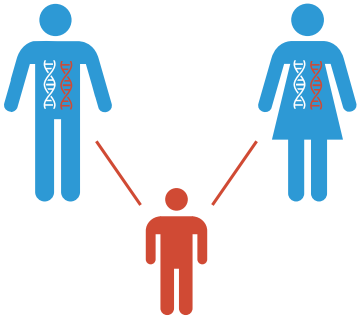
What is Krabbe Disease?

Krabbe disease is a rare genetic disease

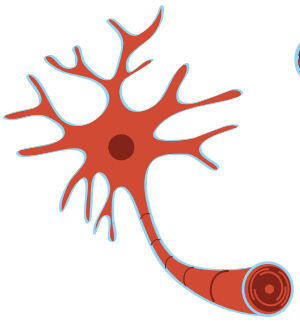
Krabbe disease is one of a group of diseases called "leukodystrophies". These diseases all result in a loss of myelin (or demyelination), which is the material that surrounds and protects nerve fibers and ensures that signals are transmitted quickly throughout the brain and nervous system.

Krabbe disease, also known as globoid cell leukodystrophy, is caused by genetic mutations in the GALC gene that lead to lower levels of an enzyme called galactosylceramidase. Lack of this enzyme will lead to an accumulation of a substance, called psychosine, that is toxic to myelin-producing cells. Krabbe disease is also characterized by abnormal cells, called globoid cells, in the brain.

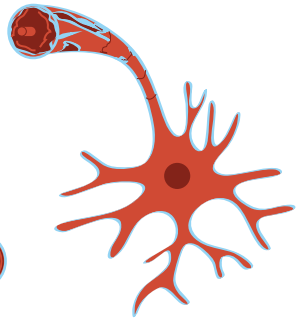
Krabbe Disease is caused by inherited mutations from both parents



Healthy Myelin Surrounding a Nerve Cell



Deteriorated Myelin



Infantile Krabbe Disease
(30-40% of cases)

Late-Infantile Krabbe Disease
(20-30% of cases)

Juvenile Krabbe Disease
(10-20% of cases)

Adolescent or Adult Krabbe Disease
(20-30% of cases)

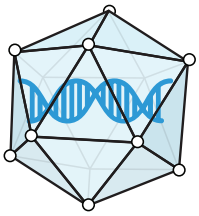
Severe Neurologic and Motor Symptoms

There are several forms of Krabbe disease that range in severity

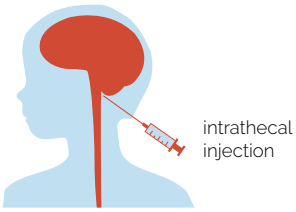
HOW CAN GENE THERAPY HELP?

Gene therapy represents a promising new therapy with the potential to significantly slow or stop progression of neurological and other deficits and to improve quality of life. While several approaches to Krabbe disease gene therapy are being developed, intrathecal gene therapy strives to deliver functional copies of the *GALC* gene to the brain via the cerebrospinal fluid.

1. a normal, healthy copy of the *GALC* gene is produced

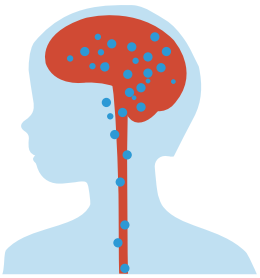


2. gene is inserted into a harmless Adeno-Associated Virus (AAV) to create a viral vector



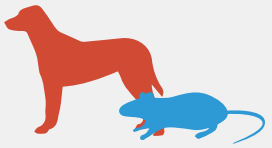
3. AAV vector is injected into the cerebrospinal fluid (CSF) that flows around the brain and spinal cord

4. some cells take up AAV vector and begin to make functional galactosylceramidase enzyme, which is released into the CSF



5. the secreted enzyme can be used by other cells throughout the brain and spinal cord which may slow or stop progression of the disease

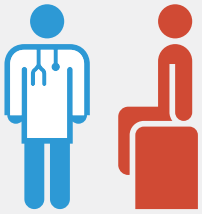
Safety First



Safety is currently being evaluated in animal models

Preclinical data in animal models shows very promising results, such as extended life expectancy and significant improvement in quality of life

What's next?



Early clinical trials to evaluate the safety of gene therapy in Krabbe patients are on the horizon