Protection of the preterm brain against inflammatory stress

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Protection of the preterm brain against inflammatory stress:
A promising role for stem cell-based therapy and Annexin A1

Luise Klein

1. Multipotent Adult Progenitor Cells enhance the brain directed and cerebral immune response in the presence of preceding antenatal inflammation indicating an *in vivo* licensing effect of stem cells (*this thesis*).

2. The neuroimmune axis including brain barriers and how to modulate it is an important field for future research in neonatal brain injury and other neuroinflammatory conditions (MS, AD, Parkinson).

3. Annexin A1, a trophic and downstream factor of stem cells, potentially acts by prevention of blood brain barrier injury and mediator of resolution of inflammation (cerebrally, systemically) (*this thesis*).

4. Circulatory Annexin A1 might have potential as new biomarker for BBB disruption in preterm brain injury and should warrant further investigation (*this thesis*).

5. Sex- and route-dependency on treatment efficacy of Annexin A1 after hypoxia-ischemia-mediated brain injury should not be ignored (*general discussion*).

6. Combining Annexin A1 with stem cell therapy or hypothermia might be a new therapeutic strategy for the future (*Impact*).

7. To move stem cells from preclinical work into clinical trials, perinatal animal studies are essential to create consensus about treatment regime (dose/ dosing interval & duration/route/type of stem cell).

8. Fragility and strength upon a bad start are not necessarily opposites (Life lessons from the Lamb Intensive Care Unit).

9. Research is like growing a plant - you care for it, you observe and stay on track, you usually only postulate what went not as planned when leaves (experiments) are turning yellow/brown (went not the way you hypothesized), its development is unforeseeable and you can propagate it endlessly…

10. "Sometimes, I do wonder why
    These leaves keep fallin'
    Leaves keep fallin'
    Sometimes, I do wonder why
    Leaves keep fallin'
    Leaves keep fallin'

    Keep searchin'"– (*Leaves - Alle Farben*)