

## **Functional MRI Studies of Health Behaviors**

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People make hundreds of health decisions everyday – for example, what and how much to eat, whether to exercise, whether to use drugs such as nicotine and alcohol and, if so, how much. Health behaviors have a cumulative impact on physical and economic well-being at both the individual and national level. For example, health problems related to obesity, such as Type 2 diabetes, are expected to continue to rise and, for the first time in modern history, life expectancies in the US are anticipated to decline. Current estimates of the cost of obesity are as high as \$ 147 billion a year and obesity is the number one preventable cause of rising health care costs. In the time of a national health care debate, preventable risk factors for disease are central to controlling spiraling health costs.

There is growing interest in how the brain regulates health behaviors such as those impacting obesity. Obesity arises from chronic imbalances between energy intake and expenditure. Health-related decisions affecting energy balance are influenced by a convergence of processes in the brain, as individuals weigh the perceived balance between the rewarding and punishing aspects of behavioral choices, and whether gratification is immediate or delayed. Functional neuroimaging is proving to be a powerful tool for understanding brain mechanisms contributing to energy intake and expenditure. To illustrate these applications, Dr. Savage will briefly review functional magnetic resonance imaging (fMRI) studies of food motivation and reward processing in obese and healthy groups documenting differences in brain activation. The focus of this work is ultimately on clinical applications, such as identifying brain function predictors of success in diets and adherence to exercise programs.