

Adipocyte-Targeted Gene Therapy via Dual FABP4/FABP5 Fat Accumulation Factor Silencing



METABOLIC	Candidate
Product Type	Non-viral Gene Therapy
Indication	The primary indication for this product is obesity, with a focus on treating obesity-induced metabolic disorders such as type 2 diabetes, insulin resistance, non-alcoholic fatty liver disease (NAFLD), and chronic inflammation-related conditions.
Target	The primary targets of this therapy are FABP4 (Fatty Acid Binding Protein 4) and FABP5 (Fatty Acid Binding Protein 5), which are intracellular lipid chaperones.
MoA (Mechanism of Action)	<p>The drug is a short hairpin RNA (shRNA)-based therapy targeting FABP4 and FABP5, key lipid chaperones in adipocytes responsible for fatty acid uptake and storage. The shRNA silences the mRNA of FABP4 and FABP5 through RNA interference, effectively reducing lipid accumulation and adipose tissue mass.</p> <p>To ensure adipocyte-specific action, the therapy incorporates ATS-9R, a fusion peptide combining an adipocyte-targeting sequence (ATS) and 9-arginine (9R). ATS binds selectively to prohibitin, a protein overexpressed on the surface of mature adipocytes, enabling precise delivery of the therapeutic cargo into adipocytes.</p>
Competitiveness	<p>This therapy is first-in-class, directly targeting adipocytes via FABP4/5 silencing, ensuring specificity and minimal off-target effects.</p> <p>Unlike GLP-1 receptor agonists (GLP-1RAs), which act on the brain to suppress appetite and often cause systemic side effects such as nausea, vomiting, and cardiovascular risks, this therapy addresses the root cause of obesity by directly modulating adipocyte lipid metabolism.</p> <p>With precise adipocyte targeting through ATS-9R, it offers superior safety, avoids systemic complications, and achieves sustained metabolic benefits, positioning it as a potential best-in-class solution.</p>
Development Stage	Lead
Route of Administration	Injectable, Transdermal (Microneedle Patch), Oral