



Date: March 26, 2015
Contact: Rhiannon Bugno, Editorial Office
+214 648 0880
Biol.Psych@utsouthwestern.edu

High-Fat Diet Alters Behavior and Produces Signs of Brain Inflammation

Reports new study in Biological Psychiatry

Philadelphia, PA, March 26, 2015 – Can the consumption of fatty foods change your behavior and your brain?

High-fat diets have long been known to increase the risk for medical problems, including heart disease and stroke, but there is growing concern that diets high in fat might also increase the risk for depression and other psychiatric disorders.

A new study published in the current issue of *Biological Psychiatry* raises the possibility that a high-fat diet produces changes in health and behavior, in part, by changing the mix of bacteria in the gut, also known as the gut microbiome.

The human microbiome consists of trillions of microorganisms, many of which reside in the intestinal tract. These microbiota are essential for normal physiological functioning. However, research has suggested that alterations in the microbiome may underlie the host's susceptibility to illness, including neuropsychiatric impairment.

This led researchers at Louisiana State University to test whether an obesity-related microbiome alters behavior and cognition even in the absence of obesity.

Non-obese adult mice were conventionally housed and maintained on a normal diet, but received a transplant of gut microbiota from donor mice that had been fed either a high-fat diet or control diet. The recipient mice were then evaluated for changes in behavior and cognition.

The animals who received the microbiota shaped by a high-fat diet showed multiple disruptions in behavior, including increased anxiety, impaired memory, and repetitive behaviors. Further, they showed many detrimental effects in the body, including increased intestinal permeability and markers of inflammation. Signs of inflammation in the brain were also evident and may have contributed to the behavioral changes.

"This paper suggests that high-fat diets impair brain health, in part, by disrupting the symbiotic relationship between humans and the microorganisms that occupy our gastrointestinal tracks," commented Dr. John Krystal, Editor of *Biological Psychiatry*.

Indeed, these findings provide evidence that diet-induced changes to the gut microbiome are sufficient to alter brain function even in the absence of obesity. This is consistent with prior research, which has established an association between numerous psychiatric conditions and gastrointestinal symptoms, but unfortunately, the mechanisms by which gut microbiota affect behavior are still not well understood.

Further research is necessary, but these findings suggest that the gut microbiome has the eventual potential to serve as a therapeutic target for neuropsychiatric disorders.

The article is "Obese-type Gut Microbiota Induce Neurobehavioral Changes in the Absence of Obesity" by Annadora J. Bruce-Keller, J. Michael Salbaum, Meng Luo, Eugene Blanchard IV, Christopher M. Taylor, David A. Welsh, and Hans-Rudolf Berthoud (doi: 10.1016/j.biopsych.2014.07.012). The article appears in *Biological Psychiatry*, Volume 77, Issue 7 (April 1, 2015), published by Elsevier.

#

Notes for editors

Full text of the article is available to credentialed journalists upon request; contact Rhiannon Bugno at +1 214 648 0880 or Biol.Psych@utsouthwestern.edu. Journalists wishing to interview the authors may contact Annadora Bruce-Keller at +1 225 763 2735 or annadora.bruce-keller@pbrc.edu.

The authors' affiliations, and disclosures of financial and conflicts of interests are available in the article.

John H. Krystal, M.D., is Chairman of the Department of Psychiatry at the Yale University School of Medicine, Chief of Psychiatry at Yale-New Haven Hospital, and a research psychiatrist at the VA Connecticut Healthcare System. His disclosures of financial and conflicts of interests are available [here](#).

About *Biological Psychiatry*

Biological Psychiatry is the official journal of the [Society of Biological Psychiatry](#), whose purpose is to promote excellence in scientific research and education in fields that investigate the nature, causes, mechanisms and treatments of disorders of thought, emotion, or behavior. In accord with this mission, this peer-reviewed, rapid-publication, international journal publishes both basic and clinical contributions from all disciplines and research areas relevant to the pathophysiology and treatment of major psychiatric disorders.

The journal publishes novel results of original research which represent an important new lead or significant impact on the field, particularly those addressing genetic and environmental risk factors, neural circuitry and neurochemistry, and important new therapeutic approaches. Reviews and commentaries that focus on topics of current research and interest are also encouraged.

Biological Psychiatry is one of the most selective and highly cited journals in the field of psychiatric neuroscience. It is ranked 5th out of 135 Psychiatry titles and 14th out of 251 Neurosciences titles in the Journal Citations Reports® published by Thomson Reuters. The 2013 Impact Factor score for *Biological Psychiatry* is 9.472.

About Elsevier

Elsevier is a world-leading provider of information solutions that enhance the performance of science, health, and technology professionals, empowering them to make better decisions, deliver better care, and sometimes make groundbreaking discoveries that advance the boundaries of knowledge and human progress. Elsevier provides web-based, digital solutions — among them [ScienceDirect](#), [Scopus](#), [Elsevier Research Intelligence](#) and [ClinicalKey](#) — and publishes over 2,500 journals, including [The Lancet](#) and [Cell](#), and more than 33,000 book titles, including a number of iconic reference works. Elsevier is part of [RELX Group plc](#), a world-leading provider of information solutions for professional customers across industries.