PRETERM BIRTH AND BRAIN INJURY



When is a baby born preterm?

Before 28 weeks

Extremely preterm

28-32 weeks

Very preterm

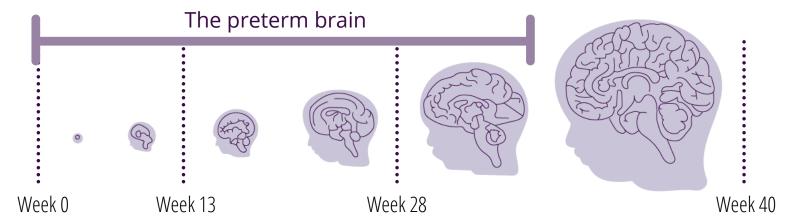
32-37 weeks

Late preterm In the European Union 400,000 babies are born preterm every year



The average length of pregnancy, or gestation, is 40 weeks

Preterm birth disturbs the development of the baby's brain



Trimester 1:

Neural tube develops and forms the basic regions of the brain

Trimester 2

More complicated brain structures start to develop as more neurons are added to the brain

Trimester 3

The brain nearly doubles in size during the final trimester!
Babies born preterm have to make these huge changes while confronted with challenges from the real world



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 874721. Results reflect the author's view only. The European Commission is not responsible for any use that may be made of the information it contains.

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What can cause preterm brain injury?

Infection which leads to the mother's body producing inflammatory factors

Exposure of the baby in utero to inflammation as a response to an inflammatory agent

Exposure after birth • to infection, e.g. sepsis

Lack of adequate nutrition after birth

Preeclampsia (high blood pressure and increased protein levels in the mother's urine)

Ischemia (restricted or decreased blood flow in the brain)

Damage to glial cells (those which support neurons) Asphyxiation (lack of oxygen)

What can be the long-term effects of preterm brain damage?





Cognitive impairment

Visual disturbances

Autism

Epilepsy

Cerebral palsy

Delayed development

Key messages



We have treatments and interventions which can improve the effects of brain injury, for example by reducing pain and increasing mobility.

However, there are no therapies to repair or reverse brain damage.



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The PREMSTEM project is investigating stem cells as a repair mechanism to treat brain damage in preterm babies

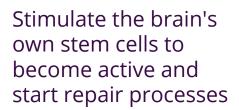


Stem cells: The body's building blocks!

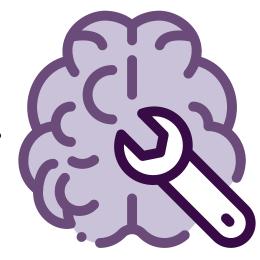


We use donated Human Mesenchymal Stem Cells taken from umbilical cord tissue in our research

Stem cell treatments make and release amazing trophic factors that can:



Reduce inflammation and allow new connections between cells to occur



Support the (re)building of blood vessels to bring nutrients to the brain

A trophic factor is a molecule that supports cell survival

Enable cells to insulate and improve connectivity between brain regions







in @premstem #premstem



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