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Science

Amyotrophic lateral sclerosis (ALS) is a progressive and fatal neurodegenerative disease characterised by the selective loss of motor neurons in the brain and spinal cord. This motor neuron death will ultimately result in the progressive paralysis and death of the patient due to respiratory insufficiency, usually within 5 years after the diagnosis. In 90% of the cases there is no familial history present (sporadic ALS; SALS), while in the remaining 10% a genetic origin underlies the disease (familial ALS; FALS). Until recently mutations in the superoxide dismutase 1 (SOD1) gene were the best known cause of familial ALS (20% of FALS) and animal models for SOD1-linked ALS played an important role in the study of the underlying pathogenic mechanism of ALS. However, in 2009 mutations in a new gene, FUS (fused in sarcoma), were found in patients with FALS. In this project we will develop different transgenic animal models to gain insight in the way mutations in the FUS gene cause selective motor neuron death. On the one hand, mouse models will be designed to study which cell types and which molecular pathway(s) are involved in the disease causing mechanism of FUS-induced ALS. On the other hand, we will use zebrafish models in screening experiments to identify potential therapeutic targets.