

Transcript Details

This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: <https://reachmd.com/programs/innovations-in-medicine/overcoming-obstacles-in-regenerative-medicine-with-mrna-therapeutics/14003/>

ReachMD

www.reachmd.com
info@reachmd.com
(866) 423-7849

Overcoming Obstacles in Regenerative Medicine with mRNA Therapeutics

Announcer:

Welcome to *Innovations in Medicine*, sponsored by Moderna. This is a non-certified educational series produced and controlled by ReachMD and is intended for healthcare professionals only. On this episode, you'll hear from Dr. John Cooke, who's the Director of the Center for Cardiovascular Regeneration, and Medical Director of the RNA Therapeutics Program in the Houston Methodist DeBakey Heart and Vascular Center. Dr. Cooke will be exploring how mRNA medicine may help us overcome obstacles in regenerative medicine. Let's hear from him now.

Dr. Cooke:

One of the primary obstacles in regenerative medicine that we're trying to overcome is senescence. Well, of course, that's a primary obstacle in almost any therapy that we're delivering to patients. And in regenerative medicine applications, one of the things we need is we need cells to proliferate. Well, as they proliferate, they undergo replicative aging. So that can be a problem because with aging comes problems. And then in many of the patients that we're going to be working with we're applying regenerative medicine solutions, their tissues are aged. So, one of the major problems we need to overcome is senescence. And senescence has associated with all kinds of cellular problems, problems with the mitochondria metabolic abnormalities, inflammaging, which is the release of inflammatory cytokines. Old cells make a lot of inflammatory cytokines and make the cells around them sick. That's called a senescence-associated secretory phenotype. Proteostasis is also impaired. Proteostasis is the ability of a cell to get rid of misfolded proteins or damaged proteins, and that gets impaired, and then those proteins accumulate. And those protein aggregates can cause, well, among other things dementia in the brain, for example. DNA damage occurs with aging, telomere erosion occurs.

Now, we kind of focused on that last one with an RNA therapeutic and we generated an RNA encoding telomerase with the idea that well maybe if we can restore the telomeres, that maybe we can do some good. And we were very surprised by how well that worked. We've published a few papers now since 2015. We've published a few papers on this idea that we can reverse aging by extending the telomeres. And it turns out that in addition to increasing replicative capacity of the cells, we can double the lifespan of human fibroblasts with this RNA telomerase, we also get an improvement in function. So the cells are able to replicate more, but their functions are improved.

So this is just one example of how one might use RNA to approach a major obstacle for tissue regeneration. And that is replicated aging of the cells and also the senescence that occurs and that is already present in many of the patients with whom we're dealing. So that's an example of how RNA therapeutics can help us.

Announcer:

This episode of *Innovations in Medicine* was sponsored by Moderna. This is a non-certified educational series produced and controlled by ReachMD and is intended for healthcare professionals only. To access this and other episodes in this series, visit [ReachMD.com/Innovations in Medicine](https://ReachMD.com/Innovations%20in%20Medicine), where you can Be Part of the Knowledge. Thanks for listening!