Structure of insulin's docking point identified

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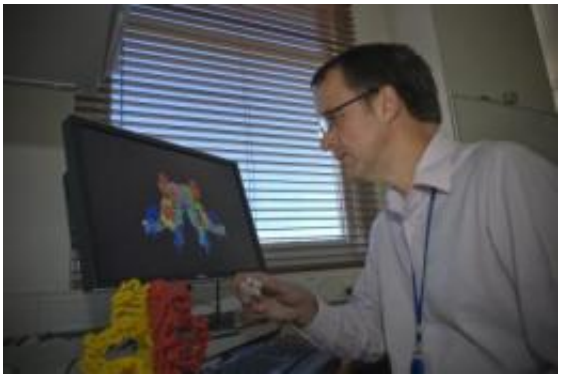

Dr Mike Lawrence from the Walter and Eliza Hall Institute has determined the structure of a previously unseen part of the insulin receptor, making possible new treatments for diabetes. Credit: Walter and Eliza Hall Institute

Walter and Eliza Hall Institute scientists have determined the structure of a previously unseen part of the insulin receptor, making possible new treatments for diabetes.

The insulin receptor is a large protein on the surface of cells to which the hormone insulin binds. Insulin controls when and how glucose is used in the human body. Understanding how insulin interacts with the insulin receptor is crucial to the development of treatments for diabetes.

Australian scientists revealed the structure of the major part of the insulin receptor in 2006 but the structure of a key segment to which

insulin binds remained elusive. Now, Drs Mike Lawrence, Brian Smith, John Menting, Geoffrey Kong and Colin Ward from the institute's Structural Biology division, together with colleagues from the Case Western Reserve University and the University of Chicago, have worked out the molecular structure of this previously unseen region.

Their findings have been published today in the Proceedings of the National Academy of Sciences USA early edition.

Dr Lawrence said scientists had been trying for decades to work out how insulin interacts with the insulin receptor. "You can't work it out unless you have a view of the site to which the insulin binds, and that's what we've done," he said.

"By understanding how insulin binds and transmits messages into the cell we will be in a better position to design compounds that mimic insulin and could be used to treat diabetes."

As well as determining the three-dimensional structure of the insulin receptor, the team is also trying to work out the structure of the related Type 1 insulin-like growth factor receptor, to which insulin-like growth factors bind.

"These structures are not currently known, despite their considerable importance and direct relevance to the design of new drugs for cancer, Alzheimer's disease and diabetes - three of the most critical diseases facing Australia," Dr Lawrence said.

Provided by Walter and Eliza Hall Institute