

Interview 1 with Peter:

1. Q: How did you first become involved with the Celiac Disease Center at Columbia University?

A: I started the Celiac Center as a way of raising money to complete research. A lot of people had begun research on Celiac Disease, however, there were no readily available funds. So, I started to ask patients to contribute towards the Celiac Disease Center that we started. It was interesting because a donor gave us money for patient care, and that actually helped reinforce the multidimensional aspect of the center. The objective of the center then evolved to enhance patient care, to perform research, and to educate patients and the public.

2. Q: What do you believe the future of Celiac Disease is?

A: The future of Celiac Disease, to me, is more people getting diagnosed, more people with a good quality of life in which the patient can run the diet, rather than the opposite relationship, and the availability of therapies. Initially, the therapies will be to help people adjust to a gluten free diet and hopefully eventually, will cure the condition. The reason that this has not happened yet is because there has been very limited research in the field.

3. Q: The *Wall Street Journal* article published an article about ImmunogenX's creation and the trial of an enzyme called latiglutenase. Can you tell me what this drug supposed to do?

A: It is supposed to digest the toxic fragments of gluten that people with Celiac Disease cannot digest. Normally, the stomach, small intestine, and pancreatic enzymes digest proteins, but wheat has these very resistant proteins which in the case of a Celiac Disease patient, is resistant to digestion. Latiglutenase provides enzymes to digest the gluten that cannot be broken down on its own. However, this enzyme would not be able to digest all of the gluten in say, a sandwich or a pizza - that requires more potent enzymes, which are being developed and tested as well.

4. Q: What do you think about latiglutenase?

A: Well, I have been involved in these companies since they started. I have helped them raise money and helped them design their studies. This enzyme works if people are eating gluten, which is hard to avoid for some. I believe that this is one of the several therapies that will work - it just had to be proven along the strict criteria that the FDA develops to be able to go on the market as a pharmaceutical agent. Currently there are glutenases on the market, but they have not been proven to work at all, and they have not been subject to the rigorous testing demonstrating that they are safe and efficient for individuals.

5. Q: What effects does this drug have on the Celiac Disease Center?

A: I think that there are several effects. As I have mentioned, we have been involved in these different companies that are making these medicines, so we are going to be enrolling patients in these studies, which will have a positive impact on the Center. Also, I think that this medicine could result in more people coming to the center because if they have Celiac Disease, their doctors might not be aware of the role of this medicine and who should prescribe it.

6. Q: Do you think that there will be a cure for Celiac Disease?

A: I do. I think that eventually therapies will develop in order to modulate the immune system, which will eventually allow people to eat gluten. All this will take is more research. Celiac Disease has really suffered because of the lack of research. If you compare the volume of research performed on Celiac Disease to any other condition - diabetes, Crohn's disease, cancer, heart disease - it's infinitely small. This is because patients are not being asked to contribute to the research, there is no support from the pharmaceutical industry, and since there is such limited research and so few experts on the subject, the National Institutes of Health is providing very limited amounts of funds towards Celiac Disease research.

Interview 2:

7. Q: Do you have any general advice for someone who is gluten free?

A: Someone with Celiac Disease should be under the care of a dietitian because it is believed that the gluten free diet is not an innately healthy diet. Seeing a dietitian can allow the patient to make sure their diet is truly gluten free and to make sure the diet is healthy and diverse. On a gluten free diet, most people tend to eat the same foods because they know they are safe, however, that might not constitute the healthiest eating habits. There is some concern that by the nature of what some people eat, people can develop elevated heavy metal levels such as lead, mercury, arsenic.

8. Q: So how can people on a gluten free diet regulate the amount of toxins they ingest?

A: I think they need to attempt to have a diverse diet, including those inherently gluten free items such as fruits, vegetables, dairy, meat, and lots of whole grains. We actually did a study that showed that people who are on a very low gluten diet have increased heart disease because they do not eat whole grains.

9. Q: Do you think the gluten free diet is beneficial for everyone?

A: No, because we did not evolve to be gluten free; gluten was introduced into our diets over twelve thousand years ago. In recent years, as people start to live longer, various diseases seem to occur in elderly people rather than in young people. As I mentioned, a low gluten diet may increase the risk of various diseases, such as heart disease because whole grains are cut out of many gluten free diets. The trend for people to eat gluten free is just a trend. The diet has received a lot of good press because it may save people's lives who have Celiac Disease, but I do not think it is appropriate for everyone. It is low

in fiber, low in vitamins, there is potential for it to be high in heavy metals. In my opinion, the best is a diverse diet containing foods from every food group.

10. Q: If someone believes that they have Celiac Disease, what is the proper procedure they must follow before being tested?

A: To be tested for Celiac Disease, one must eat a diet that contains gluten and one must have blood tests done. If the blood test comes back positive, currently the gold standard is to have a biopsy. It is reasonable for people with have negative antibodies to have a biopsy anyway, because sometimes we see people have negative blood tests. Since this is a lifelong diet, I think the diagnosis should be very well founded. When you tell someone to go on a gluten free diet, it involves a major change in their lifestyle, so I don't think it's fair to tell someone to do that unless it is really necessary.

11. Q: What is the difference between having Celiac and having a wheat allergy?

A: A wheat allergy is very different than Celiac Disease, which is also different than having a gluten sensitivity. A true wheat allergy is when someone gets hives, or itches, or their throat closes up, or are in an immediate allergic response. Celiac Disease is a slow immune response and most people don't get any immediate reactions (however some do). Then there is also a group of people who are gluten sensitive, who don't have Celiac or a wheat allergy. They report symptoms when they eat wheat, and feel better when they take wheat out of their diet. We don't know as much about that group because it is a heterogenous group of people with multiple different conditions.

12. Q: Should someone who believes that they have a gluten sensitivity go on a gluten free diet before seeing a professional?

A: We would advise people not to do that because going on a gluten free diet would make it hard to diagnose Celiac Disease. Then after a while people don't know what to do because they only sort of got better, so they are not sure whether or not to stay on a gluten free diet.

13. Q: Can a gluten free diet be beneficial for someone with IBS?

A: Yes, there appears to be a subset of people with IBS , but without Celiac Disease, who respond to a gluten free diet. We would rather call this a wheat sensitivity instead of a gluten sensitivity because there are other proteins apart from gluten that could be causing the condition.

Interview 3:

14. Q: If a child gets diagnosed with Celiac Disease, should their parents and siblings get tested as well?

A: We believe they should, and that is actually a bit controversial. About 25% of children in the Celiac Disease center were picked up through being screened, and most screenings involve family members. So, I personally believe that if you have Celiac Disease, it is advantageous to be diagnosed through a screening and then go on a gluten free diet. The controversy about it is that it has not been shown to benefit people

who are asymptomatic. However, after being on a gluten free diet for some time, many asymptomatic people report that they feel better in many different ways.

15. Q: In your opinion, does the timing in which gluten is introduced into an at risk infant's diet affect their long term Celiac Disease risk?

A: The timing in the first year does not appear to make any difference, and that is based on a few studies. One study that gave small amounts of gluten early on in an infant's life, as allergists proposed, did not show any benefit to their long term Celiac Disease risk. In another study, two groups of children were examined, with one group getting gluten at six months and the other at twelve months. It was found that the differences in time made no difference in the child's long term risk, but rather it was the strength of the genes that wholly affected the the risk of the child getting Celiac Disease. There is also some evidence that supports the idea that it is the amount of gluten given in the second year that might be important. What we would advocate now is that gradually as per the pediatrician's instructions, parents introduce wheat into an at risk children's diet after six or seven months. Later in the child's life, their diet should be regulated so that they are not consuming excessive amounts amounts of gluten.

16. Q: Do you believe that the great quantities of gluten in wheat or the increased amount of gluten in processed food, and therefore people's increased consumption, is the cause for the increase in people getting diagnosed with Celiac Disease?

A: We are not sure why Celiac Disease has increased by 5 fold in a 50 year period, but there is evidence that the increase is leveling off now. We do not think it is due to the amount of gluten consumed because wheat consumption in the last century was actually less than the one before, and the amount of gluten in wheat has not changed - that varies by the rainfall. Today, there is a fairly great importation of vital gluten, which is purified gluten, that was actually developed to be added to inferior flour. Cheaper flour had less quantities of gluten, which did not make as quality bread. As a result, gluten was added to many products- such as when you buy a bread machine, apparently they give you a bag of gluten to make the process faster - so we do not know how much added gluten there is in all foods. I personally do not think the increase in Celiac Disease is due to more gluten consumption, I think it is rather due to environmental factors and the cure of diseases, such as infections. There is a study that examined people on the border of Finland and Russia. It was found that these two groups of people have the same genetic makeup, however, Celiac Disease is much more prevalent in Finland than in Russia. In Finland there is a very high standard of living, wide use of antibiotics, processed food, etc., while in Russia, the standard of living was much lower. It is as though people who are exposed to more germs are actually healthier than people who constantly use purell, or wash their hands.

17. Q: You conducted research regarding Celiac Disease and the caregiver burden (such as depression or anxiety) and found that indeed there is a correlation between the two. More specifically, there is increased risk of depression and anxiety in caregivers of

patients with Celiac Disease. What do you believe a caregiver of patient can do to alleviate some of this tension?

A: We are not quite sure why people get anxiety or depression, but what that study shows is that the influence of the disease is not only on the patient but on the family. This, in my mind, is a reflection of how life changing a gluten free diet can be. I think getting assistance with a gluten free diet and getting counseling might help individuals; and I think it is important that healthcare providers are aware of this kind of relationship.