Structural biology spin-out tackles major diseases

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A spin out company from basic structural biology, Asterion Ltd., has led to new technology that provides a way of creating therapeutic proteins to tackle major diseases such as cancer, diabetes and infertility. The research was carried out at the University of Sheffield in laboratories supported by the Biotechnology and Biological Sciences Research Council (BBSRC). This work is reported in the current edition of *BBSRC Business,* the quarterly research highlights magazine of the Biotechnology and Biological Sciences Research Council.

Professor Richard Ross, Chief Scientific Officer of Asterion Ltd., said: "A big challenge for biological therapeutics is that they are broken down rapidly in the body. The technology developed by Asterion Ltd. is based on basic structural biology work that has provided us with the knowledge necessary to develop longer acting drugs. This is a major advantage for patients, as it means monthly injections rather than daily injections."

Professor Ross, along with fellow founding directors Professors Pete Artymiuk and Jon Sayers have shown that it is possible to engineer proteins that can intervene when there is a deficiency in hormones. Their initial experiments involved fusing different elements of hormone and receptor in order to treat a growth disorders such as short stature (a deficiency in growth hormone).

Professor Ross continued: "Our patented and versatile therapeutic platform technology ProFuse TM, could also tackle major diseases such as some cancers, anaemia, infertility and diabetes. Under normal

circumstances hormones of the type known as cytokine hormones - growth hormone for example - circulate in the blood and are bound to proteins that prevent them from being degraded. The basic structural biology work we have done in the past means that we can see the interaction between the hormone and the binding protein in exquisite detail. Our understanding of this structural information means that we can rationally design drugs that consist of this pairing of hormone and binding protein that still allows them to activate the cell surface receptor. In this situation, the hormone portion of the drug is better protected in the circulation from degradation and so it has a much longer effective life in the body."

This system of drug design has been developed by Asterion Ltd. into a patented and versatile therapeutic platform technology called ProFuse™. Using this technology it will be possible to make other useful pairings between therapeutic hormones and protective receptor domains (the binding proteins) that could be used to tackle major diseases such as some cancers, anaemia, infertility and diabetes.

Source: Biotechnology and Biological Sciences Research Council