

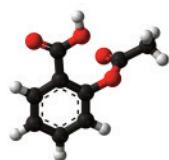
Window on the Science

Proteins in medicine

A revolution in medicine is well underway, underpinned by the desire for a deeper understanding of the basis of disease beyond that of classical pathology. Determining what is happening at the molecular level can guide treatment of diseases with precision. At its core, this is about proteins. The value of proteomics technology has made it a cornerstone tool to help understand the dynamics of disease in the ever-changing environment that is the living body.

Proteins are giant, complex biological molecules that carry out all the functions within living systems. They have precise modes of action in the human body. Protein drugs, termed *biopharmaceuticals*, can provide highly complex functions that simple chemicals cannot perform and moreover, are less likely to cause adverse effects.

Drug developments - comparison of size and complexity



21 atoms

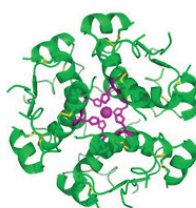
Aspirin

analgesic first derived from tree bark.

180 atomic mass units



Penny Farthing
20kg



723 atoms

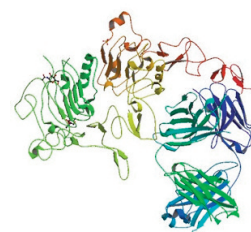
Insulin

peptide used in diabetes management.

5,808 atomic mass units
32 x aspirin



Mini Cooper
650kg



25,000 atoms

Herceptin®

engineered Monoclonal Antibody used for treating breast cancer and chronic kidney failure.

150,000 atomic mass units
850 x aspirin • 26 x insulin



F18 Jet Fighter
17,000kg

The use of *biopharmaceuticals* is now firmly established with over 20% of the overall drug market and numerous illnesses are currently being treated with protein based drugs. It is predictable that such drugs will soon dominate the pharmaceutical industry with some commentators suggesting that these protein drugs are one of the most elegant achievements of modern science¹.

One reason for this growth is the critical role of proteins at the centre of life. PILL's core business is proteins and the company is taking a central role in these developments by looking closely at the molecular basis of disease conditions and the proteins that the body makes. From this comes possible new drug targets and new diagnostic biomarkers.

These new biomarkers offer a more precise approach to diagnosis and could lead to great improvements in human health. PromarkerD is potentially a defining step in the early detection of diabetic kidney disease. The development of the intellectual property underpinning this test is a major achievement for PILL and establishes a platform that can lead to markers for other diseases.

1. <http://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/rapid-growth-in-biopharma>