Welcome to the Cell Therapy Bioprocessing and Commercialization podcast series. Today we are speaking with Dr. Julie Allickson, Director of the Regenerative Medicine Clinical Center, Wake Forest Institute for Regenerative Medicine and Wake Forest School of Medicine.

Where do you see the biggest challenges facing regenerative medicine developers over the next five years?

Julie: I think there are several different challenges, but when I really try to add those up I feel that there is a lot that we need to develop yet to get a robust manufacturing process. I think there is a lot that goes into making sure that the product is safe and meeting all the requirements for the regulators. But also, as we are looking at scaling up, scaling out the products, I think that there are a lot of efforts that we still need to put into that.

The other piece would be looking at automation and really pushing the automation to decrease what I’m going to say is the “human factor”, which can bring error and, actually, it would be much more timely. So, I think that the field really needs to push for the automation to be able to get more of a robust manufacturing process.

We actually just published a paper in February in stem cells translational medicine with Josh Hunsberger as the primary author, but really looking at the roadmap for tissue engineering and regenerative medicine in the manufacturing space. I believe that that’s definitely one of the challenges, but I think, also, we have challenges in clinical trial design.

There is a lot of failure – I would say – in clinical trials as we are learning, but I think it is getting better. As we nail down the appropriate patient populations, we’re not so broad and incorporate control groups and also really being thoughtful as we are looking at the end points in clinical trials. It is very critical as we’re selecting what matches up with the potency of the product. I think that’s definitely key.

Then, I would say third would be regulatory considerations. As we move forward, we know it’s really a new paradigm – regenerative medicine – in healthcare and I think that gives us the opportunity to be able to voice our concerns, educate the regulators so that they really understand what we need.
So, I think it is definitely communication, educating the regulators and I think that the more opportunity that we have to facilitate those discussions, the better place that we’ll be in because there is such an opportunity for healthcare if we can accelerate the commercialization of some of these products.

How can pharma companies that are developing regenerative medicine therapies benefit from learning the academic model for translation of regenerative medicine?

Julie: I think that’s a great question and I think that big pharma industry is really now looking at the importance of partnering with academia. There are a lot of components that you wouldn’t be able to get in big pharma without putting a lot more effort and money into that.

As you see, a lot of the academic centers have these translational teams where they incorporate this multidisciplinary group of scientists. They have the basic research, but yet they also have the facilities to be able to incorporate what we would call “good laboratory practice studies” that will be used as a definitive study as we move the product or technology to first demand. So, I think that that’s very important.

I think it might save money as we couple with academia and industries and, typically, if you’re in a translational center, everything is in close proximity. You’ve got the same scientists, possibly, who have developed that technology who are included throughout the process. So, pretty much at our center when we are looking at a technology, we get everybody around the table. You’ve got the PIs, the process development, you’ve got quality and manufacturing and, most important, you’ve got the clinicians. So, you’re going to know from proof-of-concept what that final product is going to look like and you can take the efficient steps to get there. I think as we move forward to try and accelerate to commercialization I think it is important to look at a team effort between pharma and academia.

The other thing is, in academia there is a little more focus on the sliding scale as we look at product characterization and complying with the manufacturing practices. Big pharma is typically used to being compliant from the get-go. I think that takes a lot more effort and we definitely want to reduce the risk. We want to produce a safe product, but I think that we need to --- as we negotiate and we have the DIND, there are certain components in there that are required and certain things that wouldn’t be.

So, I think we also have to pay attention to that and that’s something that pharma could learn from academia as we scale it up. If there is a team effort early on, it could be beneficial because the expertise from both sides would be used to be able to translate that technology.

Moving forward, what are the largest hurdles that regenerative medicine developers face during regulatory approval?

Julie: I think that there are a couple of considerations. I think that one of them is really as we look at the animal models. We are really challenged with that. I mean, looking at immunological responses in the animal model and whether we use an immune competent animal or how we administer the cells across species or if we are
going to use the animal cells. That’s a huge challenge. There is a lot of ongoing effort right now looking at how we can produce maybe a small --- for instance, body in a (inaudible 06:46) is one of the projects that we’re working on where you’ve got these miniaturized organs that are connected through microfluidics and potentially would be able to simulate the human body so that – we’re hoping in the future – some of those different types of technologies could be used in place of the animal model. But I do really think we are challenged as we look at small and large animal models and whether we look at several species as we move to first in man. I think there is a lot of challenge there to really simulate what’s going on in the human body. So, I think that we have a lot of potential to work on that space.

I also think a huge challenge is looking at the potency assay. The potency assay is required by Phase III in a clinical trial, but you really need to understand that and start thinking about your plan at Phase I because it really is relevant to the mechanism-of-the-action. You’ll be able to appropriately assess the efficiency of the data by really understanding the potency. So, that’s a huge challenge for people to really put that in place. Part of the reason is because we are challenged to understand the mechanism-of-the-action with a lot of the therapy. I think that’s huge.

Then the regulatory path. Really helping to streamline that with the regulators because we know that they really want to look at zero risk and we really need to be able to balance that more so that we can look at the benefit vs. the risk. We certainly want the therapies to be safe, but we also know there are huge financial considerations if regenerative medicine were to accelerate and be able to treat potentially some of these different diseases. Even like hemophilia. So, maybe a patient pays $200,000 a year in costs for treatment. If the patient could get a gene therapy that could last forever, it would be a huge financial consideration. So, I think the regulatory pathways are definitely a challenge, as well.

In your opinion, what are the key differences in the regenerative medicine industry between North America, Europe and Asia?

Julie: I’m going to go back to regulations. I feel like regulations are every step of the way. You have to understand them. You have to be able to work closely with the regulators and educate them. There is a fairly big difference as you’re talking about the different spaces.

As we are looking at Asia, you definitely have some advantages in the Japanese market as they implemented the new regulatory considerations back about a year and a half ago where either a larger Phase I or Phase I/II with safety data and some efficacy data – if it’s strong enough – that you’d be able to move it forward and commercialize that with reimbursement as they are doing post-marketing assessment.

There may be considerations for the US to be able to meet a little bit closer to that, but I think there is a huge gap between North America and Asia.

As we look at Europe, there are definitely differences in regulations. Some of the regulations are more rigorous – maybe associated with manufacturing and how we produce the products. So, I think that there are a lot of similarities, as well, between the EU and the US. But, definitely as we look at Asia and the new regulations
through Japan, there is definitely a huge gap and it really would be efficacious if we could look at how we might be able to harmonize and come a little bit closer together on the regulatory considerations with different countries.

What are you looking forward to most at this year’s meeting?

Julie: I’m really excited to attend the meeting. I think there are a lot of great sessions, which are really all strongly focused on translating regenerative medicine in commercialization. So, I think it’s a great meeting to be able to network and learn about that and potentially bring academia, industry and big pharma closer together as partners. I think, overall, that’s really going to be a benefit for the field.

I also enjoy networking as I’m sure I’ll get to meet new faces and new people in this space. I’ve been in this field for 25 years. I started out in bone marrow transplant and then moved through to regenerative medicine and now building tissues and organs in the Regenerative Medicine Center. So, I do know a lot of the people. I was one of the Founding Members of the International Society of Cell Therapy, but I think this is a whole other group that brings in the business, the regulatory and a lot of other components. So, I’m really excited to be able to attend and I think there will be a lot to learn.

So, it will definitely be advantageous for people to attend the meeting. I’m really excited.

IBC’s Cell Therapy Bioprocessing and Commercialization Event will take place September 30 through October 2nd 2015 in Alexandria, Virginia.

If you have any questions about this Event, feel free to reach out to me at rgeswell@jiirusa.com

Thank you.