Microbiome-Based Prediction, Diagnosis, and Treatment of Relapsing Obesity

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Overview

Profs. Elinav and Segal have developed a novel gut microbiome-based method to predict and prevent weight regain after weight loss. This approach uses a personalized machine-learning algorithm to analyze gut microbiome composition, identifying individuals at higher risk of regaining weight, and offering targeted interventions to sustain weight loss by modulating the gut microbiome.

Applications

Predictive Diagnostic Tool: Provides a microbiome-based test to identify individuals at high risk of post-diet weight regain.

Therapeutic Interventions: Offers potential treatments, such as microbiome modulation, to prevent weight regain and support long-term weight maintenance.

Advantages

Personalized Approach: Uses a machine-learning algorithm tailored to individual microbiome profiles for more accurate predictions and interventions.

Sustainable Weight Maintenance: Focuses on microbiome modulation rather than repeated dieting, reducing the risk of relapsing obesity and its associated health complications.

Microbiome-centered approach: Provides a potential method for weight management, potentially reducing the need for medications with side effects.

Stage of Development

The research teams have developed and validated a personalized machine-learning algorithm for predicting weight regain based on gut microbiome profiles. In mouse models, fecal transplants and post-biotic treatments have

shown promise in preventing recurrent weight gain. This research has been published in Nature1, and further studies are planned to advance the technology for clinical use.

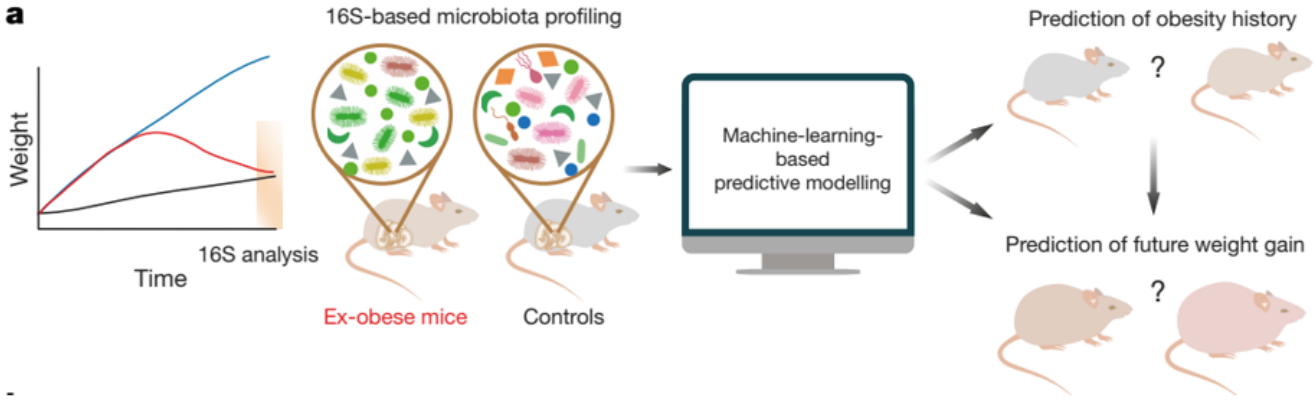

Figure 1: Schematic of microbiota-based prediction of weight-gain history and weight regain upon HFD feeding.

References

[1] Nature 2016 [1]

Patent Status

USA Granted: 12,161,679