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EDITORIAL ARTICLE

Nanobots for Neurodegenerative Disorders

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Introduction

For over 400 million years *endomyccorhizae* has formed ~80 of terrestrial plant/fungi interactions. During *endomyccorhizae*, bundles of finger like fungal extensions called mycelium (*hyphae*), also known as shiro, penetrate the plant root where they form arbuscules (branching structures) spores and vesicles within the root cell structure. Due to its integrative method mycelium facilitates mineral uptake of potassium, nitrogen, zinc and copper to the plant root, protecting against infection and conferring plant fitness. Another significant feature of *endomyccorhizae* is how mycelium interacts with other soil organisms in a beneficial manner. *Endomyccorhizae* may also lead to anatomical changes in plant root morphology via mycelium colonization. Mycelium colonization can increase plant growth and reduce pathogen invasion [1].

Nanomedicine is a new field of molecular medicine that exploits the ability to control individual atoms and molecules and associated properties, to generate complex functional drug delivery vehicles, diagnostic and analytical tools for application in medicine [2]. "Endomyccorhizae like interface" (ELI) nanocognitive device as a new kind of future neuroprosthetic which aims to facilitate neuronal network properties in individuals with neurodegenerative disorders. The method in which ELI is connected and integrated to neuronal networks is based on a mechanism similar to endomyccorhizae which is the oldest and most widespread form of plant symbiosis. The principle of Endomyccorhizae could be relevant for developing a crossing point between the ELI and neuronal networks.

Similar to endomyccorhizae the ELI is designed to form webs, each of which connects multiple neurons together. The ELI functions to sense action potentials and deliver it to the neurons it connects to. This compensates for neuronal loss in neurodegenerative disorders, such as Alzheimer's disease and Parkinson's disease [3].

Conclusion

Programmable nanomaterials offer great promise to the field of medicine. However, before nanomedicine is routinely integrated into mainstream therapeutics, a variety of key gaps must be addressed [4]. As stated by Sanhai et al., for meaningful and effective translation into benefits for patients, innovation in this area must apply the pillars of evidence-based medicine in parallel with predictive molecular toxicology paradigms that can be built with the aid of systems biology thinking.

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