

Preventing Obesity Through Regulation of a Neural Chemical

Competitive Advantages

- ☑ Could offer novel approach to obesity prevention & control.
- ☑ Based on well-known biochemical process.
- ☑ May benefit millions of patients worldwide.
- ☑ Could minimize side effects and provide long-term efficacy.

Obesity is a serious public health problem that predisposes patients to life-threatening diseases such as diabetes, hypertension, and stroke. While diet, exercise, surgery, and pharmaceuticals have been used as treatments, each approach has been limited in its long-term safety and effectiveness.

A Stress Response

New research suggests that a stress-related biochemical process in the sympathetic nervous system may be a significant factor in the development of obesity. In addition, compounds that block or regulate this process may offer a safe and effective treatment of the condition.

Stress causes neurons in the sympathetic pathway to release a chemical messenger, pituitary adenylate-cyclase activating peptide (PACAP), which then signals other neurons to release neuropeptide Y (NPY). The NPY stimulates appetite and acts directly on fat cells, causing them to enlarge and multiply.

Regulating PACAP & NPY

Several compounds have been identified that block NPY signaling. In animal testing, they mitigate the effects of NPY on fat cells and prevent weight gain, even when high-calorie diets are consumed.

In addition, when the PACAP gene is experimentally deleted in mice, the test animals' body fat decreases substantially.

If modified for greater potency and selectivity, compounds known to regulate PACAP and downstream NPY signaling could prove effective against human obesity. Additional compounds may be found that also block or reduce PACAP signaling and prevent weight gain.

Next Steps

Potential PACAP inhibitors and receptor antagonists, natural and synthetic, will be screened through cell testing. Those that demonstrate the ability to regulate PACAP signaling will be considered for animal testing.

Patent / Licensing Status

Patent pending. Exclusive rights available.

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PACAP article
www.uvm.edu/~annb/faculty/PDFs/27702.pdf

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