Columbia Technology Ventures

Animal model system for the treatment of ALS

Technology #cu16273

Accurate animal models are critical tools in the research of incurable diseases such as amyotrophic lateral sclerosis (ALS). While animal models describing the ALS gene SOD1 are available, many other crucial gene targets have remained poorly defined, limiting drug discovery. This technology describes, in addition to its wild type control strain, a mutant mouse containing a pathological point mutation in the FUS (FUsed in Sarcoma) gene that is strongly associated with an early onset form of ALS. In focusing on a signaling pathway distinct from that of current ALS mouse models, this technology can find and describe new proteins that are involved in ALS pathophysiology. As such, this technology provides a robust animal model system that can identify new disease mechanisms and validate promising ALS therapeutic targets.

FUS mutant mice for a clinically relevant, highly accurate model of juvenile ALS

This technology provides a comprehensive animal model system for the investigation of a well-established familial ALS mutation and the subsequent design of effective therapeutics against it. Unlike other ALS mouse models, these mice contain a conditionally expressed point mutation in a distinct ALS gene called FUS (FUsed in Sarcoma). This point mutation (P525L) is specific to a juvenile onset, rapidly progressing form of ALS that has few treatment options. Expressing this mutation in mice will allow for differentiation between ALS subtypes and a better understanding of disease pathology. Further, as the mice are expressing the human form of the P525L-FUS protein, they provide a clinically relevant model of ALS that can be used to identify promising new drug candidates. Any therapies derived from this technology are expected to be compatible with current treatments, as the FUS protein is found in a different signaling pathway from the commonly targeted SOD1. This technology includes wild type mice of the same genetic background, ensuring that all data generated are highly accurate.

The mutant mice exhibit key differential symptoms of ALS, including selective and progressive motor neuron degeneration. These findings are preceded by structural and functional abnormalities at the neuromuscular junction, including withdrawal of the motor axon from the muscle itself.
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Applications:

- Basic ALS research
- Testing potential ALS therapeutics
- Drug discovery
- Can be used in pre-clinical drug trials
- Identifying the pathophysiology of FUS mutations

Advantages:

- Utilizes well-established familial ALS mutation
- Mice recapitulate phenotype with great clinical accuracy
- System contains both genetic background control and mutant mice

Patent Information:

Patent Pending

Tech Ventures Reference: IR CU16273, IR CU16274

Related Publications:


Inventors

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