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The Behavioral Basis for Wegovy® (Semaglutide)-induced Weight Loss

The Office of Postdoctoral Affairs

The Graduate School | Florida State University

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 longer¹
- Produces ~ 15% body weight loss¹
- Can have unpleasant side-effects, but dose escalation helps¹⁻³
- How does SEMAGLUTIDE change eating behavior to produce weight loss?

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Medical Mystery Shrouds Drugs for Weight Loss

By GINA KOLATA

Every so often a drug comes along that has the potential to change the world. Medical specialists say the latest to offer that possibility are the new drugs that treat obesity - Ozempic, Wegovy, Mouniaro and more that may soon be coming onto the market.

It's early, but nothing like these drugs has existed before.

"Game changers," said Jonathan Engel, a historian of medicine and health care policy at Baruch College in New York.

Obesity affects nearly 42 percent of American adults, and yet, Dr. Engel said, "we have been powerless." Research into potential medical treatments for the condition led to failures. Drug

Shift in Society's View of Obesity, but Why Do They Work?

companies lost interest, with many executives thinking - like most doctors and members of the public - that obesity was a moral failing and not a chronic disease.

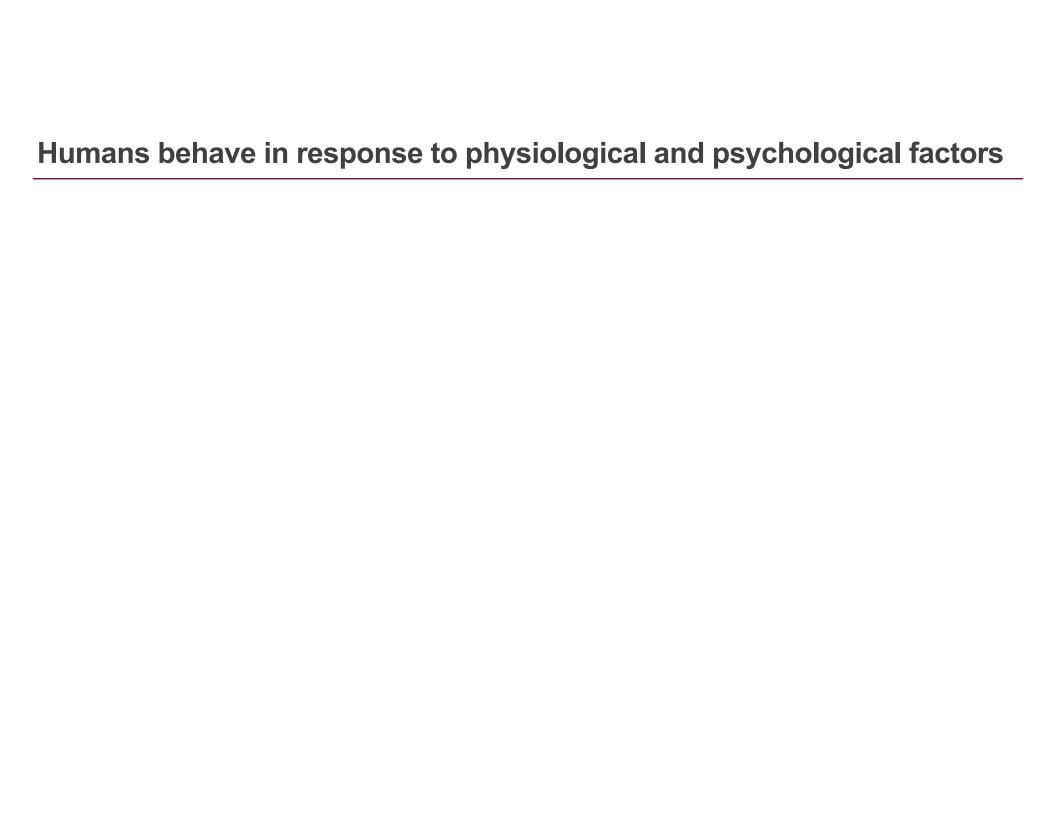
While other drugs discovered in recent decades for diseases like cancer, heart disease and Alzheimer's were found through a logical process that led to clear targets for drug designers, the path that led to the obesity drugs was not like that. In fact, much about

shrouded in mystery. Researchers discovered by accident that exposing the brain to a natural hormone at levels never seen in nature elicited weight loss. They really don't know why, or if the drugs may have any long-term side ef-

"Everyone would like to say there must be some logical expla nation or order in this that would allow predictions about what will work," said Dr. David D'Alessio. chief of endocrinology at Duke who consults for Eli Lilly among others, "So far there is not."

Although the drugs seem safe, obesity medicine specialists call for caution because - like drugs for high cholesterol levels or high blood pressure - the obesity

Continued on Page A16



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



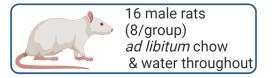
Rats

- ✓ 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

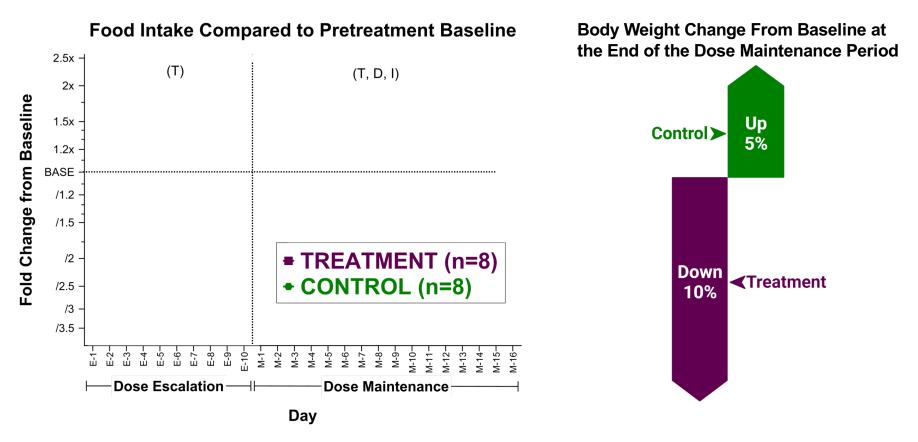


How did I study the effects of semaglutide on eating behavior?

Experimental Timeline



Semaglutide reduced food intake and body weight



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

Eating less results from fewer or smaller meals

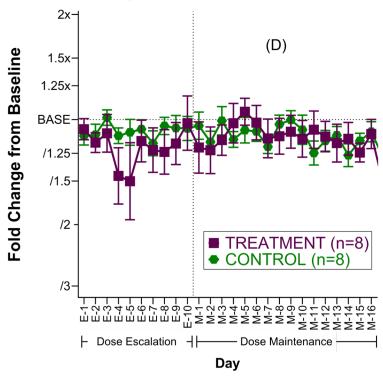


FEWER MEALS = INCREASED SATIETY

SMALLER MEALS = INCREASED SATIATION

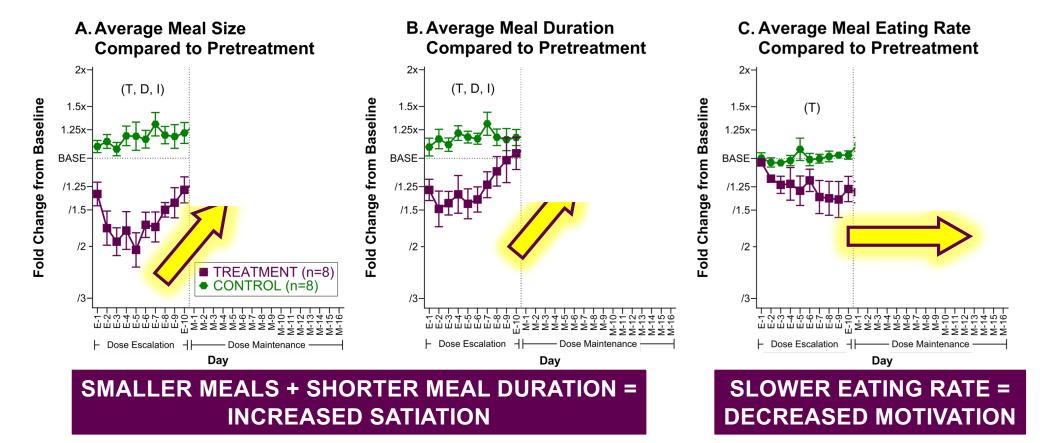
Semaglutide did not change meals per day (i.e., satiety)

Number of Meals/Day Compared to Pretreatment



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

Semaglutide increased satiation and reduced motivation to eat



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

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



Produce early weight loss

Thank you!





JOURNAL ARTICLE

Chronic Semaglutide Treatment in Rats Leads to Daily Excessive Concentration-Dependent Sucrose Intake 3

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