A fatty acid used to decode weight control

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Obesity can be described as an excess of fat leading to metabolic diseases and adipose tissue has a pivotal role in obesity and its related complications.

Dietary management is the conventional strategy to promote weight loss and improve health, new research suggests the central role of myristoleic acid - a minor fatty acid not found in food - could provide the answer to the success of that New Year's Resolution.

Emilie Montastier, Nathalie Villa-Vialaneix, Sylvie Caspar-Bauguil, Nathalie Viguerie and colleagues from the University of Toulouse developed a method to understand how molecular signatures of adipose tissue respond to weight control.

The study, publishing this week in *PLOS Computational Biology*, uses a data-driven approach to jointly analyze the lipidome, gene expression and phenotype from 135 obese women who took part in one of the most comprehensive dietary programs worldwide. The trial induced weight loss through an 8-week low calorie diet and a subsequent 6-month ad libitum weight maintenance diet.

A comprehensive insight of adipose tissue response during and after calorie restriction might improve obesity management. To figure out how weight change impacts the intrinsic complexity of adipose tissue biology the authors investigated the global adipose tissue network of fatty acid content and mRNAs together with bio-clinical parameters at each step of this dietary intervention.

Unravelling the complexity of adipose tissue is not an endpoint but a new starting point to understand the complexity of obesity-related complications. The research is central in nutrition research to gain deeper understanding of the interactions between nutrition and health.

More information: Montastier E, Villa-Vialaneix N, Caspar-Bauguil S, Hlavaty P, Tvrzicka E, Gonzalez I, et al. (2015) System Model Network for Adipose Tissue Signatures Related to Weight Changes in Response to Calorie Restriction and Subsequent Weight Maintenance. PLoS Comput Biol 11(1): e1004047.DOI: 10.1371/journal.pcbi.1004047