Docket #: S22-279

Extracellular CES2 Proteins for the Treatment of Metabolic Disease

Stanford researchers have identified exercise-inducible, carboxylesterase 2 (CES2) proteins, which suppress obesity in high fat diet-fed mouse models. Generally, CES2 proteins are intracellular and localized to the endoplasmic reticulum. But Stanford researchers have engineered soluble (e.g., extracellular) CES2 proteins. These soluble CES2 proteins exhibit complete extracellular localization and anti-obesity and anti-diabetic effects when overexpressed in mice. These recombinant CES2 proteins can be used as biological therapeutics for obese individuals.

Stage of Development
Proof of concept: in vivo studies in mouse successfully completed

Applications

- Obesity
- Obesity-associated cardiometabolic disease

Advantages

- Delivery as recombinant proteins

Publications

- Wei Wei, Nicholas M. Riley, Xuchao Lyu, Xiaotao Shen, Jing Guo, Steffen H. Raun, Meng Zhao, Maria Dolores Moya-Garzon, Himanish Basu, Alan Sheng-Hwa Tung, Veronica L. Li, Wentao Huang, Amanda L. Wiggenhorn, Katrin J. Svensson, Michael P. Snyder, Carolyn R. Bertozzi, Jonathan Z. Long, "Organism-wide, cell-

type-specific secretome mapping of exercise training in mice." *Cell Metab*. 2023, 35(7) : 1261-1279. (Online 3 May 2023)

Patents

- Published Application: WO2024020302
- Published Application: 20260021165

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