

27th European Diabetes Congress

June 20-21, 2018 | Rome, Italy

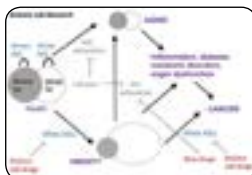


Mikhail G Kolonin

University of Texas, USA

Controlling adipose tissue metabolism by targeting white and brown preadipocytes

Changes in the relative abundance of thermogenic beige adipocytes and lipid-storing white adipocytes in adipose tissue underlie the progression of obesity and metabolic disease. We have discovered that mouse and human adipose tissue contains distinct beige and white adipocyte progenitor populations marked by PDGFR α or PDGFR β expression, respectively. Our recent report suggests that adipocyte lineage specification and metabolism can be modulated through PDGFR signaling. We have also developed hunter-killer peptides, composed of a cell surface receptor-binding domain and a pro-apoptotic domain, for targeted ablation of cells in adipose tissue. A hunter-killer peptide D-WAT, targeting PDGFR β + white adipocyte progenitors, suppresses high fat diet-induced obesity development and enabled maintenance of active metabolism. Another compound, adipotide, targeting endothelial cells and adipocytes in white fat, reverses obesity in several animal models and has shown promise in a clinical trial. In unpublished studies, we have developed a hunter-killer compound D-BAT, based on a peptide that targets brown fat tissue, which may relieve hypermetabolic conditions. New experimental approaches to fat tissue composition and function control will be discussed.



Recent Publications

1. Gao Z, *et al.* (2018) PDGFR α /PDGFR β signaling balance modulates progenitor cell differentiation into white and beige adipocytes. *Development* 145:1-13.
2. Daquinag A C, *et al.* (2011) An isoform of decorin is a resistin receptor on the surface of adipose progenitor cells. *Cell Stem Cell* 9:74-86.
3. Daquinag A C, *et al.* (2017) Non-glycanated decorin is a drug target on human adipose stromal cells. *Molecular Therapy* 6:1-9.
4. Daquinag A C, *et al.* (2016) Targeted pro-apoptotic peptides depleting adipose stromal cells inhibit tumor growth. *Mol. Ther.* 1:34-40.
5. Daquinag A C, *et al.* (2015) Depletion of white adipocyte progenitors induces beige adipocyte differentiation and suppresses obesity development. *Cell Death & Diff.* 22:351-363.

Biography

Mikhail G Kolonin is an Associate Professor and Director of the Center for Metabolic and Degenerative Diseases at the University of Texas in Houston. As a PhD from Wayne State University, he pioneered the concept of expressing peptides disrupting protein interactions in animals. As a Postdoctoral fellow at MD Anderson Cancer Center, he screened combinatorial libraries to identify druggable cell surface markers. Based on this approach, he has invented experimental therapeutics for obesity and cancer. He is an Author of over 60 publications, and has editorial positions with *Molecular Carcinogenesis and Cancer Research*. He is endowed with a Distinguished University Chair in Metabolic Disease Research.

mikhail.g.kolonin@uth.tmc.edu