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Novel Therapeutic Agonists for the Nuclear Hormone Receptor FXR

INVENTION: FXR is a nuclear hormone receptor that is activated by bile acids, which are produced by the body in response to consumption of food to initiate the digestion process in the intestine. Salk investigators have discovered and developed small molecule compounds that are agonists of FXR, which in turn act like an imaginary meal and trick the body into reacting as if it has consumed calories, thus initiating the burning of fat cells.

APPLICATIONS: The FXR agonists could be used to treat the following:

- Obesity
- Type 2 diabetes
- metabolic syndrome
- gastrointestinal cancer

ADVANTAGES:

- Activity is restricted to the intestine when the FXR agonists are administered orally, minimizing the probability of side effects.
- Oral administration is ideal for patient compliance.

STAGE OF DEVELOPMENT: Mouse models for obesity and diabetes that were treated with the FXR agonists showed lowered glucose and improved insulin levels, as well as weight loss. These compounds also increased the thermogenic response, causing the mice to lose weight by burning through stored brown fat to convert into body heat.

BACKGROUND: As soon as you begin eating a meal, your body begins to process that food. The process begins in the intestine with the release of a substance called bile acids, which are released in the intestine to aid the body's absorption of nutrients. The bigger the meal, the more bile acid that is produced and the more the receptor sensor is stimulated.

LEAD INVENTORS: Ronald M. Evans and Michael Downes

PATENT STATUS:
International applications are pending for WO 2015/138968A1 (AU, CA, JP, KR)
International applications are pending for WO 2015/138985A1 (EU, AU, CA, JP, KR)
Issued U.S. patents 7,671,085; 7,647,217; and 8,212,006

PUBLICATIONS:
http://www.salk.edu/news-release/imaginary-meal-tricks-the-body-into-losing-weight/
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