Obesity Treatment from Biological Factors

Technology #m03-005

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Obesity Prevention:
Obesity is a growing health issue worldwide. In the US, 30% of the adult population is considered obese, while another 35% is considered overweight. Obesity leads to an increased risk of type 2 diabetes, cardiovascular disease, and a host of other health issues. While the American diet in combination with a lack of physical exercise contributes much to this growing epidemic, biological factors are also at work. Therefore, there is an ongoing search for therapeutic agents that may help control the spread of this major health problem.

ACC inhibitors have been in use as herbicides for more than 30 years. Development of new herbicides as well as fungicides and insecticides for agricultural applications would be highly desirable.

Obesity Drug Design from Crystal Structure:
Acetyl-coenzyme A carboxylases (ACCs) are crucial for fatty acid metabolism, and are promising targets for drug development against obesity, diabetes, and other diseases. ACC inhibitors are in use as herbicides for agriculture, demonstrating proof of principle that small molecules can regulate the activity of this enzyme.

This technology presents a crystal structure of the carboxyltransferase (CT) domain of ACC, defining the structure of the active site. The technology also presents a method for producing large amounts of the CT domain and for producing good-quality crystals of this domain. Targeted drug design is now feasible using the details found in this crystal structure. The crystals can also be used to elucidate the molecular mechanism of action for new inhibitors, and the purified CT domain can be used in primary and/or secondary assays to confirm the activity of known inhibitors.

Applications:
Finding inhibitors of acetyl-CoA carboxylase for use in the following applications:
• Obesity
• Type 2 diabetes
• Cardiovascular diseases • Cancer • Herbicides/fungicides/insecticides

Advantages:
• Enables rapid screening for drugs against obesity and type 2 diabetes
• Enables design of ACC inhibitors
• Enables fast identification of herbicides/insecticides/fungicides
• Enables elucidation of molecular mechanism of action of known inhibitors
Patent Status: Patent Application has been allowed (US20050009163A1) ~ see link below.

Licensing Status: Available for Licensing

Publications:


Inventors

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