Q&A with Annick Desjardins

Interviewed by Joelle Seligson

When neurologist Annick Desjardins first heard about an experimental therapy that uses the polio virus to attack cancer cells, she admittedly thought it was an off-the-wall idea. In the 12 years since then, however, Desjardins—now associate professor of neurology at the Duke University Medical Center in Durham, North Carolina, which is hosting the study—has seen remarkable results. The CBS show *60 Minutes* even described the treatment, a form of immunotherapy, as potentially a "big leap forward" *(www.cbsnews.com/news/polio-cancer-treatment-duke-university-60-minutes-scottpelley).* In advance of her keynote address at the 2015 ASTC Annual Conference in Montreal, Quebec, Canada, this October *(conference.astc.org)*, Desjardins spoke with *Dimensions* about scientific breakthroughs and how to share them with the public.

Annick, how did you become involved with the study that was featured on *60 Minutes* earlier this year, and what were your first thoughts when the idea was introduced to you?

I first heard about the study about 10 years ago, so in 2003, when it was it was still in the laboratory, and that's when I joined the Duke Brain Tumor Center, in 2003. So I knew we had great results in the lab, and we were just waiting to get all the toxicity studies with the animals to make sure that we could move it forward into humans. So I arrived at the brain tumor center in 2003. In 2012, when finally we were ready to open the study in humans and starting treating patients with the modified polio virus, at that time I was director of clinical research for the brain tumor center. So I took over the study, since I'm in charge of the clinical research, and I've been involved since then. What did I think when I first heard about it? I must say that in 2003, we thought it was a little crazy and, you know, it was a different idea that we were not sure about, but as the data were coming in in the animals, we knew that it was looking really, really interesting. And then we started—by the time we opened the study in 2012, we were really excited because we had seen the data in animal models. We were really, really excited to finally bring it to our patients.

So just briefly in laymen's terms, how does the process work?

So the polio virus itself is able to attach to a receptor that is present on all the cancer cells, all the solid tumor cancer cells. So it attaches—it's a little bit like a lock-and-key phenomenon, where there is this lock on the cancer cells and the polio virus has this perfect key for that lock. Of course the problem is that the polio virus not only attaches and not only opens that lock that is on the cancer cells, but also has this ability to attach to normal cells. So the polio virus was modified to make it

benign so it will not attack the normal cells of the body but will continue to attack and infect only the cancer cells. So that's how the polio virus was modified. What we do is, so we modify the polio virus to make it, again, benign to the normal cells, and what we do is, when a patient has one glioblastomic tumor—so right now we're treating only patients with glioblastoma. So when patients have one glioblastoma tumor that comes back after standard surgery, radiation therapy and chemotherapy, when one tumor comes back, then we're able to put a small tube, a catheter, into the tumor. And then inject directly into the tumor this modified polio virus. And so we inject the modified polio virus during six and a half hours, and then after that it starts to infect the tumor cells, starts killing the tumor cells, and then triggers the immune system to wake up and go attack the cancer cells.

That's incredible. *60 Minutes* described the study and your team's work as potentially a "big leap forward" for cancer treatment. How do you view your research and its results so far?

I think that the world of immunotherapy—so this is considered an oncol virus or an oncolytic virus, different ways of calling it, and it's also part of the immunotherapy because it wakes the immune system to go and attack cancer instead of using poisons or radiation like chemo and radiation therapy are. I think that the whole world of immunotherapy is very, very encouraging, and finally there is a lot of different therapies, so different vaccines, different drugs, what we call checkpoint inhibitors, and then the oncol viruses that we are now able to use to attack the cancer cells. So I think that it is very, very encouraging, the world of immunotherapy, and I think that the modified polio virus—our trial is clearly showing success, clearly we are excited with the results, and it will have a place at some point in the treatment or in the use of immunotherapy to treat cancers.

Since the *60 Minutes* piece aired, what has that time period been like to you? How has the public responded?

I think that the public has been really excited about the results, very positive. I would say the main thing is we're still not ready. We have had a lot of requests for other types of cancer than glioblastoma, which we are not ready for right now and we won't be ready for probably a couple of years. So but I think everyone is very excited, everybody, we have had a lot of referrals for great patients for glioblastoma, and other patients are looking forward at some point that immunotherapy becomes more available for all the different cancer types.

Has the experience changed your views at all on how we should communicate with the public about medical breakthroughs or scientific discoveries?

I think that—I mean, the experience with *60 Minutes* was a fantastic experience where they were very, very thorough, very professional, and it was—I would say we were probably spoiled because we had an amazing team that listened, that wanted to bring the real message forward and wanted also to make sure that what they said was in agreement with what we felt and showed not only the positives but showed that research and—when we bring new therapies, there can be some negatives. So I think that it was just—we were very fortunate because we worked with a great team and they really listened to our feedback and were able to translate that in a very great way for the patients and for the public in general.

So if, say, a science professional or medical research isn't blessed with that kind of great and very thorough team, do you have any advice to them as to how to communicate these sorts of discoveries?

I think that just being honest, that's the answer. I don't think that we are at the point that we have a treatment that will help everybody, and we have to—we're moving forward and having therapies that are better designed for specific patients, and just being honest, I think that's the important, is being honest, talking about the positives but also making sure that people are aware of also the negatives. I think that's the most important part.

Right. OK, so what's next for the clinical trial and for you personally?

I think that really what's next now, we are working on finalizing—we are still enrolling in our phase one clinical trial, we found what we think will be the optimal dose, so the dose that will help the most patients and be safe and successful. And then the next step is really working on getting open a phase two multicenter trial so that we will be able to bring the therapy—because the next step is really to be able to prove that the result that we observe at Duke will be able to be replicated by different institutions. And that's what we're working on right now, so that in the next year or two that we're able to open this to a multicenter trial.

Is there anything else you want to share with ASTC readers as to what you'll discuss at the conference or what you think they should know?

I think that really what we will talk about is the fact that just the amount of work necessary to bring a therapy out like that, I think there was a lot of, many years of work by a lot of different team members to be able to—by Dr. Gromeier and his team in the lab, Dr. Bigner, and after that the team taking care of all the regulatory aspects to get the approval by the CDC [Centers for Disease Control and Prevention], the FDA [Food and Drug Administration], to bring this therapy forward, the NCI [National Cancer Institute] was thoroughly involved. So bringing the different—discussing all the different steps that we need to go through. And then

after that the next step is really how to work together, and I think that one of the main reasons why we have been really successful is the fact that we meet, the people from the lab and the people from the clinic, we meet every week, we review the data together, we discuss and the trial over a time, over the last three years—so we treated our first patient in May 2012. Since then, the protocol has been adjusted and reworked by the discussion that we have on a weekly basis to be able to make it adjusted to be able to have more patients. So I think that's communication. Working together as a team and adjusting what we're doing.

So you'll talk about the internal communication within the team and then also the external communication with the public?

And then the external communication with the public. So that part, yes, absolutely, how do we bring—that's something that we're learning also, but how do we bring exactly the information forward, how do we make sure that people really understand what is going on, how do we—so yeah, absolutely, we will talk about that also.

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