Protein sequences for therapeutic applications in management of obesity, cachexia and nausea

Inventors
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STAGE OF DEVELOPMENT

- Preclinical Discovery

PATENT

- US Provisional Patent Application filed 2019

APPLICATIONS

- Treatment of obesity or cachexia
- Overcome nausea associated with chemotherapy and morning sickness

ADVANTAGES

- New targets that will help the discovery of drug for treating obesity, cachexia or nausea
- Can be designed to target the specific site only avoiding brain penetration
- Potential to increase quality of life for people suffering from obesity, cachexia and nausea

DESIRED PARTNERSHIPS

- License
- Co-development

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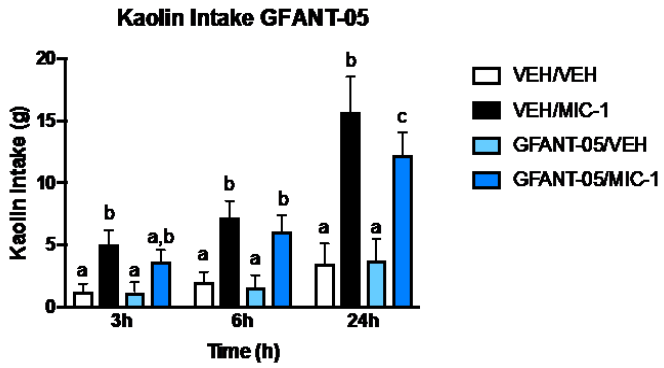
Technology Overview

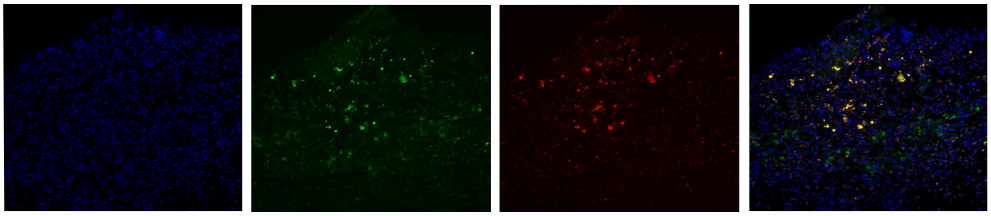
Invention: Novel peptides that enhance or suppress the activity of a cytokine associated with obesity and nausea.

Long-term weight management is a huge current problem. Nausea/Emesis from chemotherapy and morning sickness is difficult to manage and can be extremely debilitating and compromise individual quality of life. Growth differentiation factor-15 (GDF15) is a broadly expressed cytokine, whose levels correlate with progression of many diseases. It has been shown in multiple species that elevated levels of GDF15 drives weight loss primarily by reducing total food intake. An increased level of GDF15 is also seen after a cancer therapy that occurs concomitant with nausea and/or emesis. An increase of GDF15 is also observed in pregnancy and may be associated with 'morning-sickness'. In 2017 the receptor (GFRAL) responsible for mediating the anorectic actions of GDF15 was identified, making a promising therapeutic target for treatment of disorders such as obesity, anorexia and nausea associated with chemotherapy and pregnancy.

In a collaboration between UPENN and Syracuse University the inventors created non-naturally occurring peptides that either enhance or suppress the effects of the hormone GDF15. By targeting the hormone receptor (GFRAL), agonists such as GFANT-01 may be useful to treat obesity and antagonists such as GFANT-05 (a.k.a. GRASP) to treat cachexia as well as nausea associated with chemotherapy or morning sickness.

GFANT-05 (a.k.a. GRASP) (300pmol) attenuates pica induced by Mic-1





GRASP-555 shows co-localization with GFRAL-expressing neurons in the area postrema and nucleus tractus solitarius of the brainstem.