

‘Designer molecules’ being developed to fight disease

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(PhysOrg.com) -- Researchers in the Department of Cardiovascular Sciences at the University of Leicester are developing a new way to make protein based drugs with potential applications in stroke, vascular inflammation, blood vessel formation, regenerative medicine and tissue engineering.

The research carried out by doctoral student Shikha Sharma in Dr Nick Brindle’s group in Department of Cardiovascular Sciences aims to allow researchers to rapidly make ‘designer proteins’ that can bind to disease causing molecules in the body.

Shikha Sharma said “There are millions of different proteins that are involved in carrying out numerous functions in the human body. Over time each protein has evolved to optimise its function. Disease could result if any of these fail to perform efficiently.”

“By generating designer proteins in test tubes, we can produce molecules that have specific actions to control processes in the body. These proteins can be used to make drugs as a treatment for heart disease and cancer.”

She said: “Whilst most drugs in current use are synthetic, these designer molecules are developed from natural proteins and are likely to have fewer side effects. Proteins perform a well defined but complex set of function in the body and protein therapeutic drugs can perform better when compared to some synthetic small molecule drugs that may have

unwanted interactions within the body.”

“Current methods to generate protein therapeutic are cumbersome and time consuming. At the University of Leicester, we have developed a novel method to revolutionise the way in which we produce these designer protein drugs. In principle this method mimics natural evolution to make new proteins but over a shorter timescale. Instead of taking millions of years, we can create new proteins in just a few weeks.”

She said: “The fact that this new method utilizes a similar mechanism by which antibodies are generated, suggests the output from this method will be as robust and dynamic as the wide range of antibodies produced in our bodies to fight the rapidly evolving viruses in the environment.”

Dr Brindle said: “Shikha has made great progress towards this new method, which holds the promise of new better drugs for a wide range of human and animal disease.”

In addition to medicine, the method holds promise for a wide range of applications in the chemical, pharmaceutical, and agricultural industries, such as generating protein molecules to prevent uptake of toxins in crops or [protein](#) molecules for detection of environmental pollutants.

Source: University of Leicester ([news](#) : [web](#))

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