**A Novel Method for Maintaining Target Body Weight Following a Diet Using Gut Microbiome Analysis**

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Summary:

The past century has seen an overwhelming increase in prevalence obesity, with an estimate 44% of the adult population being overweight and about 10% suffering from morbid obesity. Obesity-related pathologies are strongly associated with risk factors for stroke, diabetes, high blood pressure, musculoskeletal disorders, and ischemic heart disease, considered to be a leading cause of overall mortality.

Despite continuous efforts to find a solution for the obesity epidemic, no dietary approach has been able to maintain, for a prolonged period of time, the reduced weight after the initial weight loss. Moreover, the recurrent weight gain usually exceeds that of the pre-dieting weight, irrespective of fitness level or genetic background. This risk is further enhanced with each weight gain-loss cycle.

**Consequently, there is a strong need for the development of novel methods for weight loss and, more importantly, for maintaining the post-diet target weight.**

The groups of Prof. Eran Elinav and Prof. Eran Segal have identified a connection between the presence and amount of certain types of bacteria in gut and the risk of obesity. Based on this observation they have developed a novel method for maintaining target body weight and analyzing the likelihood of weight regain following a diet based on gut microbiome analysis. This analysis can be used to provide personalized dietary recommendation to maintain the target wight.

Applications:

* Controlling and maintaining post-diet target weight.
* Assessing the efficacy of different dietary aids.
* Augmenting the efficacy of weight loss programs by directly modulating the gut microbiome population.

Advantages:

* **Novel** – For the first time, the effects of the gut microbiome on body weight are evaluated and *treated*.
* **personalized** – Each subject is evaluated based on his/her own microbiome population, genetic variance, and dietary preferences and fitted with a personalized weight loss program.

Technology's essence:

Profs. Elinav and Segal have discovered a direct link between certain types of bacteria in the gut and the tendency for obesity and post-diet weight regain. Based on these observations, the teams have developed a novel machine learning algorithm that can analyze an individual's gut microbiome population and not only predict an individual's tendency for weight regain but also supply dietary recommendation for maintaining the target weight. Additionally, the teams have shown that the gut microbiome can be directly modulated, using different agents such as antibiotics, probiotics and flavonoids to that of a non-obese individual, improving the results of any weight loss program.