News About The Brain in Your Belly

New research about how your belly communicates with your brain

Livingston, NJ, August 24, 2007 -- (PR.com)-- Smart Food: Diet and Nutrition for Maximum Brain Power just released by ASJA/iUniverse written by a neurosurgeon, Arthur Winter, MD, director of New Jersey's Neurological Institute, and veteran science writer, Ruth Winter, MS , describes the new research on the effects of diet on the brain and, conversely, of the brain on diet. It spotlights the brain and belly chemicals that cause us to eat or stop eating; and the nutrients that affect our mental prowess and our moods.

The brain/food link is not new to us modern humans. We know from experience that we can use food to alter our moods. Caffeine is the most common psychoactive (mind for mood altering) drug in the world. Ice cream and candy are typically used as rewards or consolations. Steak and potatoes make some men feel manlier, just as losing weight helps raise a woman's self esteem.

The correlations between food, dietary supplements, and the brain, however, are often hard to make because behavioral changes are subtle and there are confounding factors such as culture and stress. Food represents tradition, reward, and love. It is the focal point of most social gatherings. It is a cultural obsession on which Americans spend millions of dollars each year on books, devices, and special diets. Nevertheless, as anyone who has had a hangover from too much alcohol or irritability due to hunger knows, what we eat and drink can influence how our brains function and, subsequently, our intellect and our behavior.

Researchers in the Department of Neuroscience at Mount Sinai School of Medicine just recently identified taste receptors in the human intestines. The taste receptor T1R3 and the taste G protein gustducin are critical to sweet taste in the tongue. The New York investigators found the two sweet-sensing proteins are also specialized taste cells of the gut where they sense glucose (sugar) within the intestine.

“We now know that the receptors that sense sugar and artificial sweeteners are not limited to the tongue. Our work is an important advance for the new field of gastrointestinal chemosensation - how the cells of the gut detect and respond to sugars and other nutrients,” says lead author, Robert F. Margolskee, MD, PhD Professor of Neuroscience at Mount Sinai School of Medicine. “Cells of the gut taste glucose through the same mechanisms used by taste cells of the tongue. The gut taste cells regulate secretion of insulin and hormones that regulate appetite. Our work sheds new light on how we regulate sugar uptake from our diets and regulate blood sugar levels.”

The new findings, published online in the August 20th, 2007 “Early Edition” of the Proceedings of the National Academy of Sciences, may lead to new treatments for obesity and diabetes.”

“This work may explain why current artificial sweeteners may not help with weight loss, and may lead to the production of new non-caloric sweeteners to better control weight,” says Dr. Margolskee. “Sensing
glucose in the gastrointestinal tract is the first step in regulating blood sugar levels.”

“While scientists are just now trying to identify the neurochemical connections between gut and brain,” Dr. Winter says, “we all experience this interaction 'in the pit of our stomachs' under periods of high emotion. In such instances, we are conscious of what is happening between our bellies and brains. Most of the time, however, we are unaware of this interaction. We may be in a 'bad mood' and not realize it is because we skipped breakfast. Our nerves may be 'on edge' because we had that third cup of coffee or we may feel sleepy after a 'heavy meal' and still not make the connection between our central nervous systems and substances we ingested.

“Our mental function is directly related to what we eat or don't eat because our brains are chemical factories that produce dozens of different psychoactive drugs. We eat the starter materials for these brain chemicals which we make into the chemicals that affect our intelligence, memory, mood, appetite, and weight control.”

New research is proving that our digestive systems also are chemical factories. In the linings of the esophagus, stomach, small intestine and colon, there are millions of nerve cells that send out stop and go messages to our brains. The components of this digestive control center are lumped under the title the enteric (from the Greek entera meaning bowels) nervous system. Current thinking among a number of scientists is that there is a "brain" in the gut, independent from the brain encased in the skull and that the enteric nervous system may be able to learn and remember independently of central nervous system.

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