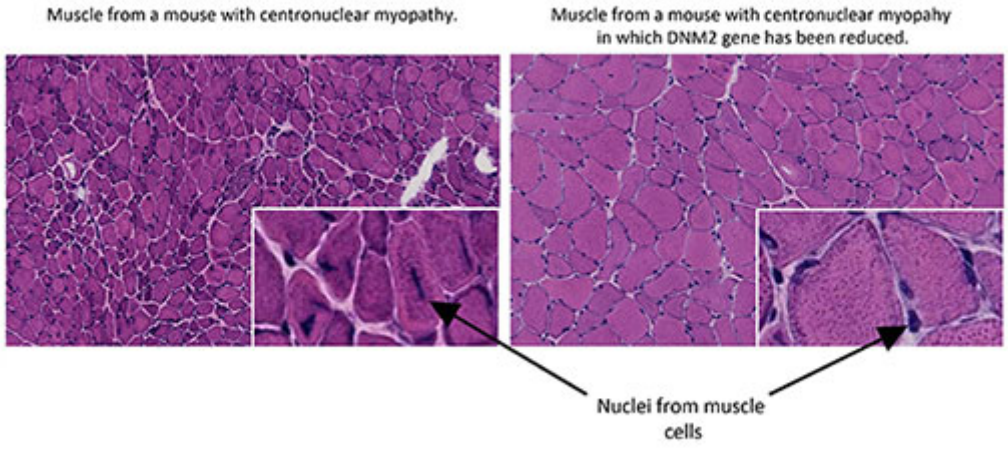
Cross therapy approaches for myotubular and centronuclear myopathies

Dr. Jocleyn Laporte

The MTM1 and DNM2 genes are implicated in different forms of myotubular /centronuclear myopathies. Dr Jocelyn Laporte's team, in collaboration with the Institute of Myology, found that targeting DNM2 can rescue myotubular myopathy due to defects in MTM1 in an animal model of the disease. By reducing the levels of DNM2 in mice with MTM1-related myotubular myopathy, they observed the amelioration of clinical signs of the condition, especially rescue of muscle strength and respiratory function, as well as a full rescue of lifespan.

In addition to the therapeutic potential, these results shed a new light on the mechanisms involved in all forms of centronuclear myopathy. It is one of the first examples of "cross-therapy", where the decrease of a gene altered in one myopathy (DNM2) rescues another myopathy resulting from the loss of a different gene (MTM1).

The identification of dynamin 2 as a novel therapeutic target for myotubular/centronuclear myopathies paves the way for further preclinical studies aiming to future clinical trials in patients, and testing how this strategy can be applied to other forms of centronuclear myopathies.



Figure's legend: In mice with myotubular myopathy (MTM1), also named centronuclear myopathy due to the central position of nuclei, muscle fibers are smaller and unable to produce a normal muscle contraction (left). The decrease in dynamin (DNM2) leads to normal fiber size and allows the correct positioning of muscle nuclei at the periphery (right).