology Facilities Council (STFC) Rutherford Appleton Laboratory in Oxfordshire, UK have developed an effective laser based method for the characterisation of the bulk chemical content of pharmaceutical capsules - without opening the capsules!

In close collaboration with teams from Pfizer Ltd, a leading pharmaceutical company, the researchers in STFC's Lasers for Science Facility succeeded in quantifying the presence of the active pharmaceutical ingredient in production line relevant capsules to a relative error of 1%. Other established non-invasive methods were unable to reach the same level of accuracy with the same sample.

The technique holds great potential for a range of process control applications in the pharmaceutical industry. The results of the collaborative study are reported in the Journal of Pharmaceutical and Biomedical Analysis.

The development stems from research into a novel Raman spectroscopy method, Spatially Offset Raman Spectroscopy, which is under development at STFC for a wide range of applications including the detection of explosives in non-metallic containers, the detection of counterfeit drugs through opaque packaging and the non-invasive diagnosis of bone disease and cancer. The concepts, which are relatively simple to implement, were developed through experiments involving STFC's large scale facilities which provided crucial insight into photon

transport processes.

The development is being carried out in close collaboration with STFC's knowledge technology transfer arm [CLIK] and the new techniques are planned for commercialisation through STFC's spin-out company LiteThru Ltd.

"This work is a great example of how leading edge science performed on national scale facilities can be directly translated into solutions for key industrial problems. Direct collaboration between Pfizer and STFC scientists is a model for the future, allowing leading-edge techniques to be appropriately targeted to the benefit of the UK economy", says Professor Mike Dunne, Director of the Central Laser Facility of which the Lasers for Science Facility is an integral part.

Professor Pavel Matousek, the project leader commented, "I am delighted that the vibrant environment at STFC enables us to engage in world-leading science and to make effective use of new ideas and discoveries for the direct benefit of our society."

Source: Science and Technology Facilities Council

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