

# New enzyme research targets osteoporosis

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A University of Queensland biophysical chemist is working on new research which one day may slow down or switch off certain diseases.

Dr Gary Schenk from the School of Molecular and Microbial Sciences has been awarded an \$85,000 UQ Research Excellence Award to study a group of enzymes including one linked to osteoporosis, a damaging bone disease.

“An enzyme works like a machine, you feed in a substrate (a particular molecule), the enzyme does something to it and out comes a product,” Dr Schenk said.

“If you're able to inhibit this enzyme's action, you can in effect combat the disease associated with it.”

Understanding how an enzyme works during a reaction is a key to its use as a drug target, with the mid-point of the process (known as the transition state) of particular interest.

“The problem with transition states is that they are very unstable and difficult to study,” Dr Schenk said.

“One way we can investigate the ‘shape’ of this state is by using isotopes – atomic markers which are placed at particular positions in the substrate.

”This modified molecule may have chemical properties different from

those of the original, an observation which can be used to ‘visualise’ the transition state,” he said.

From this information synthetic molecules can be designed which mimic the real thing and may be able to stop the reaction taking place.

Dr Schenk will use the award to visit a laboratory at Utah State University, where he will collaborate with Professor Alvan Hengge, a world leader in the field.

Although in its early stages, Dr Schenk said that the project could lead to a range of breakthroughs including the creation of the next generation of antibiotics and agricultural products.

“The 1990s was the decade of genomics, cloning and sequencing. Now it's important to realise the potential enzymes have to advance research in my area and others.

“Not just understanding how enzymes work but utilising them as targets for the development of pharmaceuticals is likely to be a major research direction in Australia and the rest of the world.”

Source: UQ

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