

### 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/emerging-mrna-technology-in-neurodegenerative-disorders-whats-on-the-horizon/14007/>

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Emerging mRNA Technology in Neurodegenerative Disorders: What's on the Horizon?

### Announcer:

Welcome to *Innovations in Medicine* on ReachMD, 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, we'll hear from Dr. Ahmed Obeidat, who's an Associate Professor in the Department of Neurology and Director of Immunology and the MS Fellowship Program at the Medical College of Wisconsin. Dr. Obeidat will be exploring the role of mRNA therapeutics in the treatment of neurodegenerative disorders. Let's hear from him now.

### Dr. Obeidat:

So, one of the concepts in neurodegenerative disease is there is what we call an inflammatory environment around the neurons. So, although these are considered neurodegenerative diseases, but there is still ongoing inflammation that we think, and the environment around neurons, and supporting cells like glial cells, the environment has some oxidative stress, we call it inflammation, free radicals. And then what are the therapies that are trying to address those environments? Those include mRNA therapeutics. So those mRNA therapeutics are trying, in a way, can they turn on some genes or turn off some genes, trying to actually change the environment around the neurons, trying to create an environment that's more favorable to avoid these neurodegenerative ongoing process that's happening. So, this is one of the concepts that currently being looked at with mRNA type of therapeutics.

The other concept that I think is also important is some of the neurodegenerative diseases we think are caused or aggravated by lack of some neural elements or lack of even the neuron transmitters. For example, in Parkinson's disease, there is a lack of dopamine, right? There is a decrease in production of dopamine from specific neurons, that kind of neuro-degenerate and die. So, one of the concepts is, can the mRNA-based therapeutics be able to change, turn on or off, some of the genetic material or some of the genes that are involved in the production of some of these neurotransmitters? And maybe help patients to actually get some of those back in a way, which will be really something that would be ideal and can be implemented.

So, thinking about the future on how can we treat neurodegenerative disorders using mRNA therapeutic strategies, and some other strategies that are affecting directly nucleic acid and neurodegeneration is one of the concepts is think about what we call personalized and precision medicine. And this is one of the topics that I think it's a futuristic topic where we think about a group of patients that have enough similarities in the disease process itself.

So, if we take for example, a group of patients with Alzheimer's disease or Parkinson's disease, and then there are specific biomarkers that are shared among those patients. So this will help us to select a homogeneous group that then will be able to design a study or a clinical trial or clinical intervention using an mRNA-based technique to be able to modify the disease for this group of patients. This group of patients might be small, rather than what we are used to in clinical trials with thousands of patients or hundreds of patients in trials, this group might be 10s of patients. However, there'll be 10s of homogeneous from a disease perspective, homogeneous patients. And I think this is where the mRNA vaccination and strategies that are used as a therapeutic can actually alter those neurodegenerative diseases in the future.

So, when do we intervene? How do we intervene? And then who do we select to get in the studies? And then I think these are many of the questions for the future. And I think the mRNA therapeutics will be an ideal type of therapeutic to actually look at those types of precision therapy in the future.

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