

# Weighty Research in Medicon Valley

By Chris Tachibana

***Those two potato chips will lead to obesity. But don't worry, you can burn them off through sex. Wrong, say Medicon Valley scientists. The secret to fighting obesity is research and time***

The good news is that Scandinavian countries do not have the drastic obesity problem of the United States or the United Kingdom. The bad news is our obesity rate is increasing. In Denmark, obesity prevalence doubled from 1987 to 2001- most alarmingly among young adults. Fortunately, Medicon Valley has some of the world's best obesity researchers studying prevention and treatment. Denmark and Sweden are in the top 15 countries for obesity research, according to a 2010 Thomson Reuter's ranking. One reason is the University of Copenhagen's Department of Nutrition, Exercise and Sports, which has some of the most productive scientists in the field, including the highly public figure Professor Arne Astrup. Anne Birgitte Raben, a professor in the department, attributes the

quality of Nordic obesity research to positive feedback: excellent research attracts the best scientists who do more excellent research. - Arne Astrup, and in Sweden, Professor Stephan Rössner (Karolinska Institutet), are very active, including writing books and being on television and doing other things that reach a broad public. That attracts students and researchers and other people who want to work in the area, says Professor Raben.

## **Educating the public and individualizing obesity treatments**

Debunking popular myths about obesity with a careful review of the medical literature is just one example of the University of Copenhagen's high-profile, high-impact work. Professor Astrup and colleagues from several universities in the United States published a 2013 special article in the New England Journal of Medicine called "Myths, Presumptions, and Facts about Obesity".

One obesity myth that persists, even in the clinical literature, is that small, sustained dietary changes, like eating a few extra chips or walking a few extra steps, eventually adds up to meaningful weight changes. The idea comes from oversimplistic calculations based on old experiments done under specialized conditions to estimate the number of calories in a kilogram of body weight. In reality, weight loss and gain are complicated by the body's compensation mechanisms, which vary by

individual. And sorry, but another weight-loss myth is that boosting your sex life will make you thin. Moving is healthy of course, but walking and sexual activity expend the same number of calories, so there's nothing special about sex - from an exercise standpoint. To the obesity myth list, Professor Raben adds the idea that artificially sweetened drinks like diet soda increase appetite, leading to weight gain. Water is the best drink, she says, but if you want something sweet, choose a beverage with artificial sweeteners instead of sugar.

Besides being entertaining, these facts are important for public awareness, says Professor Raben. Getting people to think about their eating and exercise habits are just two of the many tactics we need to fight obesity.

- There will not be one model that fits everybody, and there will not be a simple answer to obesity, so we need multiple research activities. We know a lot already, and we can certainly help a lot of people who want to decrease their weight or maintain a normal weight. However, it could take time to find the treatments that fit each individual - some people will react well to a change in lifestyle, for some, surgery is necessary, and sometimes a drug is best, says Professor Raben.

## **When diet and exercise are not enough**

David Solomon, MD, Chief Executive Officer of Zealand Pharma, is working on the medication

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*- There will not be one model that fits everybody, and there will not be a simple answer to obesity, so we need multiple research activities, says Professor Anne Birgitte Raben, University of Copenhagen's Department of Nutrition, Exercise and Sports*



*- It is hard to get obesity drugs to market right now, not because we can not develop the drugs, but because right now, obesity is not considered a disease, says David Solomon, MD, Chief Executive Officer of Zealand Pharma*

approach to obesity, although he focuses on associated conditions, for both clinical and business reasons. Obesity comorbidities such as cardiovascular disease and diabetes are serious health concerns by themselves, says Solomon. They are also driving the development of obesity drugs. Health insurance and government health programs do not recognize obesity as a disease so they do not pay (reimburse) for treatment.

- It is hard to get obesity drugs to market right now, not because we can not develop the drugs, but because right now, obesity is not considered a disease. Even if you can get a drug approved, its not reimbursable, so it will not sell, says Dr. Solomon. So Zealand Pharma and other companies are addressing obesity using an oblique strategy - develop drugs to treat associated conditions such as diabetes, while looking for the added benefit of weight loss. For example, Dr. Solomon points to lixisenatide, developed by Zealand Pharma and licensed to Sanofi.

Although largely developed as a diabetes drug, this GLP-1 receptor agonist, which mimics the insulin-releasing effects of the GLP-1 peptide hormone, also appears to promote weight loss. Lixisenatide (as Lyxumia®) was recently approved by the European Medicines Agency and is under review by the United States Food and Drug Administration. In partnership with Boehringer Ingelheim, Zealand is developing the peptide drug ZP2929, with a mechanism similar to lixisenatide. ZP2929 is now in Phase I trials to determine its safety and tolerability.

#### Resource websites:

*New England Journal of Medicine:*  
"Myths, Presumptions and Facts about Obesity"  
[www.nejm.org/doi/full/10.1056/NEJMsa1208051](http://www.nejm.org/doi/full/10.1056/NEJMsa1208051)

Zealand Pharma  
[www.zealandpharma.com](http://www.zealandpharma.com)

#### The real solution? Knowledge and time

Like Professor Raben, Dr. Solomon advocates a variety of tactics to combat obesity. In particular, he says, we need basic research on the fundamental biology and physiology of obesity. This will support obesity treatment in several ways. Knowing about the biological of obesity could identify new therapeutic targets. Understanding the mechanisms of obesity could lead to its recognition as a disease with treatments reimbursed by health plans.

- We first have to understand the biology and the mechanisms of obesity - why people eat, feel full, store fat - and the effects of different types of fat on overall health and cardiovascular disease. Over the next ten years, Denmark, Sweden, Norway, and Finland should focus on understanding the basic biology of obesity, then use the mechanisms we learn to develop good diagnostics and targeted new medicines to determine the best treatment for each person. We will figure this out, but it is going to take years, ends Dr. Solomon.

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