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Hello *Mollie Medcast* listeners and welcome back. *Mollie Medcast* is the podcast for the biomedical journal, *Molecular Medicine*. My name is Margot Puerta, I'm the managing editor here at Molecular Medicine and your host for this podcast episode. In this week's podcast we're going to discuss diabetes and take a look at two manuscripts from recent issues: **Boning Up On Hyperglycemia** and **The Skinny On Fat Cells**.

But let's start with our favorite thing, *Molecular Medicine's* goal. Our mission is to publish novel work that's concerned with understanding the pathogenesis of disease at the molecular level. This may lead to the design of specific molecular tools for disease diagnosis, treatment, and prevention. If you're interested in submitting a manuscript to the journal, please visit our Web site for information, [www.molmed.org](http://www.molmed.org).

About 8% of the United States population is diagnosed with diabetes<sup>1</sup> and we probably all know someone who has this disease. The cause of diabetes has to do with the hormone insulin. The body either doesn't produce it properly or doesn't use it properly. The four major types of the disease include Types I and II, Gestational, and Pre-Diabetes. Several lifestyle changes help manage diabetes, however, those affected may be at an increased risk for other complications such as stroke, neurological issues, kidney disease and blindness<sup>1</sup>.

So the first diabetes-related manuscript we'll go over is:

**Boning Up On Hyperglycemia**

Endothelial progenitor cells (or EPCs) are, like lymphocyte pre-cursors, derived from bone marrow and can differentiate into endothelial cells, these comprise the inner cell layer of blood vessels.<sup>2</sup> These EPCs are critical for maintaining the integrity and health of the vasculature. In diabetes, however, the numbers of these cells in the circulation are reduced. This may lead to ischemic vascular disease in these patients. In this work Dr. Cindy Loomans and her colleagues in The Netherlands study the relationship between EPCs and hyperglycemia. The title of the manuscript is "Differentiation of Bone Marrow-Derived Endothelial Progenitor Cells Is Shifted into a Proinflammatory Phenotype by Hyperglycemia." The authors demonstrate that hyperglycemia drives the fate of EPCs away from forming helpful, pro-angiogenic cells capable of remodeling the endothelium, towards forming proinflammatory cells instead. This work helps us appreciate the underlying cause of vascular complications in diabetic patients and may serve to outline a specific use of bone marrow cells in neovascularization therapy.

The second manuscript is called:

**The Skinny On Fat Cells**

I love that title! Although obesity rates are the highest in the United States<sup>3</sup>, countries worldwide are experiencing increased obesity percentages as well. With increasing waist sizes and body mass indices come associated health concerns that have garnered significant attention in recent years. Of these concerns, insulin resistance and type 2 or adult-onset diabetes [T2D] are both strongly associated with obesity. However, the short-term effects of a fast food diet on insulin signalling had not been explored. Dr. Anna Danielsson and colleagues in Sweden tested this in a manuscript titled, "Short-Term Over-Eating Induces Insulin Resistance in Fat Cells in Lean Human Subjects". Lean healthy volunteers agreed to eat two fast food meals a day and to limit their steps to 5000 a day. They did this for 4 weeks! Adipocytes were examined before and after increases in body weight

for changes in insulin dependent markers, such as receptor expression and specific phosphorylation patterns. Dr. Danielsson found that, in as little as 4 weeks, signalling and expression of insulin pathway components in these subjects mirrored events found in adult-onset diabetes. This study advances a human model for how diabetes may develop in otherwise healthy individuals. It also provides further evidence that a high-calorie, high-fat diet is a significant risk factor for adult-onset diabetes. So put down that bacon cheeseburger and go out for a walk!

Doctors at the North Shore-LIJ Health System in New York are currently participating in various studies on Type I diabetes. In one of the international studies underway, doctors are researching the history of Type I diabetes by recruiting family members of Type I diabetes patients to test for autoantibodies. Studies have shown that those with autoantibodies may be at a higher risk for developing the disease. To learn more, visit [www.diabetestrialnet.org](http://www.diabetestrialnet.org).

That's it for this week's episode of *Mollie Medcast*. For questions or comments regarding this podcast, please feel free to send me an e-mail at: [margot@molmed.org](mailto:margot@molmed.org), that's m-a-r-g-o-t@m-o-l-m-e-d.org. You can also e-mail me if you have any scientific meetings that you'd like us to display on our Web site.

This podcast is available on [molmed.org](http://molmed.org) and is up in iTunes. *Molecular Medicine* is published bimonthly by The Feinstein Institute for Medical Research.

From Long Island, New York, this is [margot@molmed.org](mailto:margot@molmed.org), thanks for listening!

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