

Sugar boost for Oxfordshire scientists who are planning ahead for future medicines

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Scientists continuing to investigate a 50 year mystery have discovered another vital clue that could help pave the way for improved medicines. The results feature in a special edition of *Nature* celebrating the International Year of Chemistry. The findings reveal an important insight into the way carbohydrates (sugars) bond and this will influence the way drugs are designed in the future.

Using specialist laser equipment from the EPSRC-funded Laser Loan Pool managed by STFC's Central Laser Facility, Professors John Simons and Ben Davis together with co-workers from the University of Oxford, have challenged long standing theories that have until now, been based on observations and experiments made in solution. For the first time, the shapes of carbohydrates have been revealed, both when they are free from any external influence, and when they are interacting with neighbouring molecules, such as water, or [protein fragments](#). This enables the two states to be compared. These experiments have demonstrated what happens to the sugars when they are manipulated in different ways - a crucial factor in drug design where scientists need to ensure they will be able to control the way drugs work within the body.

The sugar, was examined by computational chemistry and pulsed [laser spectroscopy](#) using an [ultraviolet laser](#) borrowed from the Laser Loan Pool. The new results, exploring sugar-protein interactions, provide the best insight so far into these crucial biological contacts.

Professor Simons said; "This breakthrough opens up a whole realm of

possibilities for the way we can use this information to inform future drug development. If we can understand the structural consequences of [carbohydrate protein binding](#) we can work out how sugars might be manipulated to function at their most effective within drug development and delivery work".

Dr Ian Clark who runs the Laser Loan Pool said; "This is just one example of the huge variety of work we are able to support. This year is the 25th anniversary of the Loan Pool and over that time the Pool has loaned out lasers for everything from investigations into the oxygen content of blood to the study of sound propagation from sonic booms. In total we have given out close to 400 lasers.

Provided by Science and Technology Facilities Council

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