New approach to isolation and improved design of adipose cell-targeted cytotoxic peptides

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Technology description

METHODS AND COMPOSITIONS FOR TARGETING ADIPOSE TISSUE IN MAMMALS

Background and Market

Obesity, caused by overgrowth of white adipose (fat) tissue, is a risk and complicating factor for cardiovascular diseases, Type 2 diabetes, certain types of cancer, and may other pathologies. No effective pharmaceutical treatments against obesity are currently available.

Competitors and Current Problems

Obesity is caused by expansion of white adipose tissue. This process relies on proliferation of adult stem cells, termed adipose stromal cells (ASCs). These cells, abundant in adipose tissue, can be readily harvested for use in regenerative therapies and hundreds of clinical trials are now underway. The lack of markers for adult stem cells, including ASC, has been limiting in the clinical context because it has made it difficult to track them upon administration. While being potentially clinically useful, ASC appear to be at least partially responsible for the link between obesity and disease and thus pose a prospective therapy target. For these separate reasons, identification of ASC markers is essential for their identification and targeting. New approaches to controlled ACS depletion is the logical next step in an obesity therapy development.

The Technology: Researchers at UTHealth have identified a marker expressed uniquely on ASC surface. They also isolated a number of peptide sequences targeting only ASCs and not stromal cells in other organs by binding to this marker. The method the research team developed relies on billions of viral particles each displaying a different peptide on its outer coat. The new findings show it is possible to direct probes to stem cells in vivo in an organ-specific manner. In the future, the identified cell surface biomarker may be exploited for imaging or therapeutic ASC targeting. The ASC-specific peptide probes may be developed into directed cytotoxic compounds to aid in diagnosis, prevention, and/or targeted treatment of adipose associated disorders such as, but not limited to, body composition disorders, metabolic syndrome, and cancer. Other peptides isolated by the UTHealth researchers, based on their homing to lung, muscle, and bone marrow stromal cells, set the foundation for subsequent identification of probes specific for stem cells of these organs.

Institution

University of Texas Health Science Center Houston

Inventors

Mikhail Kolonin