King Faisal
PRIZE

Obesity: A New Age Epidemic

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Abstract

from desire, through disdain, to therapy

Obesity, stigmatized in recent decades as a failure of willpower which was a stark contradiction to previous praise, signifying it as evidence of prominent socioeconomical status, and even as a coveted sign of beauty in some cultures, has lately been redefined as a complex chronic neuroendocrine and metabolic disease effecting millions around the world [1,2,3]. Although obesity has long been recognized as a chronic disease, treatment options were historically limited by the lack of effective pharmacotherapy, and several available agents were withdrawn because of safety concerns and unfavorable adverse-effect profiles. Consequently, management relied primarily on lifestyle interventions, including dietary modification and physical activity, with bariatric surgery considered in more severe cases. A major therapeutic breakthrough emerged with the work of Svetlana Mojsov on glucagon-like peptide-1 (GLP-1) (7-37), which laid the scientific foundation for effective pharmacologic therapies for obesity. This contribution was recognized with the 2026 King Faisal Prize in Medicine, awarded for "Discoveries Transforming Obesity Therapeutics" [2,3,4,5,6].

Introduction:

A global push to Cure

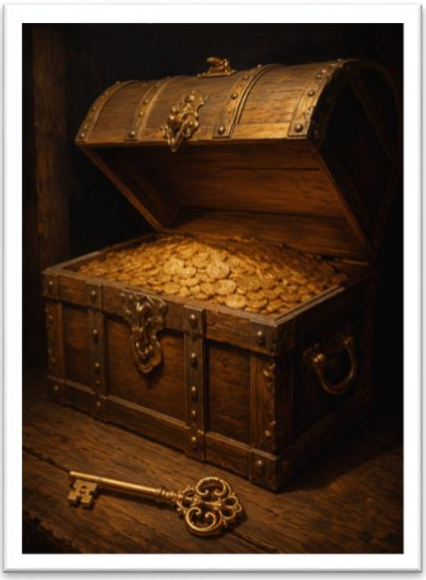
In 1997 the World Health Organization (WHO) recognized obesity as an epidemic, thus ushering in tremendous desire and effort by the scientific and global community to resolve it. If not for its dire impact on human health worldwide, then for the excessive cost of care associated with managing it and its associated health issues, which has been estimated to exceed $4 trillion by 2035 [1,5,7].

The prevalence of obesity worldwide is alarming, over 42% of the world adult population were categorized with obesity in 2023, and almost 15% for adolescents [1,3,7,8]. Obesity prevalence in Saudi Arabia exceeds 23% in adults and is approximately 14% in adolescents [9,10], while the corresponding estimates in the United States are higher at 40.3% and 27%, respectively [7,8]. These staggering figures mandated tremendous efforts by governments worldwide to fight obesity, especially in light of its serious complication rates: 30-53% type 2 diabetes, 50-60% cardiovascular disease, and 4-8% cancer [3,5,10,11].

The road to obesity drugs

Many scientists have attempted to approach the obesity conundrum; some with it as their main focus, while for others it was a side outcome stemming from different research aims. Hence, was the case with Professor Svetlana Mojsov's work on glucagon related peptides and their potential as therapeutics to diabetes, which resulted in the discovery and development of the biologically active GLP-1(7-37), , that proved to have a far-reaching impact on managing obesity and other health conditions [5,11,12,13,14].

The lost treasure chest



The story of GLP-1 can be traced back to 1906, when Benjamin Moore's group at the University of Liverpool reported that an intestinal extract could lower blood glucose. Interest in this gut-derived factor intensified in the 1960s, when investigators showed that oral glucose elicited a greater insulin response than intravenous glucose, leading to the concept of the "incretin" effect. The search for the responsible gut hormone continued for nearly two decades, until 1983, when Graeme Bell and colleagues cloned the human preproglucagon gene, revealing peptides that would later prove central to this pathway. Yet identifying the gene was only part of the puzzle; the next challenge was to determine which peptide fragment was biologically active and capable of mediating the long-sought incretin effect [12,13,14,15,16].

Locating the treasure chest

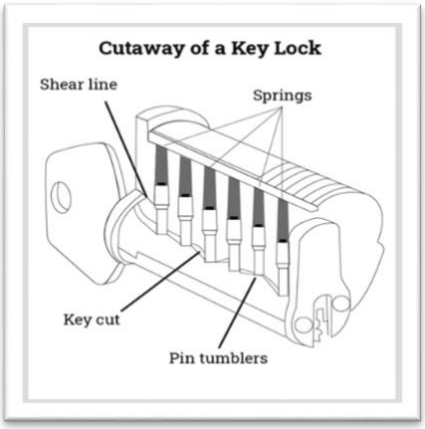
A key breakthrough came from Svetlana Mojsov's close examination of the GLP-1 sequence. She recognized that an arginine residue at position 6 could function as an enzymatic cleavage site, predicting the generation of a shorter peptide, GLP-1(7-37). This truncated form, in contrast to GLP-1(1-37), preserved the amino acid sequence necessary for biological activity and was later shown to be the active insulinotropic form of GLP-1 [4,5,11,12,13,14,15].

Unlocking the treasure chest

Drawing on her expertise in solid-phase peptide synthesis, Mojsov produced the first pure synthetic form of GLP-1, which enabled rigorous clinical studies confirming the biological activity of GLP-1(7-37) and its role in the incretin effect. She also developed sensitive detection methods that contributed to the identification of GLP-1 receptors across different tissues and anatomical sites, deepening insight into the hormone's physiological effects. [4,6,12,13,14].

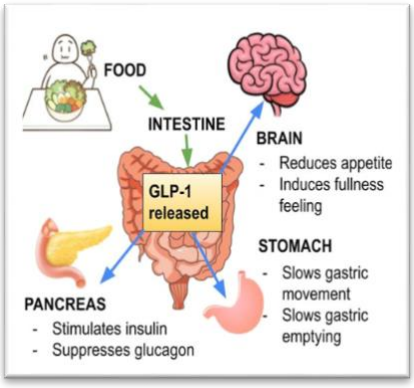
"I analyzed the amino acid sequence published by Bell and colleagues and noticed the presence of a basic arginine amino acid at position 6 in theGLP-1 sequence that could undergo enzymatic cleavage to release a 31-amino-acid GLP-1 (7-37). My critical scientific insight was that the shorterGLP-1 (7-37) showed perfect alignment with amino acids present in glucagon that were known to be important for glucagon's biological activity. Other investigators in the field focused on the longer 37-amino-acid GLP-1 (1-37) in their studies."

Svetlana Mojsov, Chemistry Matters—From a Putative Peptide to Effective Treatments for Diabetes and Obesity



The hat-trick effect:

Mojsov demonstrated that GLP-1(7-37) stimulates glucose-dependent insulin secretion from the pancreas, enabling physiologic insulin release in response to rising glucose levels while minimizing the risk of hypoglycemia associated with exogenous insulin administration [4,12]. She also showed that GLP-1 delays gastric emptying, thereby prolonging fullness. Later studies building on these findings further established that GLP-1 acts on hypothalamic centers in the brain to promote satiety and limit food intake.



“I am humbled the work I started over 40 years ago with a hypothesis has gone on to benefit the health and lives of millions of people worldwide”

Svetlana Mojsov’s acceptance speech, delivered remotely at the 48th King Faisal Prize Awarding Ceremony, Riyadh, KSA, 15 April 2026.

Conclusion:

Perseverance pays out:

Mojsov's discovery revolutionized the way physicians treat obesity and diabetes, earning her the well-deserved recognition of the 2026 King Faisal Prize in Medicine and the 2024 Lasker-DeBakey Clinical Medical Research Award, among several other prestigious international accolades, and affirming her righteous place in the history of metabolic medicine [5,6,11,13].

Her diligence and perseverance led to a landmark discovery that has greatly benefited humanity, laying the scientific foundation for therapies such as liraglutide and semaglutide, among several others, for the management of diabetes and obesity. Today, GLP-1 receptor agonist–based therapies have become central to obesity and metabolic treatment, used both as stand-alone agents and, increasingly, in combination with other therapies [11,13].

Moreover, this discovery has extended far beyond diabetes and obesity, opening new avenues for the development of therapies for other challenging conditions, including Alzheimer's disease, Parkinson's disease, chronic kidney disease, fatty liver disease, and addiction—areas that continue to be actively explored by scientists around the world [5,10,11,14].

Mojsov's influence extended into the realm of basic science, where her work added powerful new tools to the chemist's toolbox, improving the ability to detect, characterize, and synthesize pure and effective chemical compounds [13]. Her perseverance embodies the true

spirit of science in the service of humanity, meriting her place among the distinguished laureates of the King Faisal Prize.

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