**Background**

Obesity treatment market **15 billions**

Anti-obesity drug market **8.4 billions by 2022**

**Peptide YY**

A GI hormone that can restrain our appetite. Its binding with receptor Y2R in hypothalamus decreases our appetite and inhibits eating.

**Methodology**

**Fusion Protein**

Healthin is a designed fusion protein included peptide YY and several auxiliary peptide.

**Nisin Selection**

A food-grade selection method is required for our further use of Healthin in human beings. We choose nisin, a kind of bacteriocin, as our selection marker. Studies have shown that the immunity lipoprotein NisI is able to protect cell membrane from the pore-forming activity of nisin.

**Suicide**

To prevent environmental pollution and over-dosage, we have designed a suicide part to control death-time.

**Modeling**

We tried to simulate the pathways of designed *L. casei* and secreted CPP-PYY complex from oral ingestion to final PYY releasing. The ultimate goal is to build the general formula, and to find out the suitable and optimal dose for Healthin. The pathways consist of 5 parts:

1. Bacteria distribution
2. CPP-PYY penetration efficiency
3. Absorption into bloodstream
4. Thrombin cleavage efficiency
5. Healthin drug effect

We applied MATLAB for calculation and simulation. Here we considered 10^5 of total L. casei intake, and 10^{-10} mg/min of complex production rate per L. casei. The optimal concentration of PYY is 0.1 μg/L for appetite suppression ideally. The result of final concentration of PYY (μg/L) in the blood is shown below.

**General formula :**

$$\frac{[\text{Final concentration of PYY in the blood (μg/L)}]}{[\text{Total L. casei intake}] \times [\text{Distribution ratio of L. casei}] \times [\text{CPP-PYY complex production rate per L. casei (μg/min)}]}$$

**Reference**


**Our Team**

- NTU, I-GEM - Taiwan

**Human Practice**

- Street random survey
- Promoting health information on Facebook fan page
- Publicizing health information through holding conference
- Skype and meetup with team Oxford
- Small conference with team Mingdao Asia Meetup at NCTU

**Acknowledgment**

WIKI http://2015.igem.org/Team:NTU-UHPNO-Taiwan
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