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The Behavioral Basis for Wegovy® (Semaglutide)-induced Weight Loss
New weight-loss drugs are powerful tools in efforts to reduce obesity

- **Wegovy® ≈ Ozempic® ≈ Semaglutide**

- Based on one of the body’s own signals, but lasts longer\(^1\)

- Produces ~ 15% body weight loss\(^1\)

- Can have unpleasant side-effects, but dose escalation helps\(^1\)\(^-\)\(^3\)

- How does **SEMAGLUTIDE** change eating behavior to produce weight loss?

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Humans behave in response to physiological and psychological factors.
Preclinical models help separate physiological and psychological effects

**Humans**

- Want to lose weight
- Are exposed to diet advice and are motivated to follow it
- Long-term objective measures are expensive and impractical
- Rely on memory and self-report

**Rats**

- Don’t care how much they weigh
- Don’t listen to diet advice
- Long-term monitoring is relatively inexpensive and practical
- Allow objective measurement of behavior
How did I study the effects of semaglutide on eating behavior?

Experimental Timeline

16 male rats (8/group)  
*ad libitum* chow  
& water throughout
Semaglutide reduced food intake and body weight


**Food Intake Compared to Pretreatment Baseline**

<table>
<thead>
<tr>
<th>Day</th>
<th>T = Treatment Effect; D = Day Effect; I = Interaction</th>
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<tbody>
<tr>
<td>E-1</td>
<td>(T)</td>
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<td>E-2</td>
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<td>E-9</td>
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<td>E-10</td>
<td>(T, D, I)</td>
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</table>

**T = Treatment Effect; D = Day Effect; I = Interaction**

**Body Weight Change From Baseline at the End of the Dose Maintenance Period**

- **Control**: Up 5%
- **Treatment**: Down 10%
Eating less results from fewer or smaller meals

- FEWER MEALS = INCREASED SATIETY
- SMALLER MEALS = INCREASED SATIATION
Semaglutide did not change meals per day (i.e., satiety)

Number of Meals/Day Compared to Pretreatment

T = Treatment Effect; D = Day Effect; I = Interaction

Semaglutide increased satiation and reduced motivation to eat

**A. Average Meal Size Compared to Pretreatment**

- **T** = Treatment Effect; **D** = Day Effect; **I** = Interaction

**B. Average Meal Duration Compared to Pretreatment**

**C. Average Meal Eating Rate Compared to Pretreatment**

**SMALLER MEALS + SHORTER MEAL DURATION = INCREASED SATIATION**

**SLOWER EATING RATE = DECREASED MOTIVATION**

How does semaglutide change eating behavior to produce and maintain weight loss?

Satiation + Motivation

Produce early weight loss

Thank you!

Chronic Semaglutide Treatment in Rats Leads to Daily Excessive Concentration-Dependent Sucrose Intake

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