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

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Overview

A novel gut microbiome-based method has been developed to predict and prevent weight regain after weight loss. This approach utilizes a personalized machine-learning algorithm to analyze gut microbiome composition, identify individuals at higher risk of regaining weight, and offer 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.

Differentiation

- 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.

Development Stage

A personalized machine-learning algorithm for predicting weight regain based on gut microbiome profiles was developed and validated. Fecal transplants and post-biotic treatments have shown promise in preventing recurrent weight gain in a mouse model. This research has been published in Nature [1], and

further studies are planned to advance the technology for clinical use.
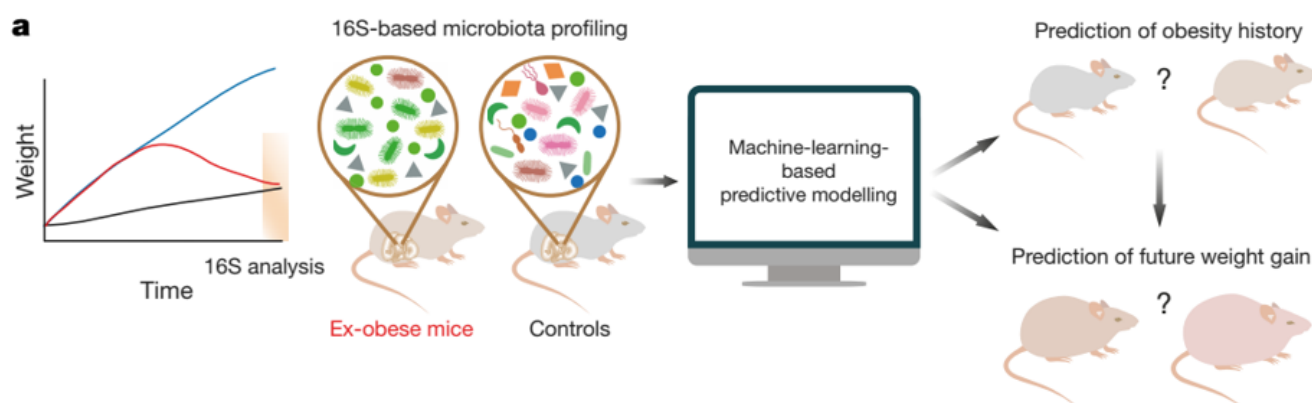
Schematic of microbiota-based prediction of weight-gain history and weight regain upon HFD feeding.

References

Thaiss [1], C., Itav, S., Rothschild, D., et al. Novel gut microbiome-based method to predict and prevent weight regain after weight loss. Nature 540, 544–551 (2016).

Patent Status

USA Granted: 12,161,679