The Interaction of Brain Serotonin and Neuropeptide Y on Food Intake

The effects of injecting serotonergic (5-HT) drugs and neuropeptide Y (NPY) into the paraventricular nucleus (PVN) of the hypothalamus of rats and taking note of any changes in food intake were investigated. This was approached from two avenues.

First we wanted to see if microinjecting NPY into the PVN of the hypothalamus increased their feeding responses. It was observed that the amount that the rats ate increased. Secondly we were interested in microinjecting serotonergic drugs (DOI, RU24969 and TFMPP) into the same area, to see if this produced a blocking of the effects of the NPY. Of the three drugs that were used, only DOI reduced feeding evoked by PVN NPY.

DOI, like 5-HT, is known to bind to 5-HT2A/2C receptors within the brain. Therefore, 5-HT may interact with endogenous NPY, via 5-HT2A2C receptors to modulate ingestive behavior.

One additional point is worth mentioning. The above feeding responses were observed and compared to control injections. Under control conditions, rats were injected with sterile water in order to verify that the increases or decreases in feeding were as a result of the drug treatment and not due to other factors associated with the injection procedure (i.e., simply due to handling).

The above findings are consistent with other research implicating brain neurotransmitter and peptide systems in controlling food intake, particularly within the hypothalamus. These same systems may be implicated in the etiology and treatment of eating-related disorders such as bulimia, binge eating, and obesity.