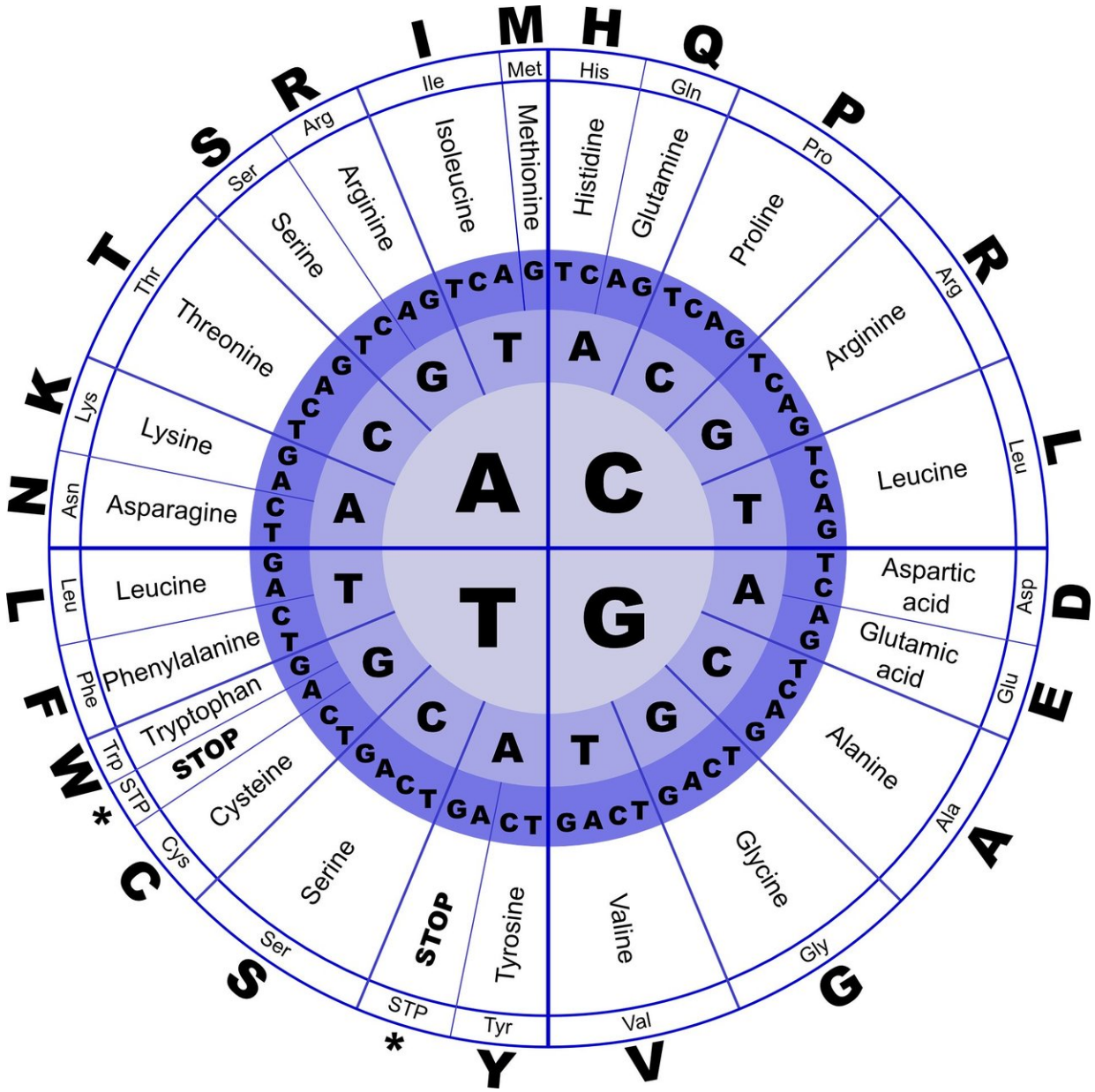
Essential components of dietary restriction revealed

June 9 2020



Credit: CC0 Public Domain

Studies by Monash Biomedicine Discovery Institute (BDI), have provided a new understanding into the roles two essential amino acids play in metabolic health, which may help scientists in the fight against obesity.

Led by Dr. Adam Rose , the recent finding, published in *Nature Communications*, shows that by reducing the amount of two amino acids—threonine and tryptophan—in young healthy mice, they were able to burn more calories than they consumed, without calorie reduction, keeping them lean and healthy and without the side-effect of lower muscle mass. A low-threonine diet even protected mice that were morbidly obese and prone to developing type 2 diabetes.

While a moderate reduction in dietary protein and therefore essential amino acids can enhance vitality, diets devoid of this component can make people sick very quickly and are not recommended. However, this study has shown that a reconsideration of the functions of these two amino acids in nutrition warrants further exploration.

"Once we understand which particular dietary components are needed for the health-promoting effects of these diets we can design strategies to mimic them, simulating the effects without having the negative side effects," Dr. Rose said.

A highlight of the study was an experiment where Dr. Rose and his team genetically manipulated the mice to be able to synthesize the essential amino acid threonine, which blocked the health promoting effects of the low threonine diet and saw the mice gain weight, proving that these two amino acids can hold the key to a new diet approach.

Dr. Matthew Piper, a key co-author adds, "We are finding an increasing number of situations in which essential amino acids are powerful modulators of lifelong health and lifespan. Our findings on their specific effects gives us exciting insights into how we might harness their benefits to drive better health."

Co-author Professor Stephen Simpson of the University of Sydney's Charles Perkins Centre said, "We are beginning to understand how critical the balance of dietary amino acids is to the control of appetite, health and aging."

More information: Yann W. Yap et al, Restriction of essential amino acids dictates the systemic metabolic response to dietary protein dilution, *Nature Communications* (2020). DOI: 10.1038/s41467-020-16568-z

Provided by Monash University