

The World Health Organization reports that obesity has reached epidemic proportions globally with more than 1 billion overweight adults of which at least 300 million are obese.

This has left doctors and politicians scratching their heads and wondering what to do about a disease that threatens lives and costs the United States billions of dollars in health care each year.

Now that it looks like diet and exercise alone may not be enough to combat the problem, scientists like Susanne Striegler, an organic chemist in the department of chemistry and biochemistry, are stepping with the goal of developing functional enzyme mimics which could be used to synthesize new pharmaceuticals that trick the body and do not allow to digest complex sugars.

"The development of functional enzyme mimics is of great interest and some remarkable achievements have been made recently, but the mimicking of sugar-transforming enzymes by chemical models is a difficult task and achievements in this area are still pending," she said.

Dr. Striegler's research efforts are focused on the design of advanced materials based on molecular recognition between immobilized metal complexes and biomolecules, concentrating on the development of polymer-based materials for sensing purposes and catalytic transformations of underivatized carbohydrates and glycosides.

"I am most interested in catalysts that allow reactions on biomolecules that nature cannot do," she said.

"Functional enzyme models are roughly defined as structures that mimic the two properties of enzymes: high activity and high selectivity. Both functions need to be mimicked and combined," Dr. Striegler said.

"The combination is the challenge," she said. "To overcome low activity for catalysts in water and make them highly selective, we use metal complexes as a core of an enzyme mimic because metal complexes are known to transform. On the other hand, most of these metal complexes are not very selective. To achieve that, we want to create a templated surrounding around the complex.

Templating is like putting a key inside chewing gum so that it leaves an imprint of the key after removal of the template."

Dr. Striegler hopes to create highly selective catalysts that target one sugar type only.

"That's when we start to make an enzyme mimic by taking principles out of nature and creating reactions that nature cannot do. A mimic that can be used for creating new food additives and food fillers as a substitute for table sugar by unnatural sugars would be very valuable. Easy access to unnatural sugars that cannot be digested in the body would open a new way to battling obesity," she said.



Enzyme Mimics Target Obesity

By: Martha Barker