

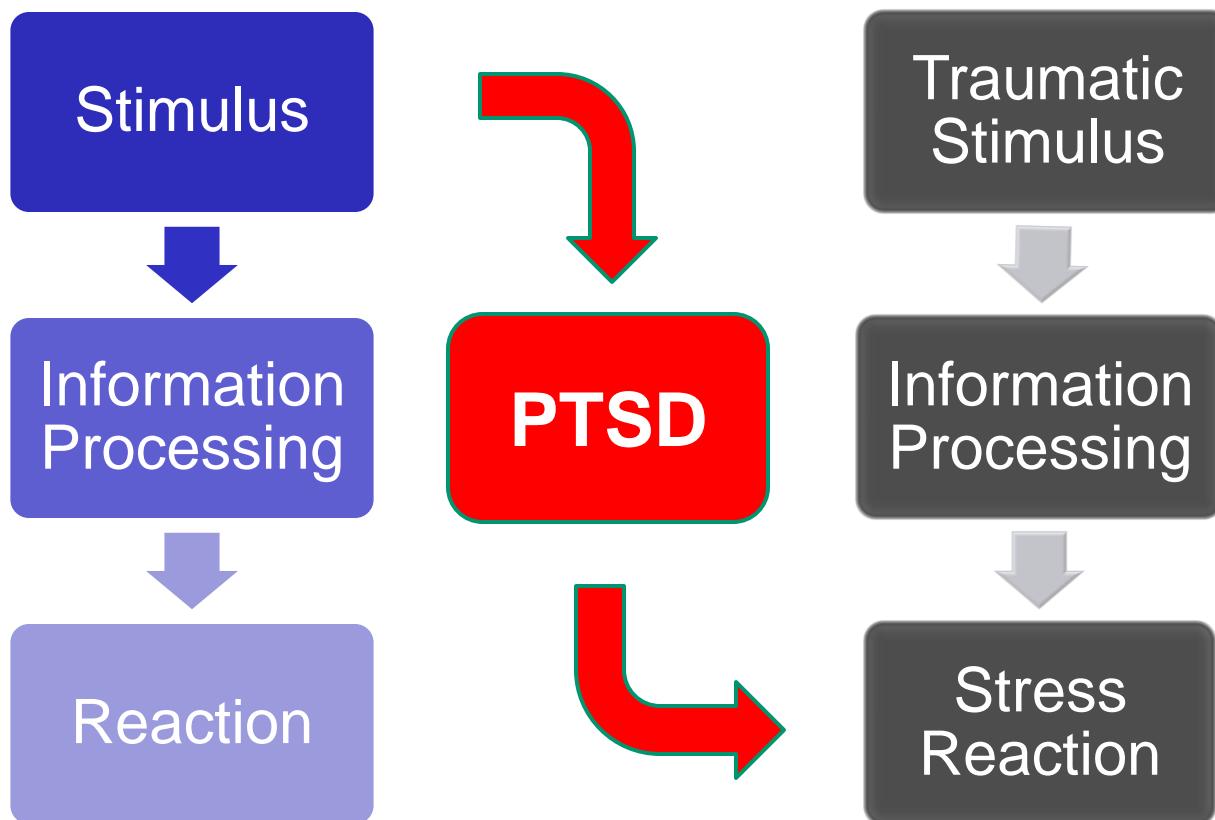


Μεταβολές της νευρο-γλοιο-διαβίβασης στον ιππόκαμπο, στο πλαίσιο της πειραματικής παιδικής μετατραυματικής διαταραχής

Ismini E. Papageorgiou, MD, PhD

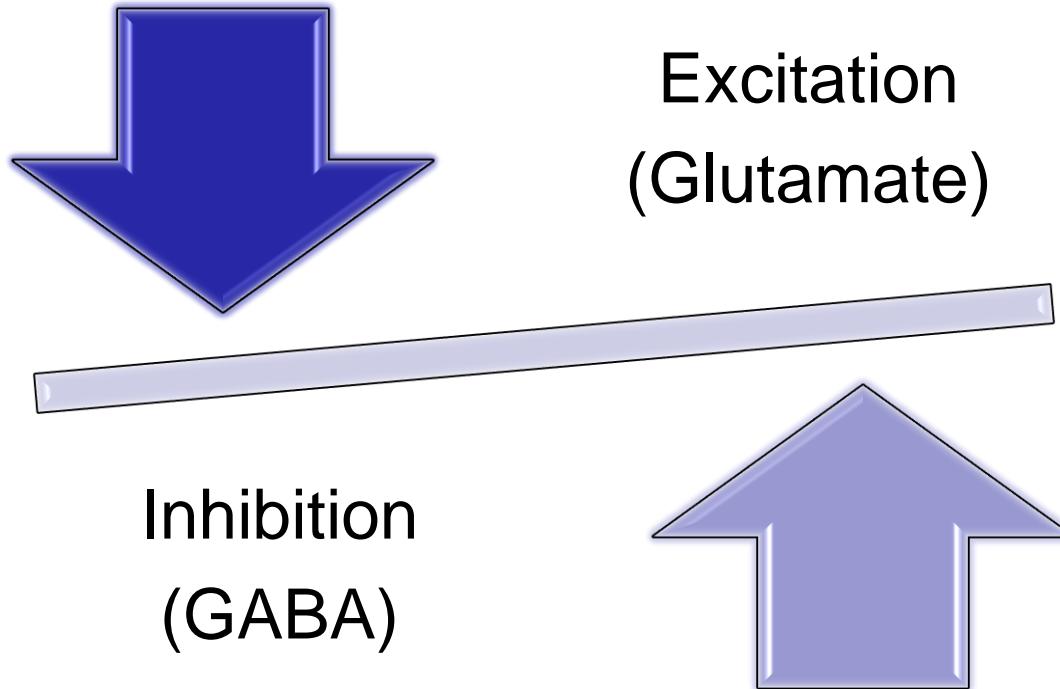
Universitätsmedizin Göttingen
Institut für Diagnostische und Interventionelle
Neuroradiologie

Post Traumatic Stress Disorder (PTSD): Erroneous **shuttle** in information processing ??

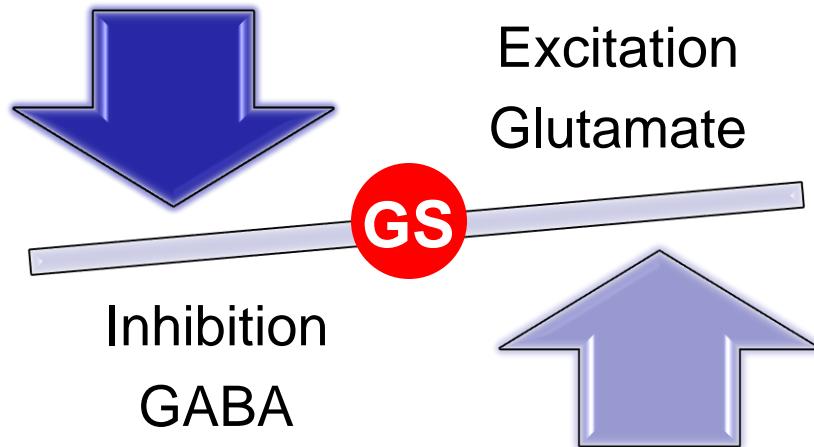


Information processing

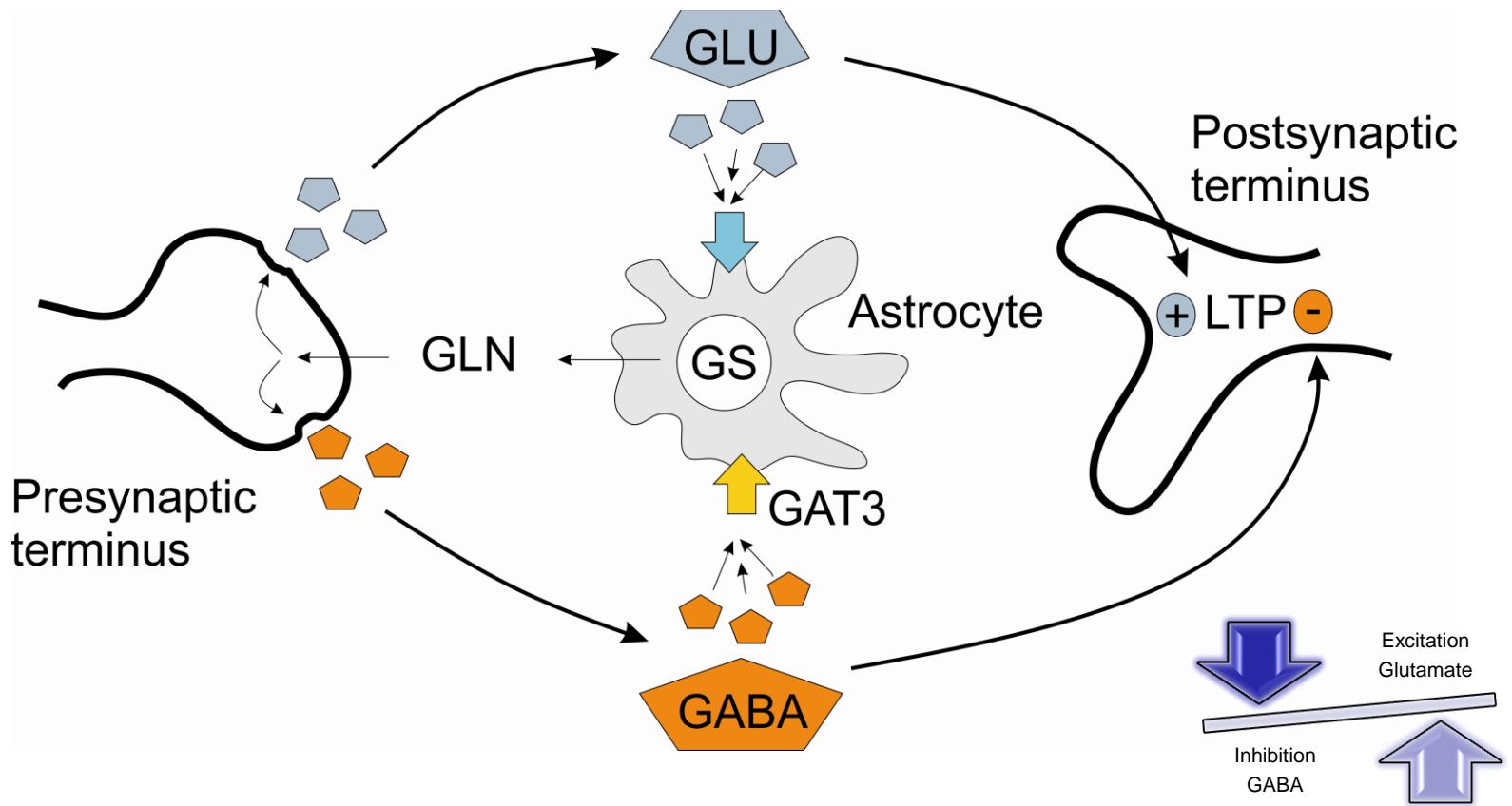
Ratio of excitatory to inhibitory activity, E:I ratio.



Astroglia participate in E:I balancing with **Glutamine Synthetase**

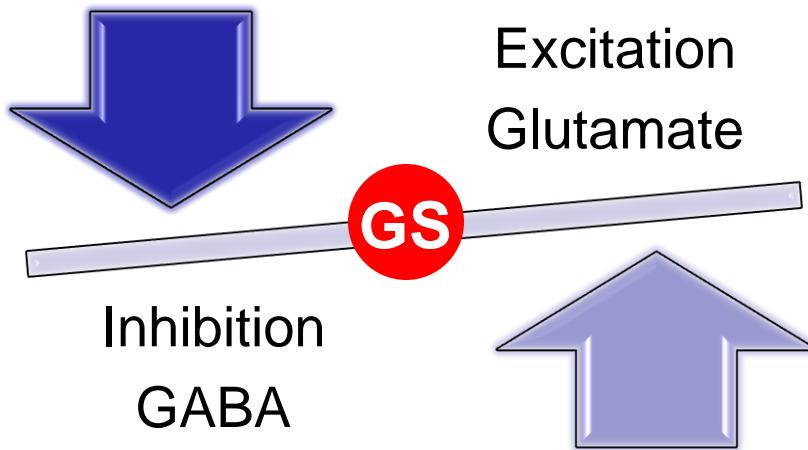


Astroglia use **glutamine synthetase** to recycle both GLU and GABA.

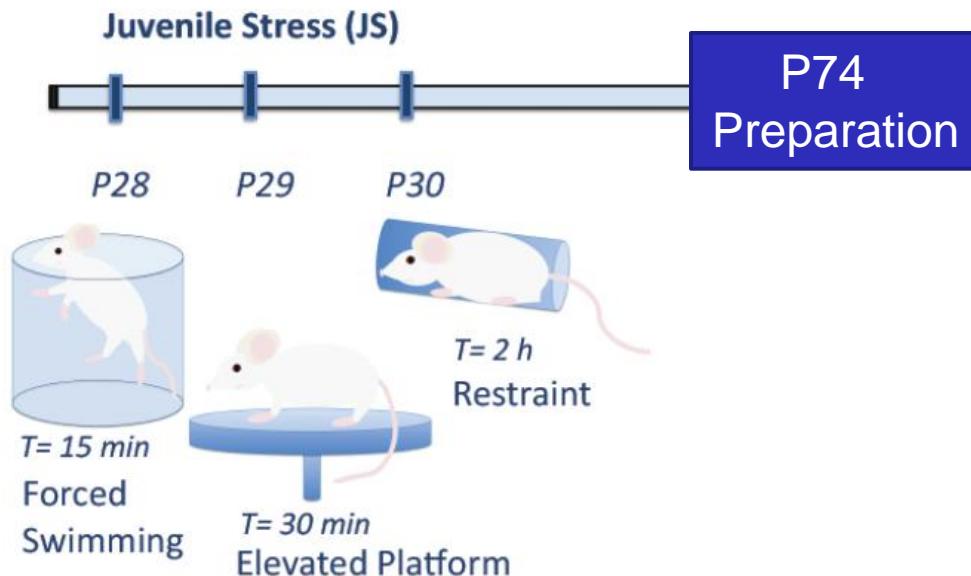


Hypothesis on PTSD

- Astroglial changes influence information processing in PTSD



Experimental model for PTSD



Readouts

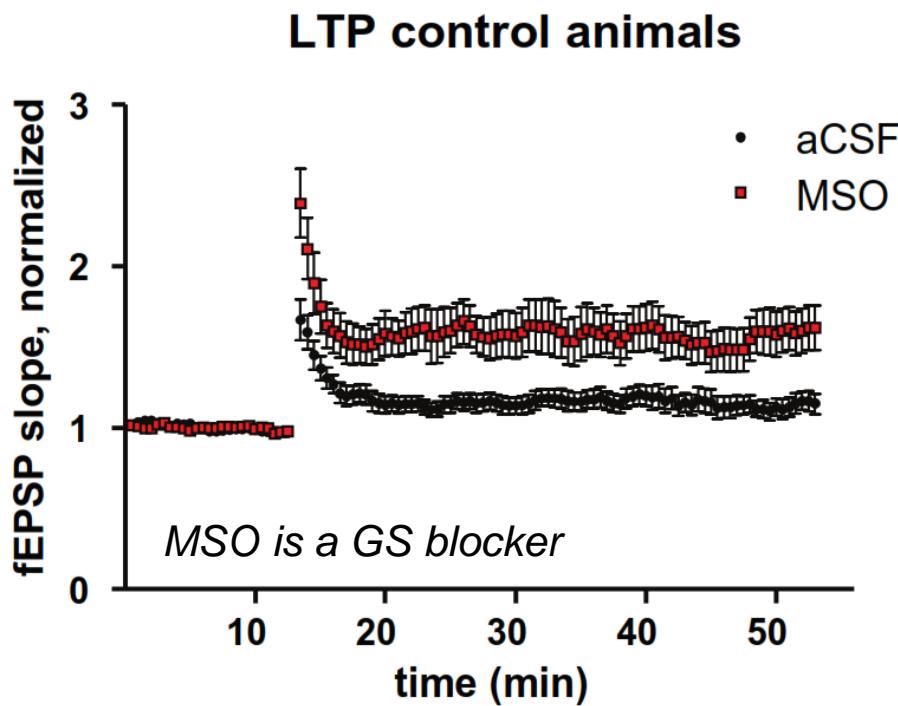
Hippocampus, CA1 subregion

In vitro electrophysiology:
Long-term potentiation

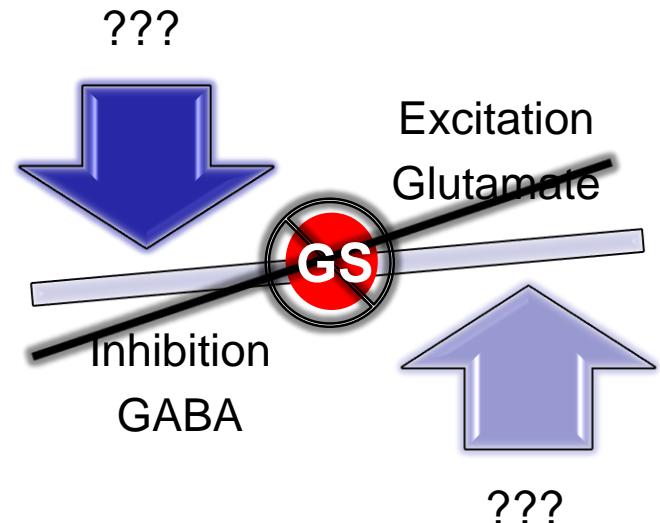
Laser microdissection and rt-PCR for **RNA** expression

Immunohistochemistry for **protein** expression

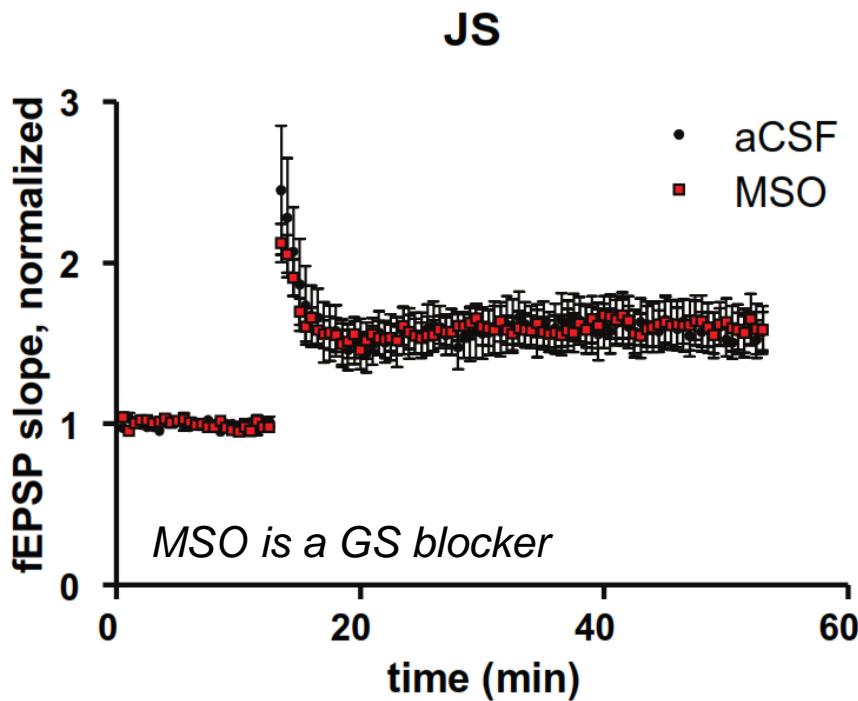
In control animals **GS blockade** enhances LTP



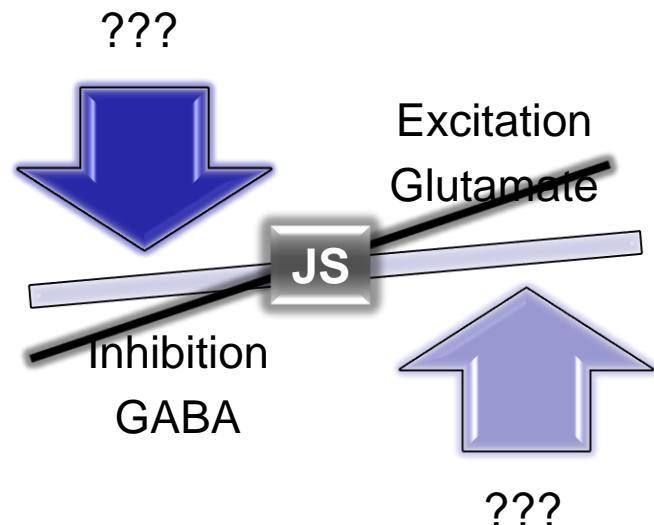
Is it over-excitation or dis-inhibition ?



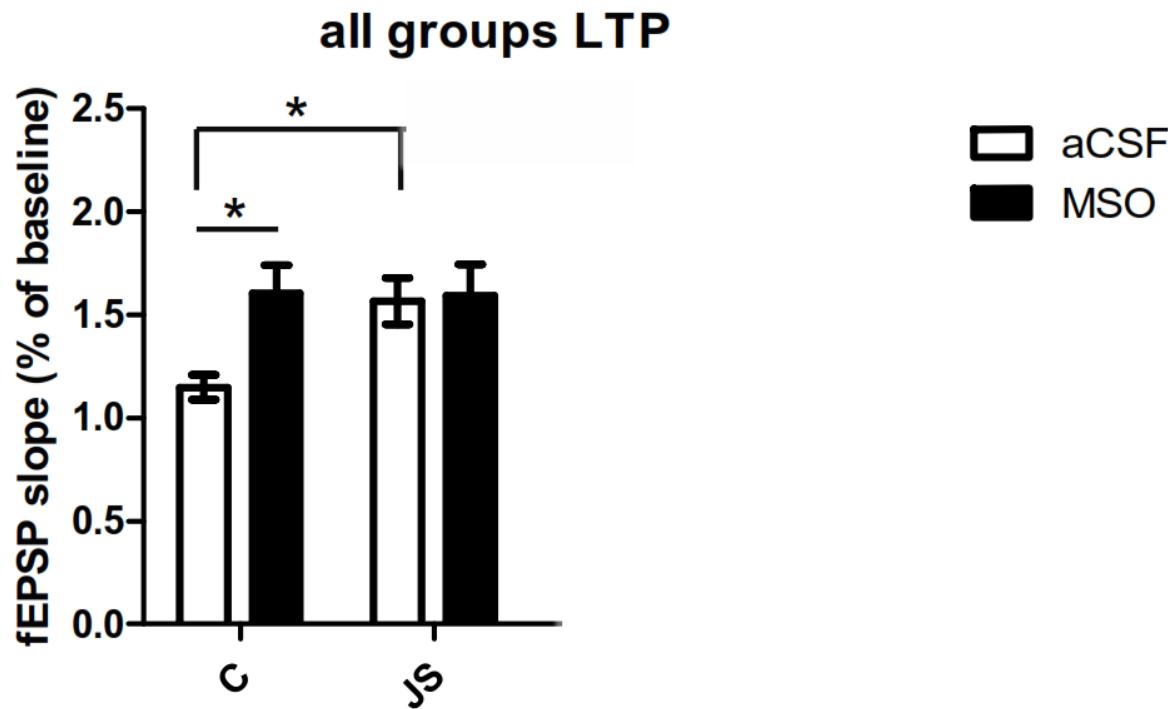
Juvenile Stress (JS) increases LTP in an **non-overlapping pattern** with GS blockade



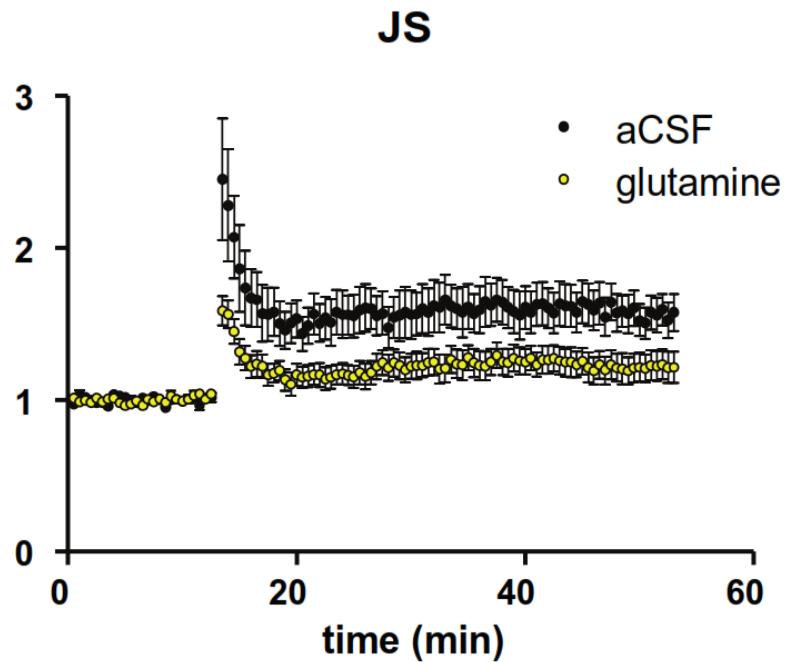
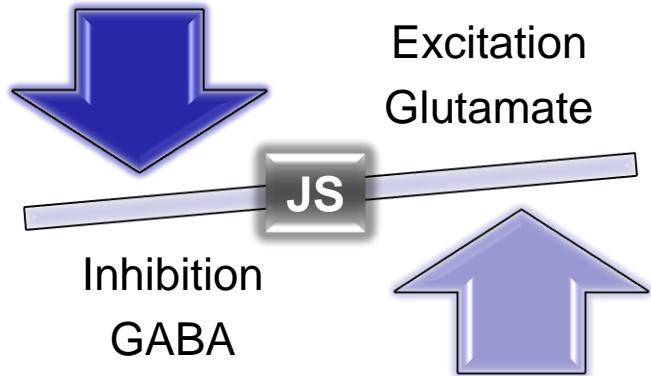
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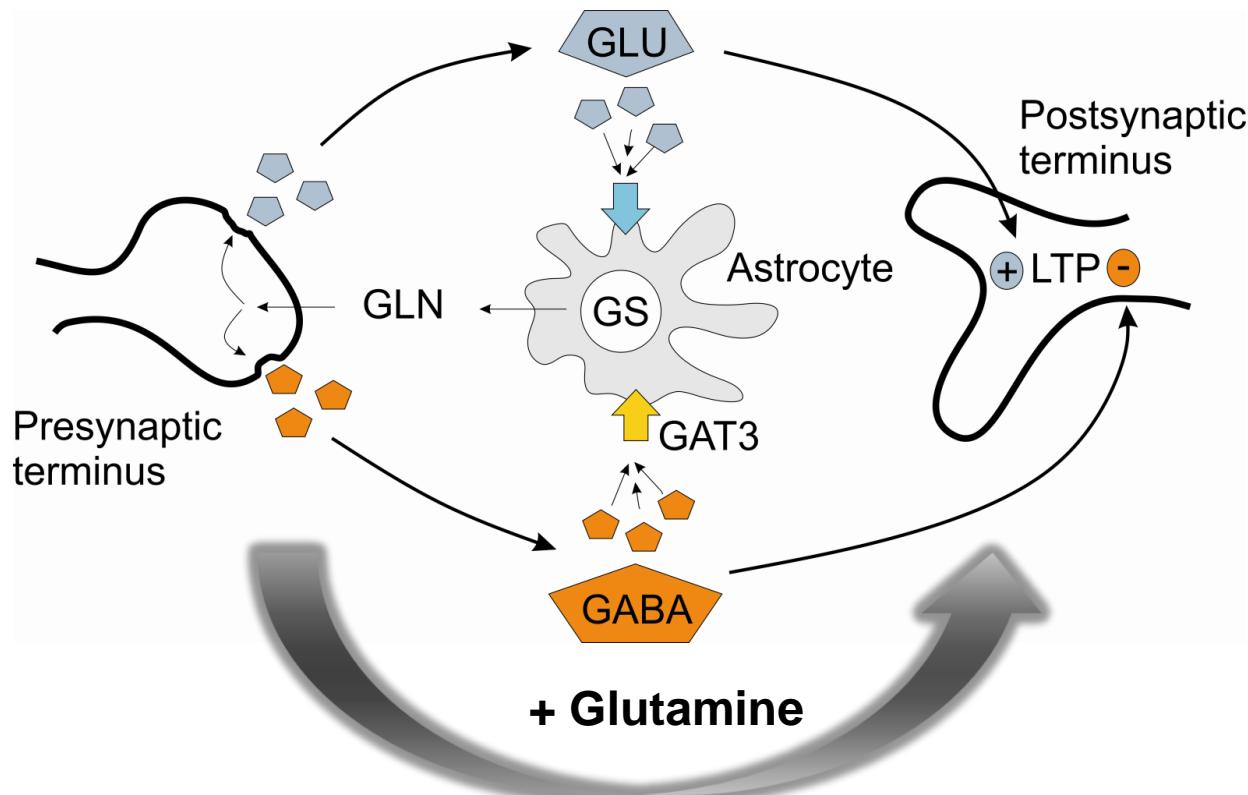
Juvenile Stress (JS) increases LTP up to the level of GS blockade



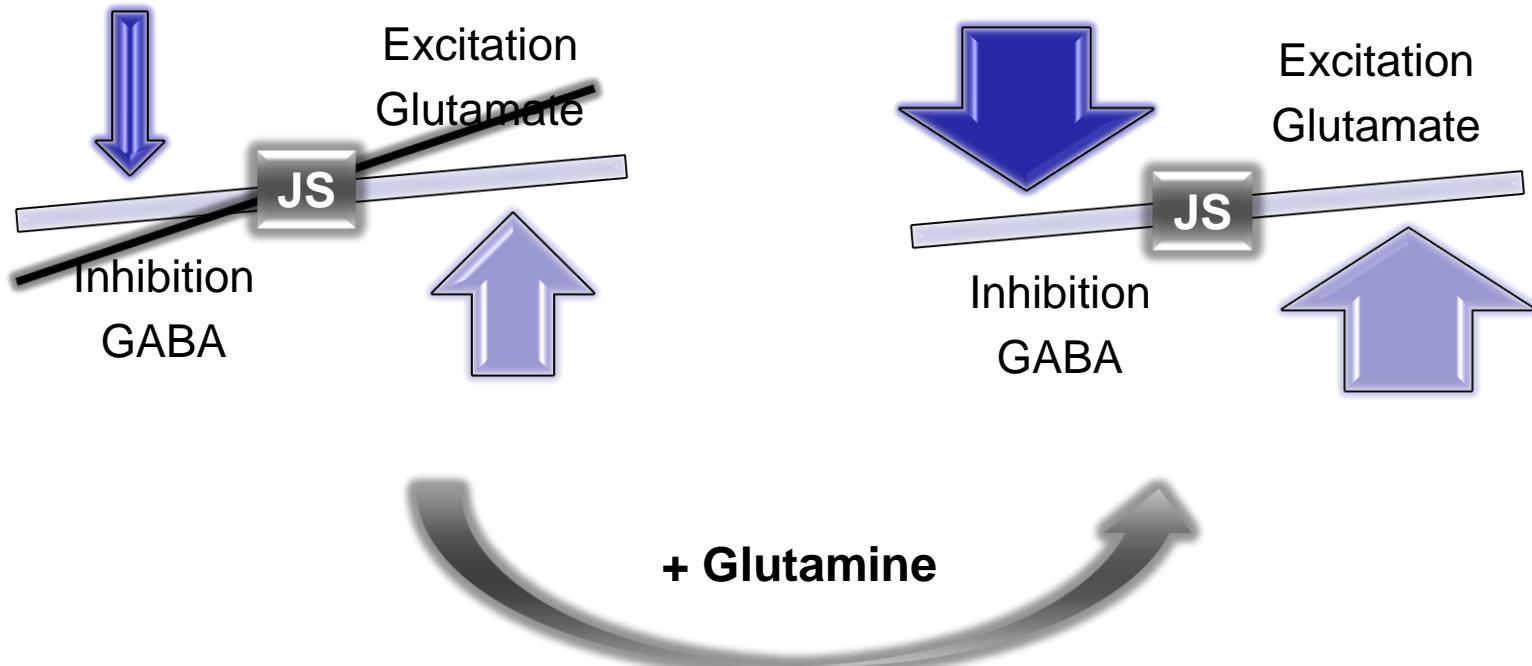
Supplementation with glutamine (GS product) recovers LTP down to the physiological range



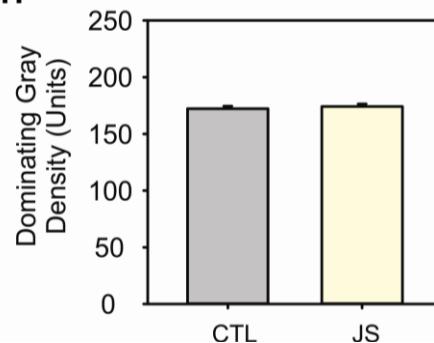
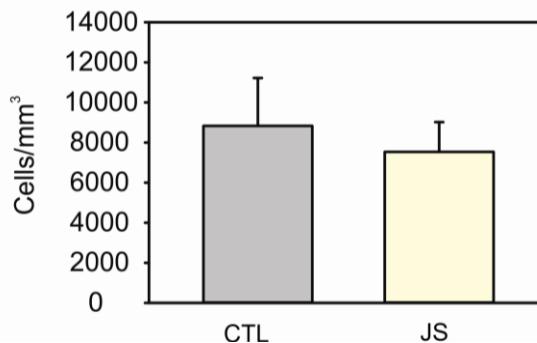
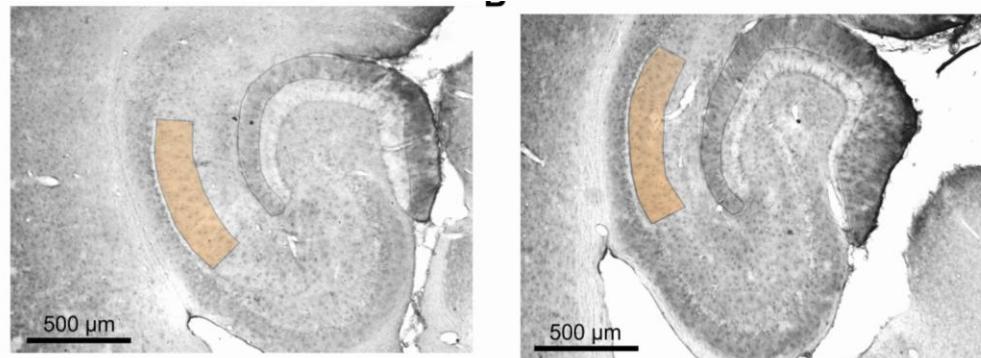
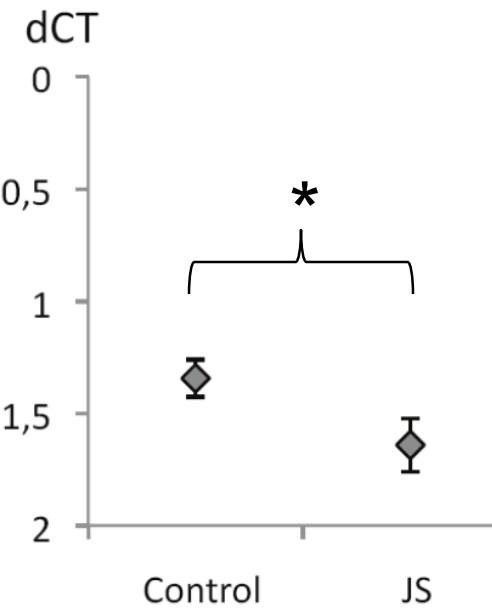
Glutamine supplementation recovers LTP in JS animals, likely by recovering a defective GABAergic transmission.



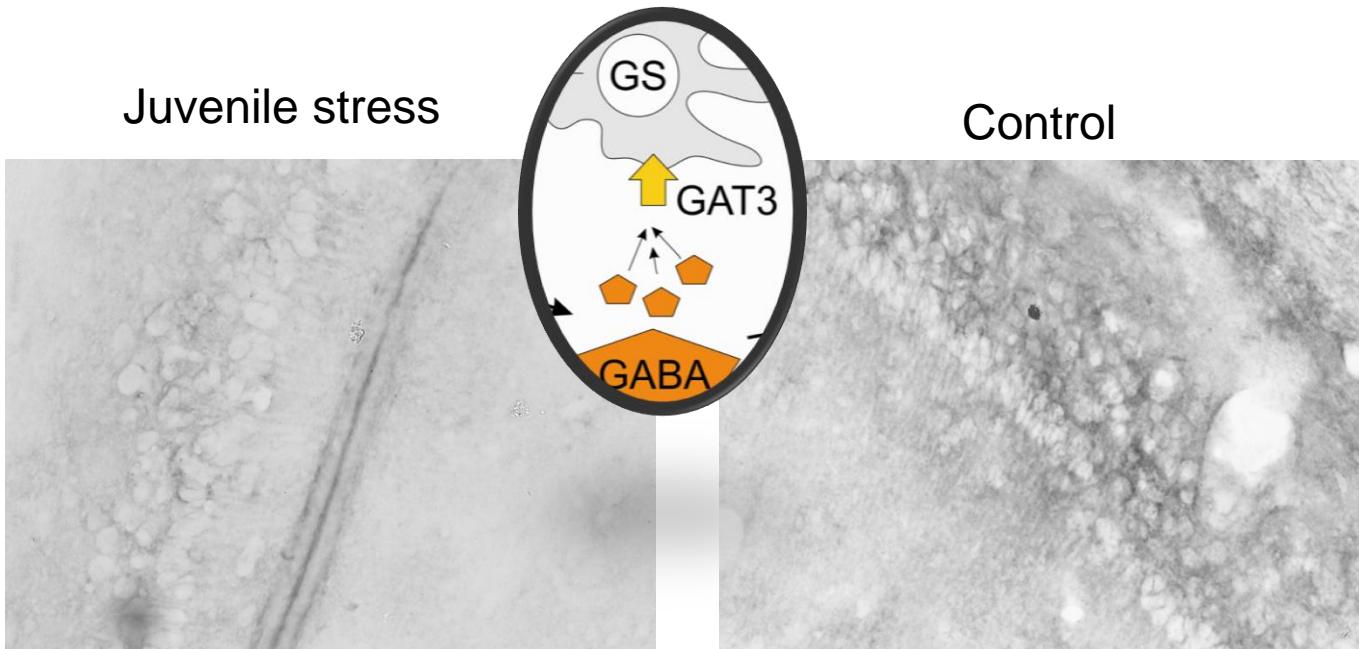
Glutamine corrects the E:I ratio in JS animals, likely by supporting inhibition

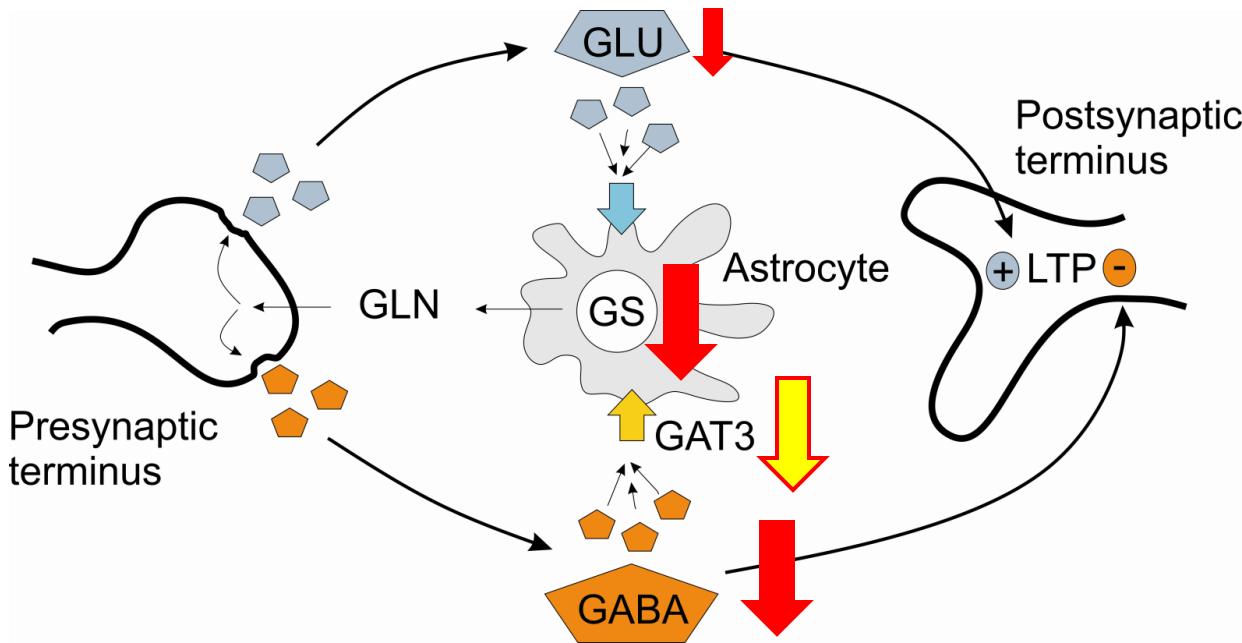


Glutamine synthetase (GS) RNA downregulation in juvenile stress.



Downregulation of the **GABA** transporter (GAT3) as consequence of juvenile stress.





How do you explain GAT3 downregulation?



Συμπεράσματα

- Κατά την μετατραυματική παιδική διαταραχή παρατηρείται **αύξηση** της συναπτικής διεγερσιμότητας.
- Σημαντικό ρόλο παίζουν τα **αστροκύτταρα** μέσω της γλουταμινικής συνθετάσης
- Ενδειξεις έλλειψης GABA ως αιτίας της αυξημένης διεγερσιμότητας



Thanks for attending

Η εργασία αυτή αποτελεί προϊόν συνεργασίας μεταξύ των Ivens S^{1,2}, Albrecht A^{3,4,5}, Caliskan G², Richter-Levin G^{4,5}, Cesetti T⁶, Kann O⁶, Stork O³ και Heinemann U², στον οποίο αποδίδεται η οργάνωση και η επικοινωνία της ερευνητικής ομάδας. Τη συντακτική επιμέλεια της περίληψης είχε ο φίλος και συνεργάτης Α Ζούμπος.

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