Macular Chats

Understanding Stem Cell Research for Macular Degeneration
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Transcript of Teleconference with Jeffrey Stern, MD, PhD and Sally Temple, PhD

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Please note: This Chat has been edited for clarity and brevity.

DR. JIMMY LIU: Hello and welcome! My name is Dr. Jimmy Liu, and I'm the Director of Vision Science Programs at BrightFocus Foundation. I am pleased to be your host for today's Macular Chat, "Understanding Stem Cell Research for Macular Degeneration." Macular Chats are a monthly program, supported in part by sponsorship from Genentech and Regeneron, designed to provide people living with macular degeneration and the family and friends who support them with information straight from the experts.

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BrightFocus Foundation's Macular Degeneration Research Program has

supported over $56 million in scientific grants exploring the root causes and potential prevention, treatment, and cure of macular degeneration, and is currently investing in 44 active projects across the globe.

Now, I would like to introduce today's guest speakers, Dr. Jeffrey Stern and Dr. Sally Temple, who are co-founders of the Neural Stem Cell Institute, where Dr. Stern is the Director of Translational Research and Dr. Temple is the Scientific Director. Together, they discovered a subpopulation of stem cells in human retinal pigment epithelial cells, or RPE. Through their research programs at the Neural Stem Cell Institute, they seek to understand the role of stem cells in central nervous system development, maintenance, and repair. Working together, they are helping to develop a stem cell–based therapy for age-related macular degeneration that is currently in a clinical trial. Thank you for joining us today, Dr. Stern and Dr. Temple.

DR. SALLY TEMPLE: Pleasure to be here. Thank you.

DR. JEFFREY STERN: Thank you for that very nice introduction, and to Amanda for organizing this call.

DR. JIMMY LIU: Of course. Thank you so much for being on this call. We really appreciate you, and Dr. Stern and Dr. Temple's time. So, let's start with the basics: What exactly are stem cells, and why are they being explored as a treatment for age-related macular degeneration, or AMD?

DR. SALLY TEMPLE: Yes, great question. Stem cells are cells with a very unique property that's called self-renewal. And what that means is that you can take one cell, and it's capable of giving two cells, and those two cells can give four cells, and so on. So, you have this possibility of taking the initial stem cell and making, literally, millions of cells from that original cell. And so, you can see how these cells could be really valuable for tissue replacement. And in diseases like age-related macular degeneration, where the retinal pigment epithelium—the RPE cells—are lost, if we can take stem cells and turn them into RPE cells, those cells could replace the cells that are not functioning properly in AMD. So, people are very excited about stem cells and what they can possibly do to replace tissue, including in the retina.

DR. JEFFREY STERN: I would add to that that degenerative diseases, like AMD, where there's loss of cells are difficult to reverse with drugs. The lost or dead cells don't respond to drugs. A replacement therapy is needed. Stem cells provide ample human cells for such replacement therapies.

DR. JIMMY LIU: Thank you so much for that explanation, Dr. Stern and Dr. Temple. As a follow-up question, you all both talked about retinal pigment epithelial cells, or RPE. Can you explain a little bit more about the RPE in the context of AMD?

DR. JEFFREY STERN: The RPE is a layer of the retina that supports the overlying photoreceptor cells and the neurons that transmit the visual signal back to the brain. When the RPE cells are lost in degenerative diseases, such as AMD, they no longer support the overlying photoreceptor cells, so light is not converted into a visual signal. Our strategy is that replacing RPE will rescue the dysfunctional photoreceptor cells so that they can detect light and initiate vision.

DR. JIMMY LIU: Perfect! Thank you so much for that explanation. And the next question that I'm going to ask is a little bit more about stem cells. And I know that you both talked about stem cells and their relationship to AMD, so can you describe a little bit more about how stem cells are used in research, and how do stem cells turn into RPE, and explain to our audience a little bit more about that process?

DR. SALLY TEMPLE: Yes, absolutely. So, there are really two major types of stem cells. One is called pluripotent. That means that it can make any cell type in the body. People might have heard of these pluripotent stem cells. Actually, the person that developed it got a Nobel Prize for this work in 2012. That's Dr. Shinya Yamanaka from Japan. This was an amazing invention. You can take a blood cell or a skin cell from a patient and then have those cells reprogrammed back into a state where instead of just being a regular skin cell or a regular blood cell, they become pluripotent and able to make any cells in the body. This is an extremely powerful technology. And in order to take these cells that can literally make any tissue and have them make retinal pigment epithelial cells,

the cells we care about for repairing the RPE layer in AMD, those cells have to be grown in a very special way. They have to be treated with small molecules and growth factors that help to channel them into just making RPE cells. And that's quite a tricky process, and it can take weeks to months to do it, but there are now labs across the world who have accomplished this, and these pluripotent stem cell–derived RPE cells are also in clinical trials now.

The second type of stem cell is sometimes called adult stem cell or tissue-specific stem cell—I like that term because it really describes where they are. So now, probably about 10 to 15 years ago, Dr. Stern and I discovered that there was a stem cell in the retinal pigment epithelial layer in the eye—in the human eye—and we're just very grateful to families and patients who donate eyes for research, because this is super helpful and without it, we would never have made this discovery. So now, we know that there are adult RPE stem cells in the eye. We can take that eye tissue and culture those cells and grow them out, and they make millions and millions of new, fresh retinal pigment epithelial cells, the RPE cells. And so, now, we are clinically testing these in a clinical trial that Jeff is helping to head up with a clinical team. So, those are the two main types—pluripotent and adult—and we're excited to see what can be learned about them and how they may help patients.

DR. JEFFREY STERN: One additional point to build upon what Sally said, which was that for the first time in the history, stem cell technology provides a means by which we can create large numbers of cells for study in the laboratory or for clinical implementation. Because the stem cells, both pluripotent stem cells and adult stem cells, self-replicate—in fact, stem cells are defined by the ability to self-renew, that one cell makes two and the two make four and so on—this gives us access, again, for the first time in history, to create large numbers sufficient to treat patients of a particular cell type. And our focus, of course, is on the RPE stem cell and the progeny, the daughters that come from that RPE stem cell. For replacement therapy, one donor eye creates thousands of doses.

DR. JIMMY LIU: Wow, that's such a great explanation about how stem cells are used in research and in therapies, Dr. Stern and Dr. Temple. It's

really exciting that stem cell therapy can be such a promising treatment option for AMD. Another question that I have is that a stem cell therapy that is currently in clinical trials right now is Luxa Biotechnology's RPE cell therapy for dry AMD and geographic atrophy. Can you all explain to our audience what dry AMD and geographic atrophy are and how this therapy works at Luxa Biotechnology?

DR. JEFFREY STERN: Dry AMD, as we've mentioned earlier, is defined by a loss of RPE cells that gradually die as we age. And in more advanced cases of dry AMD, patches where all the RPE cells are lost emerge, and they're well-circumscribed lesions in the macula that we target with our replacement therapy. These geographic atrophy lesions are fairly small, and that gives a benefit for the therapy that requires only a few RPE cells to replace those that are lost.

DR. JIMMY LIU: Perfect! And as a follow-up question: Can you all talk about Luxa Biotechnology's cell therapy for dry AMD and geographic atrophy and how the therapy works?

DR. JEFFREY STERN: The therapy works by implanting RPE cells under the macula to replace those that are lost due to dry AMD. We are studying two groups of patients we term the better-seeing group and the worse-seeing group based on their baseline visual acuity. So, patients who are legally blind and worse than that from advanced dry AMD are eligible, and patients that are in the middle of the process—that are losing their reading vision, losing their ability to drive, still in process—are also eligible, and we're studying those two groups separately. Luxa's clinical trial is termed a dose-escalation safety and tolerability trial. So, only 11 patients have been treated so far. The first low-dose cohort of subjects has been recently published, with marked improvement in visual acuity, surprising improvements in visual acuity. We are in the middle of the intermediate dose of RPE cells, of 150,000 RPE cells, currently, and hope to complete the final cohort of high-dose 250,000 RPE cell transplants this year. And again, we all want to know about how effective it is at improving vision—that's our goal, that's the dream. And the first step in the Phase 1 clinical trial that is overseen by the FDA and other regulatory authorities is to determine safety first. And so far, more than midway through the trial, we

have not seen significant safety signal emerge. So, we're very excited for the next stage of the trial.

DR. JIMMY LIU: Wow, that's incredibly exciting, Dr. Stern! That's really awesome to see such positive preliminary results for your cohorts in the trial. As a follow-up question: For your therapy, and actually for stem cell therapies in general, how many times would a patient have to receive the treatment?

DR. JEFFREY STERN: The dose that we chose to explore, the low dose of 50,000 cells implanted, was based on how many cells are lost during natural progression of dry AMD. And the dose of 50,000 cells targets a decade or two of dry AMD progression. So, although we don't know the answer at this time, we believe that a single treatment will counteract a decade or two of dry AMD disease progression.

DR. SALLY TEMPLE: Yes, the goal here is a one-and-done therapy. But it might be possible to come in with another dose, if, for example, it was required.

DR. JIMMY LIU: Thank you so much for providing that information. Another follow-up question that people may be wondering is: Who is eligible for this trial, specifically, at Luxa Biotechnology?

DR. JEFFREY STERN: The basic requirement is having a history of dry AMD, of course. And we have certain visual acuity guidelines—so, 20/70 to 20/800 visual acuity is another inclusion criteria. And there are exclusion criteria, as well, such as a lack of wet AMD, age has to be below 80 years. The specific inclusion and exclusion criteria can be found on ClinicalTrials.gov or by contacting Luxa Biotechnology at info@luxabiotech.org.

DR. JIMMY LIU: Perfect. And are you all still accepting people for this clinical trial?

DR. JEFFREY STERN: Yes, we are. As I mentioned, we've treated 11 subjects to date, and the trial total is 18 subjects. So, we're just completing the mid-dose cohort, and we'll be starting the high-dose cohort in a few months' time. We're recruiting subjects at three locations. Most of the

early treatments occurred at the W.K. Kellogg Eye Center at the University of Michigan with Dr. Rajesh Rao as the principal investigator. And a few months ago, we opened two additional clinical sites, one at Stanford University in California and the other at LA Retina, a large practice at Cedars-Sinai Medical Center in California.

DR. JIMMY LIU: Perfect. And then another question that I have is: Can people who are interested in enrolling in this clinical trial, can they enter this trial if they had already enrolled in another research program?

DR. JEFFREY STERN: Yes, as long as the time from their last experimental treatment or the therapeutic trial is greater than 6 months. So, for example, complement factor inhibitors recently completed their trials, and those subjects, those patients would be eligible for our trial.

DR. JIMMY LIU: Perfect. And then lastly, another question that I have is: Will this therapy work for the same people, for all demographics?

DR. JEFFREY STERN: That's a great question. The truth is, we are uncertain at this time which dry AMD patients are best indicated for undergoing RPE stem cell implantation. So far, it appears patients with worse vision gain the most after treatment, but there may be other factors, such as how much atrophy of the overlying photoreceptor cells has occurred. And part of the safety and tolerability study that is ongoing will aim to identify the correlating factors between vision gain and baseline characteristics of the patient.

DR. SALLY TEMPLE: I would say that you hit on a point that's really important to us, and our goal in developing this candidate therapeutic was to be able to treat, as broadly as possible, people in different demographics. And so, as the trial goes on and more people are added, it's something that we really want to pay attention to and make sure if it is helpful, if it is safe, that it is widely accessible.

DR. JEFFREY STERN: So far, we have not seen vision loss, and some patients gain more vision than others, and we're keenly interested in identifying who has great gain versus moderate gain in vision.

DR. JIMMY LIU: Perfect. Thank you so much for that response, Dr. Stern and Dr. Temple. Another follow-up question that I had is: I know you all have three enrollment centers for the Luxa Biotechnology clinical trial. So, once someone goes to one of those centers and they're interested in enrolling, what happens next?

DR. JEFFREY STERN: Well, the trial has a formal screening process to check the vision, to ascertain that the patient has met all of the inclusion criteria and none of the exclusion criteria so that they can become a subject in the clinical trial itself. I would recommend that the patient's ophthalmologist or retina specialist perform an exam first prior to coming to either Stanford, LA, or University of Michigan for more formal screening, which can take half of a day. So, we study the patients very carefully before enrolling in the trial.

DR. JIMMY LIU: Thank you. And another question that I had: Moving on in terms of the general scope of stem cell therapies, are there any other notable trials or companies making progress in the stem cell therapy space that the patients or family members on this call should be aware of?

DR. JEFFREY STERN: Yes, there are a few studies using pluripotent stem cells to derive RPE progeny that are then implanted for AMD. One of those studies out of the NIH uses what we call induced pluripotent stem cells—so, it takes skin from a patient, grows that into RPE cells to be re-implanted in the same patient. I should add that that is a very expensive and time-consuming trial. Right now, Genentech in the Roche Group has acquired a company, Lineage Cell Therapeutics, that uses embryonic stem cell–derived RPE transplanted for dry AMD. And another company, Astellas Corporation, is also developing an embryonic stem cell—pluripotent stem cell—derived RPE product for treating dry AMD. Now, I want to add something here. There is a lot of hope in our culture right now from stem cell technology that has advanced remarkably, as Sally described, over the past few decades. And that has given rise to less-reputable clinics that will offer stem cell therapy for various ailments that they charge money—it's not proven, it's not a proper clinical study. So, the three that I've mentioned, including one more, Regenerative Patch Technologies in California, are all running proper clinical studies to learn

about safety and efficacy and develop products based on science rather than profit. I don't know, Sally, if you want to add more about the ways we can battle stem cell tourism, which is occurring around the world. I think the first signal to the audience should be: If they're asking for money, don't go. Sally may have more.

DR. SALLY TEMPLE: Yeah, no, right. I agree. There are pluripotent stem cell trials going on—multiple in this country and also in other countries. I think that there are probably around 12 good trials ongoing right now around the world, and so we're going to learn a lot more about how RPE replacement can benefit patients. And so, many of these, they produce news articles. We could just follow along and see how they are. Just to add to what Dr. Stern said, there are two major ways of delivering the retinal pigmented epithelial cells. One way is to put the cells in as a cell suspension—that's the approach that we have taken and Lineage Therapeutics has taken, as our approaches actually grow the cells in a little patch and then inject that patch under the retina with a specialized device ... Regenerative Patch Technologies, and also Dr. Kapil Bharti's trial at the National Eye Institute. And so, when contemplating or looking into the results from these different trials, it's important to know if the approach is to inject the cells in a suspension or to grow them on a patch.

And I would just also second Dr. Stern's point, is that it is really important to check out ... if you're contemplating this, just to check out that this is a legitimate trial, and the International Society for Stem Cell Research, ISSCR, they have issued guidelines that are written for patients, and they are available at the ISSCR website. They help identify the sorts of questions you should be asking to make sure that the trial that you are learning about is really legitimate.

DR. JIMMY LIU: Perfect. Thank you so much, Dr. Stern and Dr. Temple. It is incredibly important to know about those specific clinical trials and whether it is safe and efficacious for people to enter them. And as a follow-up question, Dr. Stern and Dr. Temple, I know that you both discussed the different stem cell therapy treatments that are out there besides Luxa Biotechnologies. Are any of those stem cell treatments available to treat wet AMD?

DR. JEFFREY STERN: There are studies that are less advanced than the ones we've mentioned, where the wet part of AMD, if you will, can be removed and then the RPE implanted. And there was one recent publication that suggested this is a very promising approach, but it's in an earlier stage of development.

DR. JIMMY LIU: Thank you. Another question that I have is: What are the biggest challenges researchers and clinicians still face in making stem cell therapies widely available and effective for patients with AMD?

DR. JEFFREY STERN: Well, other than learning the results, the effectiveness and safety of these treatments, there are very practical issues that slow the progress. Manufacturing expenses, manufacturing processes, and protocols can be burdensome. This is a new technology. The FDA is working hard to learn how to regulate the manufacturing and delivery of these cells so that no harm is done, but that's expensive at this early stage, where we may have to go through 10 different checks for each product, each dose that we produce in order to meet stringent guidelines provided by the FDA, which we believe in at this early stage. I believe stem cell therapy is just, over the last 10 years, emerging as a very exciting and promising direction for new medicines. And at the beginning, we need to be careful. We need to go slowly.

DR. SALLY TEMPLE: Yeah. I agree with that. You know, this is really a new frontier, a new modality. I think everyone knows about small-molecule drugs, antibodies, like anti-VEGF therapy that's been so important for people with wet AMD. So, biologics, small molecules biologics and cells are really a new frontier, and although we are at the beginning and we're all learning about how to manufacture them and how to ensure that products are reproducible, safe, and effective, there are a lot of research labs and a lot of companies also participating in this and pushing the field forward. And so, we've seen a lot of gains in these areas, and I'm sure that more will be coming. It's really an area of growth, and good achievements are being made along the way.

DR. JIMMY LIU: Perfect. Thank you so much, Dr. Stern and Dr. Temple. I want to switch gears to the role patients and caregivers play in advancing this research, especially stem cell research. What are the roles that

patients and caregivers play in advancing stem cell research, whether this is through participation, advocacy, or education?

DR. JEFFREY STERN: Well, first, I'm going to answer your question indirectly to say thank you to BrightFocus. I think it was a decade or more ago that BrightFocus provided us the grants, funding, and support needed to discover the RPE stem cells, so thank you very much. And of course, more funding is needed. I was caught by surprise with the current administration cutting the NIH funding. Hopefully, that will bounce back. We need people, we need equipment, and we need supplies to progress as quickly and safely as possible. I hate to say your congressmen. I think the congressmen are supportive. We have to get the NIH back up on its feet, which has been the main supporter of our work. And caregivers can help the patient through life. The gift of sight, right, and having a loss of central vision can be very limiting, and to research which treatments to pursue, which trials are good, to come for the screening visits, to live life. Caregivers are essential for care of patients with AMD.

DR. SALLY TEMPLE: I would add to that I have also some personal experience because my mom had AMD, and so I really learned firsthand from our family how much that impacts one's life. That was a very big, really, motivator for me to get involved. Jeff has patients, so many patients that he can't help, but together, we decided that this is something that we really wanted to research into and develop new therapies. And this is because you have the patients, the caregivers have the real-world experience. And I absolutely agree with Jeff. It's very important to hear that voice and to tell people who are making policies about research, about therapy development, how crucial it is to be able to work and improve this very prevalent disease. One in five people over age 75, that's a big number, and we really need right now to be working on these new therapeutic approaches and figure out how to make life better for everyone involved.

DR. JIMMY LIU: Yes. Thank you so much, Dr. Stern and Dr. Temple. It is really important to know that funding for research ... not only does BrightFocus fund research in macular degeneration, glaucoma, and Alzheimer's, but also all entities, government and nongovernment.

It's important to fund this research in order to get these cutting-edge, innovative therapies to patients as soon as possible so we can help save their sight or their mind. And so, another question that I have is: Is there anything you'd like to share with patients who are feeling hopeful but also slightly cautious about stem cell therapies?

DR. JEFFREY STERN: I think "hopeful and cautious" is appropriate at this time. The technology in biology has burgeoned over the past few decades. It's equivalent to the rotary phone transitioning to these complicated smartphones that we have now. We're able to do so much more, and I think that the effective safe treatment should be in our hands yesterday, and we all want it right away. We're proceeding quickly, as safely as possible. It's working at earlier stages. There's great hope—it's real hope—emerging. We may be disappointed, but everything is pointing in the direction that we'll have more effective treatment, at least for some AMD patients, in the not-too-distant future. The companies that are working on PSC-derived RPE are a little bit ahead of us, so they're in their Phase 2b, as it's known, so the FDA is in the middle of getting the drug approved. And we're a year or two away from that ourselves; 3 to 5 years seems a reasonable timeline to expect a final answer, if you will, about safety and efficacy for these treatments. It's the most exciting time, not just for AMD, but for many diseases, but caution is needed. These are new therapies.

DR. JIMMY LIU: Perfect. Thanks so much, Dr. Stern. I have several listener questions. A lot of people are very interested in stem cell therapy and Luxa Biotechnology's clinical trial. One question that I have from one of our listeners is: Why is 80 years old a cutoff for eligibility? And in general, how is the age cutoff determined for clinical trials?

DR. JEFFREY STERN: It's an utterly practical cut-off, and it's not for the entry into the trial, it's for the eye donor of the source for the cells that we're transplanting. I may not have said that clearly enough earlier. We found the RPE stem cell is still active in 90-year-old donors, eye donors, but we felt that given comorbidities that tend to accumulate over time, it would be safer to limit the eye donor age to be 80 or less. Over 55 years of age is another requirement that defines dry AMD. We're not looking

at juvenile macular degeneration yet.

DR. SALLY TEMPLE: So, to be clear, there isn't an upper age limit for receiving the transplant, but there is for donating the transplant. Sorry for that confusion.

DR. JIMMY LIU: No worries. Thank you so much for that explanation. Another listener question that we had is: If the Luxa clinical trial is successful—this may be a tough question to answer—when do you all expect FDA approval?

DR. JEFFREY STERN: Well, that would be a success of the trial, and there are three phases to the FDA clinical trial runway: Phase 1, Phase 2, Phase 3. Phase 1 is all about safety. Phase 2 is a mixture of safety and efficacy. And Phase 3 is final safety and efficacy. And we're midway through Phase 1/2a, so we're 18 subjects—sorry, 11 subjects—in. We'll be complete this year. Probably another 30 or 40 subjects for Phase 2b; perhaps that will be what we term a pivotal trial, which will lead to final evaluation by the FDA for approval.

DR. JIMMY LIU: Perfect. One more listener question that we had is: In terms of growing the stem cells, how can you control the growth of those stem cells once you take them from the source? And then, how are these stem cells grown and controlled in general?

DR. JEFFREY STERN: Great question. I'm going to pass that to Dr. Temple, Scientific Director.

DR. SALLY TEMPLE: Thank you so much for that question. It's very crucial. So, we've talked about two types of stem cells. One is pluripotent stem cells that can give anything. They also have really huge proliferative potential. In fact, the FDA requires very careful purification of the RPE cells away from those stem cells because they don't want an overgrowth situation where, if there's any residual stem cells in that product, you could get a growth in the eye. Now, I would tell you that of all the pluripotent trials that are ongoing, and there have been many patients treated to date, none of them have had that abnormal growth in the eye, but one has to be super careful. For the cells that come from the adult

eye, the ones that we and Luxa Biotech are working with in our clinical trial, they stop dividing before we put them into the eye, and they do not continue to divide there, and they don't form any abnormal growths. So, I think that this is one of the advantages of using an adult or tissue-specific cell, that it really responds very well to the control conditions and it does stop proliferating, so we don't have to worry about that. I would say that it is something that we are continuing to monitor, obviously, in patients. You want to make sure that what we see in animal studies—no growth of these cells—that that's also occurring in humans. So, what we're seeing is—and what we hope to see—is that the cells will integrate into the RPE layer, they will substitute, but they won't overgrow and make, you know, abnormal growths.

DR. JEFFREY STERN: I would add a little bit to that just to build upon it and say: These RPE stem cells, the tissue-specific RPE stem cells that we use, are present in nature, and their role in nature is to make RPE. And so, an overriding strategy, if you will, is that we harness nature and try to recapitulate what has happened earlier in development to restore the RPE layer.

DR. JIMMY LIU: Perfect. Thanks so much, Dr. Temple and Dr. Stern, for taking such a potentially complicated scientific question and creating it and synthesizing it into layman terms. Thank you so much. The last question that we have is: Where can listeners go to learn more or stay updated on stem cell research for AMD?

DR. JEFFREY STERN: I think BrightFocus is a great resource for learning about AMD, and you have your clinical trials page. I would say at somewhat higher level, more generally, researching stem cell therapies that are under development. The ISSCR website is great. There is enough interest in stem cell therapy that each step forward makes the news. I follow the news to supplement reading medical journals and scientific journals where we see the actual data. Dr. Temple and I go to meetings where cutting-edge results are presented ahead of publication. So, for the audience, I would say the news. Google "RPE stem cell," and you will find progress.

DR. SALLY TEMPLE: Yes, and another site, of course, is ClinicalTrials.gov,

where you will find lists of clinical trials that are ongoing. You do have to be careful, though, because things are posted there on an honor system, so we have to trust that they are legitimate. There is actually a disclaimer at the site, but it can be a good source for searching about RPE clinical trials and stem cells, ClinicalTrials.gov.

DR. JIMMY LIU: Perfect. Thanks so much, Dr. Temple and Dr. Stern, for all the insight that you gave me and the audience today. Again, thank you so much for all the information that you shared with us today. To our listeners, thank you so much for joining our Macular Chat. I sincerely hope you found it very helpful. Dr. Stern and Dr. Temple, before we close, do you have any closing remarks for our audience today?

DR. JEFFREY STERN: Thank you for your attention. Thank you, again, Amanda and Dr. Liu, for organizing and running this call. It's wonderful to be able to share the exciting progress that is being made in stem cell therapies for macular degeneration. And I'd like to thank BrightFocus Foundation again for starting us off down this very promising pathway.

DR. SALLY TEMPLE: Yes, and I second all of that. I just want to thank the audience for all of their interest and continuing to pay attention to this exciting field, and also for the participants in the trials that are ongoing. They really put a lot of effort in to go and do the screening and all the tests that's required. And without participation, we couldn't be making progress. None of the trials that we've talked about could be making progress. So, we're enormously grateful for everyone's interest and participation. And thank you. Thank you all for attending today, and thanks to BrightFocus for really hosting this and having wonderful questions.

DR. JIMMY LIU: Thanks so much, Dr. Temple and Dr. Stern. We at BrightFocus are so excited about funding your research and helping your research to propel into the current clinical trial that's happening at Luxa Biotechnology. So, thank you again for joining us today. Our next Macular Chat will be on Wednesday, November 19. This concludes today's Macular Chat.

Useful Resources and Key Terms

To access the resources below, please contact BrightFocus Foundation: (800) 437-2423 or visit us at www.BrightFocus.org. Available resources include—

- Macular Chats Archive
- Research funded by Macular Degeneration Research
- Macular Degeneration Overview
- Treatments for Macular Degeneration
- Macular Degeneration Resources
- Expert Advice for Macular Degeneration
- Understanding Geographic Atrophy
- Article: Can Stem Cells Improve Vision in People With Macular Degeneration?

Helpful low vision tools or resources mentioned during the Chat include—

- Luxa Biotechnology
- ClinicalTrials.gov
- Lineage Cell Therapeutics
- Astellas Corporation
- Regenerative Patch Technologies

- International Society for Stem Cell Research (ISSCR)
- What Should I Ask When Considering Taking Part in a Clinical Trial?