

# Unlocking New Insights into Metabolism and Longevity

Supriya Srinivasan, PhD

Associate Professor  
Department of Neuroscience  
Scripps Research

## ABOUT THE LECTURE

Professor Supriya Srinivasan revealed the biological symphony of organs, hormones and neurochemicals which control and respond to changes in our metabolism. Srinivasan demonstrated how a scientific approach that harnesses organism diversity provides researchers with the tools to study gut-brain conversations at an unprecedented speed and scale. The resulting breakthroughs in how we process energy have far-reaching implications for health and longevity.

## TOP TAKEAWAY POINTS

1. **The profound effects of metabolism are seen in all organs of the body.** When these metabolic circuits are not functioning properly, it can lead to diabetes and muscle loss, neurodegeneration, cardiovascular disease and even cancer. If we can understand how our genes and our environment influence molecular messengers in these networks, we could potentially stave off metabolic problems and increase healthy lifespan.
2. **Neurotransmitters produced in the brain play a major role in driving fat loss from the gut.** Experimentally, the loss of chemicals like serotonin causes the abnormal accumulation of fat in the intestine. The ability to use stored fat for energy is, therefore, dependent on intact neural circuits.
3. **However, the increased use of fat as fuel has the potential to create byproducts that may stress the energy-producing machinery inside cells.** A stress-protection mechanism has evolved to reduce potential damage; if this protective mechanism is lost, lifespan is reduced. These findings show that metabolism and longevity are intertwined.
4. **The gut also talks back to the brain.** The levels of different nutrients in the intestine may influence certain behaviors. Through genetic analyses, scientists are decoding the chemical signals that may be released from intestinal cells in response to these nutrients. The gut is engaged in a constant dialogue with the brain and likely other organs.
5. **Many of the same messenger molecules and receptors studied in worms are also present in mammals, including humans.** Exciting new research suggests modifying these metabolic pathways could then impact the body weight response to various diets. Armed with this knowledge, researchers are focused on translating these discoveries into novel therapeutic strategies to help solve the obesity and diabetes crisis.

