

TBI THERAPY WEBINAR: ADULT STEM CELLS FOR TBI

By Dr. John Hughes
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- TBI Therapy - 2014



LEARNING OBJECTIVE

- What is a traumatic brain injury (TBI)?
- What are stem cells?
- How do stem cells help TBI?

WHAT IS A TBI?



- “Brain dysfunction caused by an outside force, usually a violent blow to the head.”
- Occur mostly during sports injury, auto accidents, falls, blasts, blunt force trauma

IMMEDIATE

Loss of consciousness
Confusion
Head pain
Blurry vision
Difficulty concentrating
Memory loss
Dizziness
Nausea and vomiting



PERSISTENT

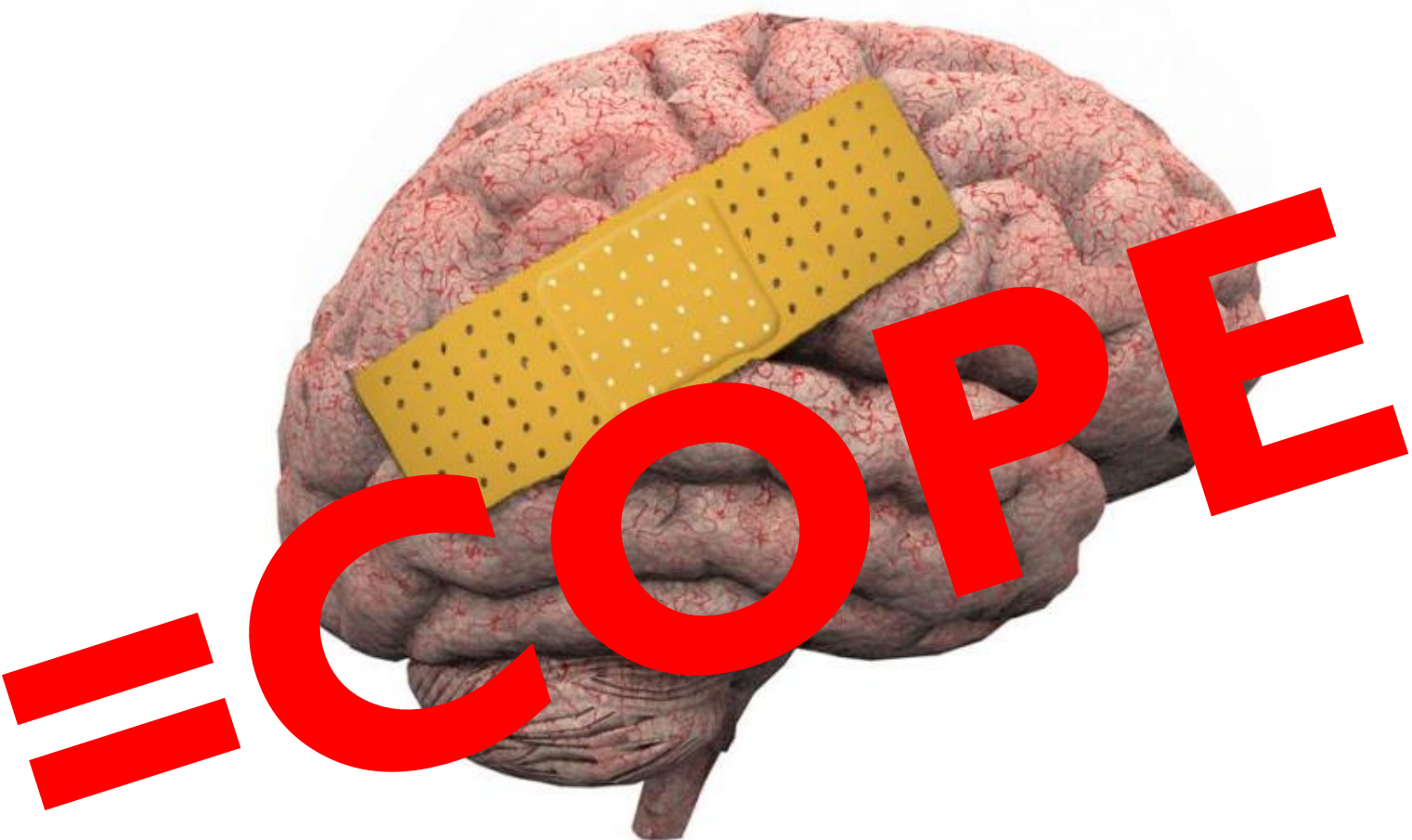
Cognitive: memory loss, slow reaction time, inability to pay attention, slow learning, difficulty understanding, etc.

Physical: headache, fatigue, sleep disorders, tinnitus, loss of smell, sensitivity to light and sound, etc.

Psychological: irritability, frustration, anxiety, personality changes, disinhibitions, suicidality, depression, etc.

SYMPTOMOLOGY





HOW DO YOU HEAL FROM A TBI?

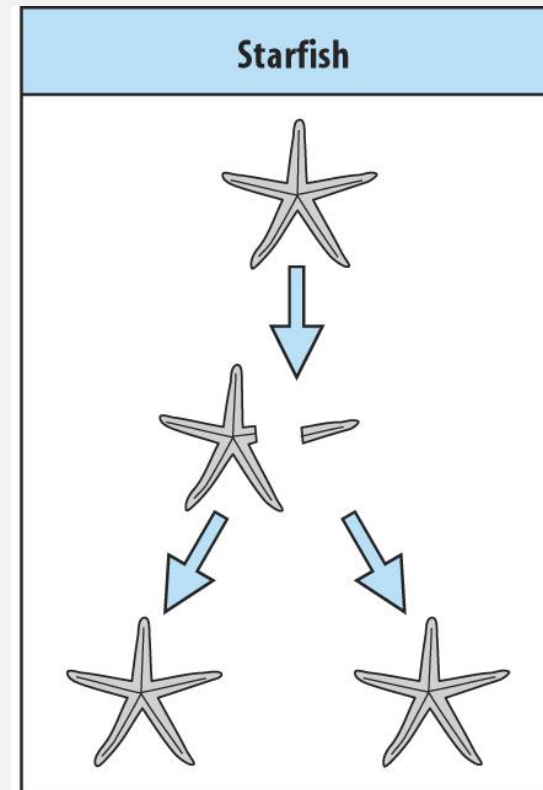
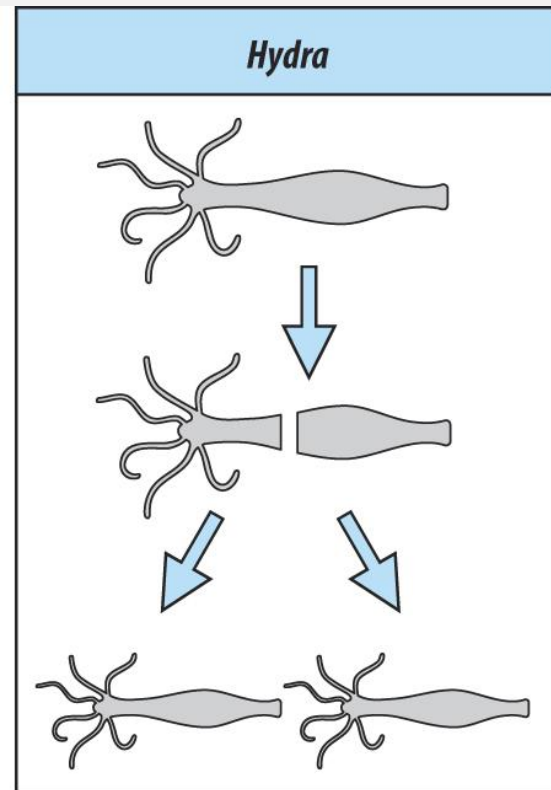
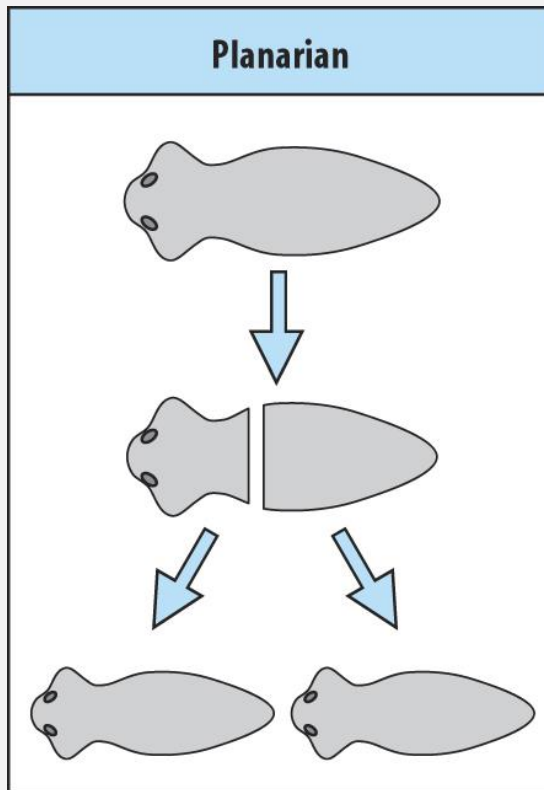
- Rest
- Medication
- Rehabilitation
- Cognitive behavioral therapy

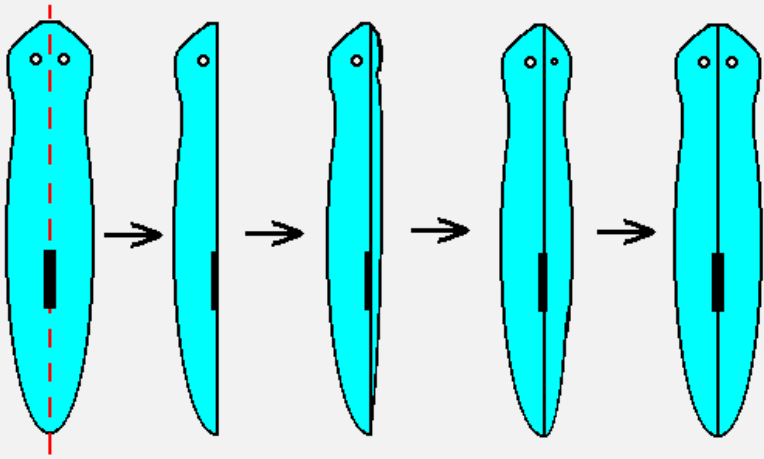


**BUT WHAT ABOUT
REGENERATION?**

“The action or process of regenerating or being regenerated, in particular the formation of new animal or plant tissue.”

WHAT IS
REGENERATION?





PLURIPOTENT

- Can a single stem cell regenerate a whole animal? YES
- Flatworms (planaria) have pluripotent stem cells
 - These cells that can make ALL the cell types of the animal's body



MULTIPOTENT

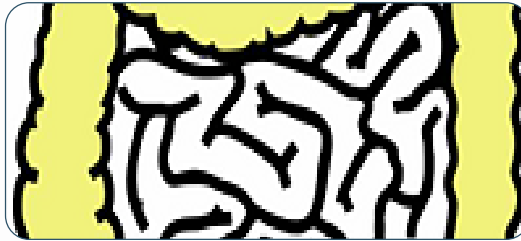
WHAT IS
REGENERATION?

- Are these the same cells to regenerate a lizard's tail? NO
- These are multipotent tissue-specific stem cells
 - These cells only make the types of cells in that particular tissue

DO HUMANS REGENERATE?



Epidermis



Gut lining



Liver

= Multipotent Tissue-Specific (like a lizards tail)



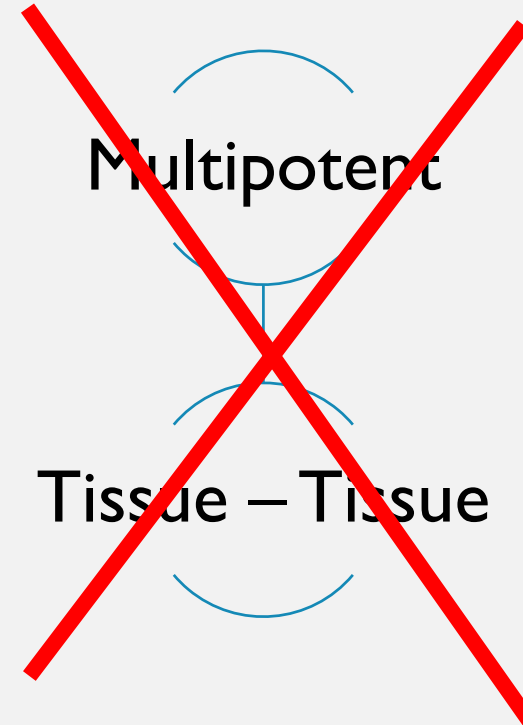
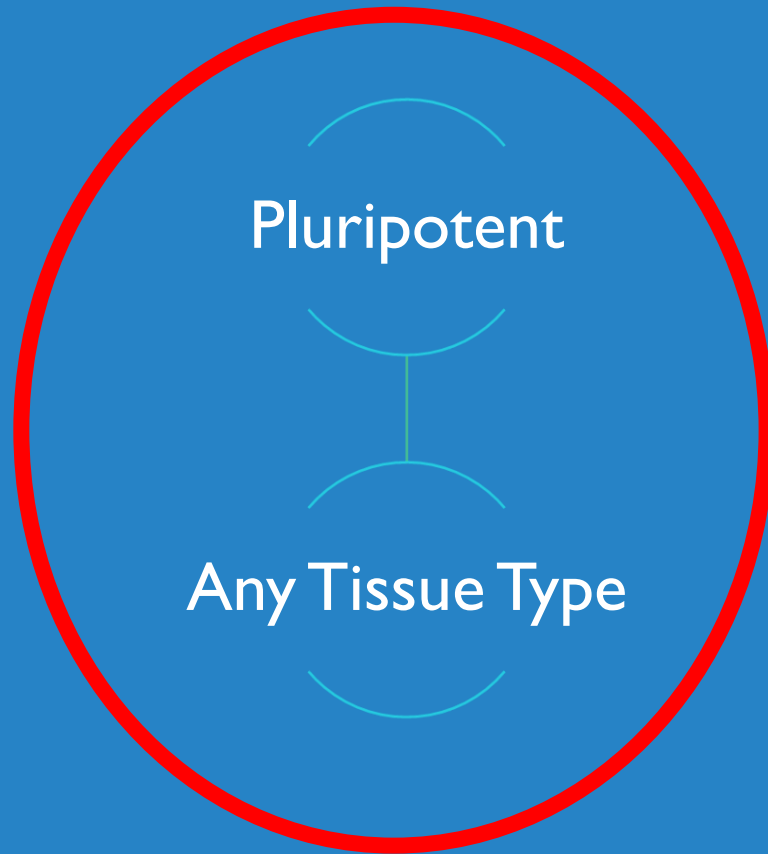
REGENERATION AND THE BRAIN

Cell death occurs
after a brain injury



New cells are
needed to
regenerate new
brain tissue

WHICH TYPE OF STEM CELLS ARE NEEDED TO GROW NEW BRAIN TISSUE?

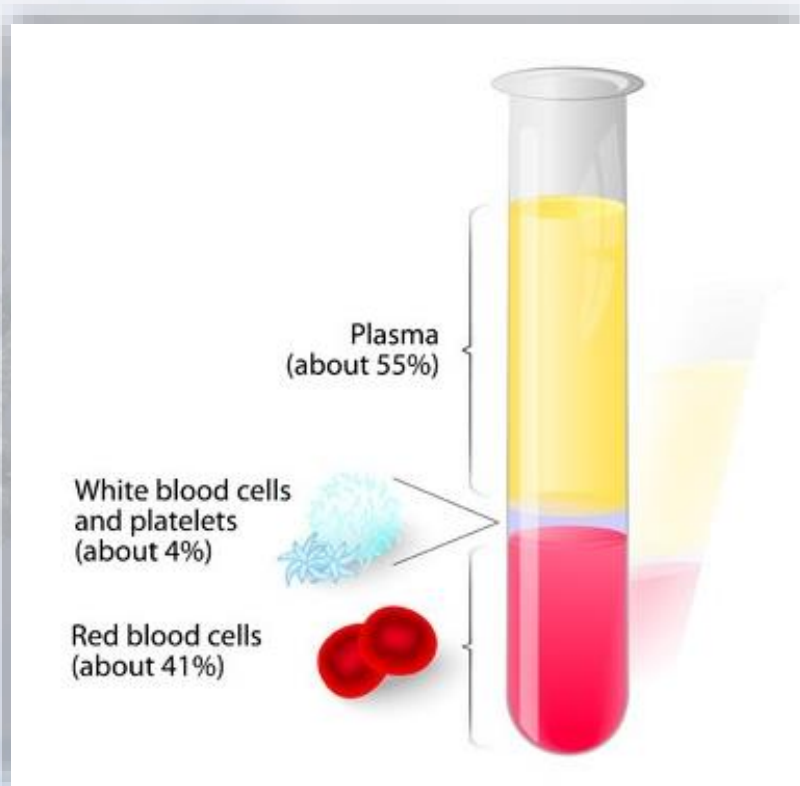




PLURIPOTENT STEM CELLS

- Recently discovered in peripheral blood
- Behave like embryonic stem cells
- Give rise to all the cell types
- Long lifespan
- Stem cells work in combination with PRP

PLATELET RICH PLASMA (PRP)



- Also from the blood
- Full of growth factors
- Promotes cell differentiation and maturation

STEM CELLS AND PRP WORK TOGETHER

- Stem cells = seeds
- Growth factors =
soil/water/fertilizer/sunlight
- Without growth factors, the seed
cannot mature and grow



STEM CELL AND PRP PROCEDURE

1. Draw blood

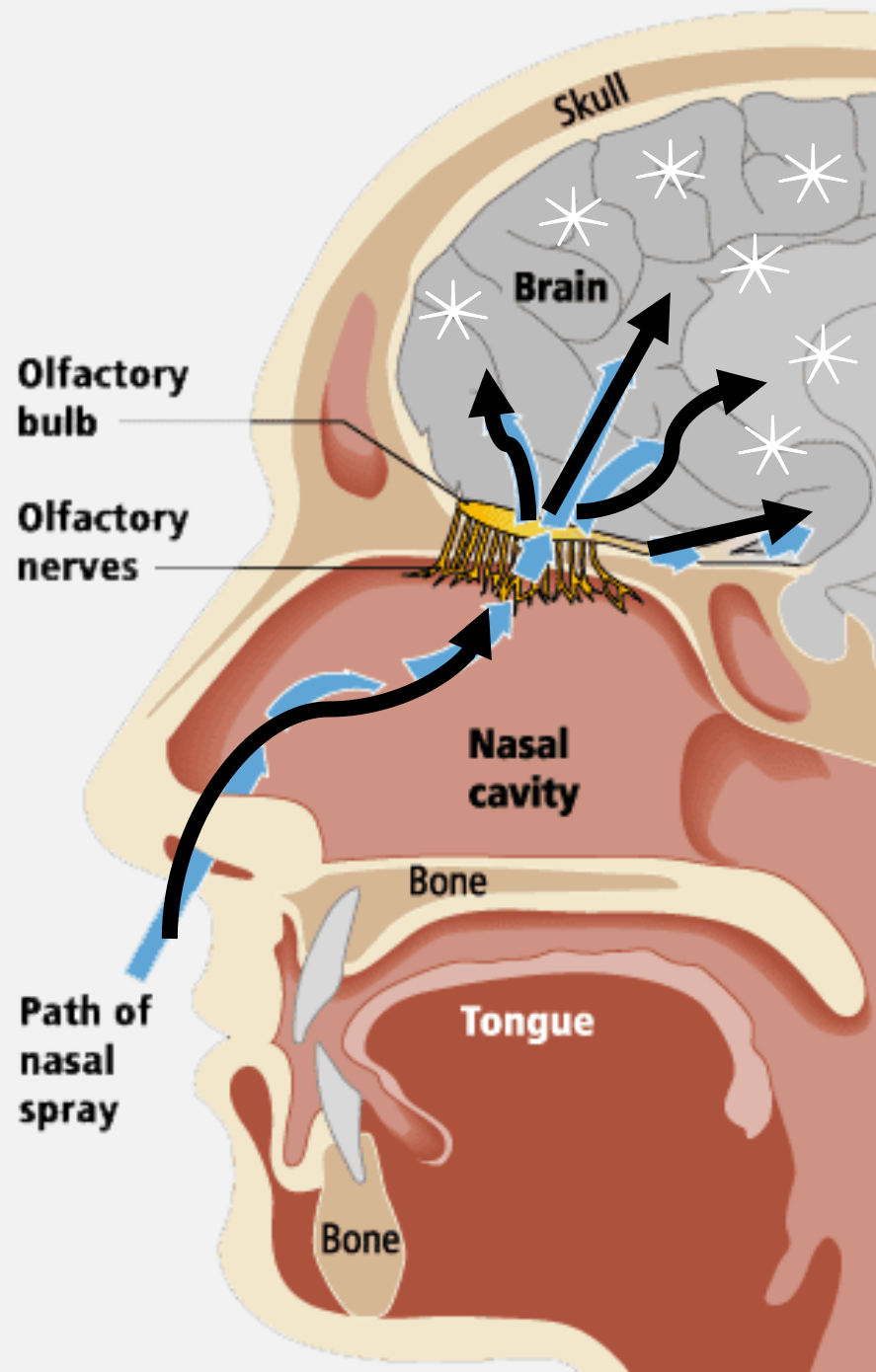
2. PRP and stem cells go through harvesting

3. Cells reinfused through IV

4. Cells reinfused through nose



JOURNEY THROUGH THE NOSE

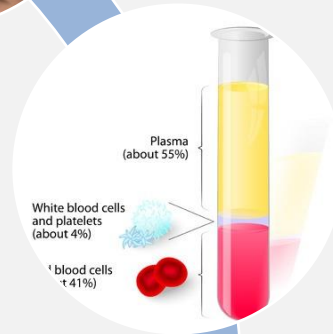


- Through the olfactory nerves
- Bypasses the blood-brain barrier
- Into the CSF within 10 minutes

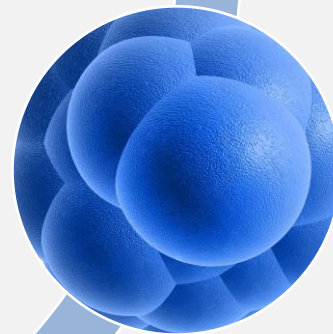
TBI Therapy Protocol



HBOT (10-15) sessions
before and after stem cells



PRP infused IV and
intranasally the day before
stem cells



Stem cells are infused
IV and intranasally the
day after PRP

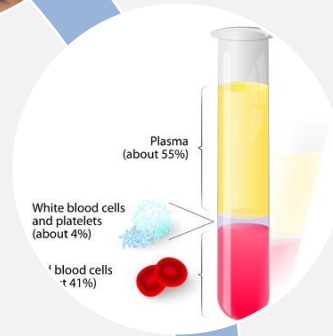


Cranial osteopathy
administered throughout
treatment

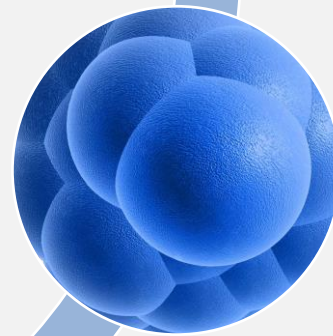
How This Helps TBI



HBOT enhances healing,
upregulates stem cells



PRP guide the stem cells
to the proper area



Stem cells regenerate
and rebuild tissue



Cranial osteopathy allows
the cells to bathe the brain

PATIENT RESULTS

Improved mental stamina

Less sensitivity to light and sound

Improved memory

Less emotional stress

Increased ability to prioritize

Better mental clarity

Improved quality of life



STUDIES & REFERENCES

“Intranasally administered cells could bypass the blood-brain barrier by migrating from the nasal mucosa through the cribriform plate along the olfactory neural pathway into the brain and cerebrospinal fluid (CSF).”

Danielyan, L., Schäfer, R., von Ameln-Mayerhofer, A., Buadze, M., Geisler, J., Klopfer, T., ... & Buniatian, G. H. (2009). [Intranasal delivery of cells to the brain](#). *European journal of cell biology*, 88(6), 315-324.

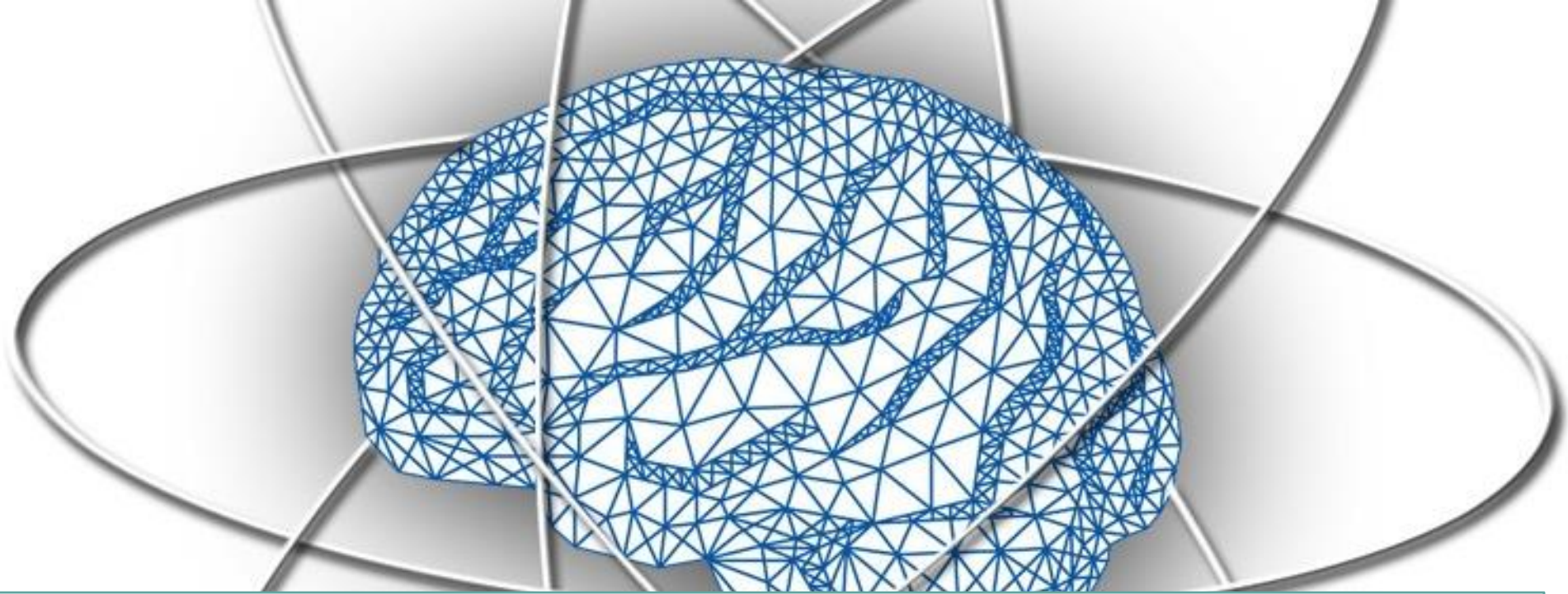
“Pluripotent stem cells are responsive to any lineage-induction agent ... across all three primary germ layer lineages.”

Young, H. E., & Black, A. C. (2005). [Differentiation potential of adult stem cells](#). In *Stem Cells in Endocrinology* (pp. 67-92). Humana Press.

“The ability to store, expand, and differentiate these PSC from autologous peripheral blood should make them valuable candidates for transplantation therapy.”

Zhao, Y., Glesne, D., & Huberman, E. (2003). [A human peripheral blood monocyte-derived subset acts as pluripotent stem cells](#). *Proceedings of the National Academy of Sciences*, 100(5), 2426-2431.





Q&A

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