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## Nanomedicine in the diagnosis and therapy of ALS

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**A**myotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease, is the most common adult-onset motor neuron disease. It is a rapidly advancing neurodegenerative disorder, characterized by the deterioration of both upper and lower motor neurons, with a mean time of survival from onset of symptoms to death of 2–5 years. The pathophysiology of ALS remains poorly understood. The only FDA approved therapy for ALS is riluzole, a glutamatergic neurotransmission inhibitor, with modest benefits on survival. Many other agents have shown promising results in preclinical trials, but have yet to show benefit in human clinical trials. Given the limited therapeutic treatment options to date, the most important approach to improve the patient's quality of life remains symptom-based management. Recently the interest in nanoneuromedicine has grown rapidly due to the immediate need for improved biomarkers and therapies for degenerative nervous system disorders. The advent of nanomedicines can enhance the delivery of biologically active molecules for targeted therapy and imaging. In addition, nanomedical advances are leading to therapies that target CNS pathobiology and as such, can interrupt disordered protein aggregation, deliver functional neuroprotective proteins and alter the oxidant state of affected neural tissues. The work presents the latest contribution of nanomedicine with some underlying new developments in cell based delivery strategies, which could be a promising approach for the treatment of ALS.

### Biography

Lina Machtoub, MD, PhD University of Tokyo Japan, 2002, Director of Neuronanomed ALS Zentrum - BrünstlMedicine. In 2003, joined Max Planck Institute, Germany, after granting a research award from Alexander von Humboldt foundation. In 2006, became visiting scientist at Harvard Medical University, Boston working on several clinical research projects focusing on the development of clinical multimodal diagnostic approaches based on nanobiotechnology. In 2009, joined Universitätsklinik für Radiologie, Medizinische Universität Innsbruck, where conducted research on developing highly sensitive, diagnostic, and targeted imaging probes with implications of in vivo imaging targeted contrast contrast agents. Her recent work was focused on the implication of nanotherapeutics approaches for diagnosis & treatment for neurodegenerative disorders with focus on motor neuron diseases.

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