

3rd Global Summit on Climate Changes and Sustainability

September 10-11, 2025 | Barcelona, Spain



Liliane MASSADE

U1195 Diseases and Hormones of the Nervous System, University Paris-Saclay and Inserm 94276, Le Kremlin-Bicêtre, France

Therapeutic potential of siRNA PMP22-SQ nanoparticles for Charcot-Marie-Tooth 1A neuropathy in rodents and non-human primates

Small interfering RNA (siRNA) has shown promising results for the treatment of Charcot-Marie-Tooth disease 1A (CMT1A) caused by overexpression of peripheral myelin protein (PMP22), leading to myelin dysfunction and axonal damage. Recently, we developed siRNA PMP22-squalene (SQ) nanoparticles (NPs) for intravenous use. Three consecutive injections of siRNA PMP22-SQ NPs at a cumulative dose of 1.5 mg/kg restored motor function in C61 transgenic mouse models. Pharmacokinetic studies showed a long half-life of antisense siRNA PMP22 in the sciatic nerve, and spinal cord, indicating targeted release potential. We further assessed the efficiency and safety of siRNA PMP22-SQ NPs in two healthy male non-human primates (*Macaca fascicularis*) after administering four escalating doses (0.1, 0.5, 2.5 and 4.5 mg/kg at one week interval). Interestingly, the siRNA PMP22-SQ NPs reduced PMP22 mRNA expression by approximately 70 % and probably induced an early-stage hereditary neuropathy with pressure palsies (HNPP)-like condition in two normal NHP. No preliminary toxicity was observed in organs or blood parameters of the two NHPs. Interestingly, the nerve conduction velocity decreased after the third injection of siRNA PMP22-SQ NPs. These results demonstrate the therapeutic potential of siRNA PMP22-SQ NPs, supporting advancement to further pre-clinical testing.

Biography

Dr. Liliane Massade is a Senior Director of Research CNRS and leader of Team 2 « Targeted Therapy for Peripheral Neuropathies" team at INSERM UMR 1195, also part of LaBEX Nanosaclay. With extensive expertise in cellular and molecular biology and siRNA pharmacology, her research is bolstered by prestigious grants from ANR, Nanosaclay, ARC, ERC, and SATT Paris Saclay. Dr. Massade has authored over 80 Scientific publications in top journals like *Comm. Biol*, *Cancer Res.*, *Oncogene*, *J Control Release*, and *PNAS*, and holds two patents. She is one of the four founders of MAAsiRNA (<https://www.maasirna.com/>) a startup based on her research work.