PRENUEROAL NETS COODINARTION OF SALIENCE:

A vital additional to the the clarion computational model

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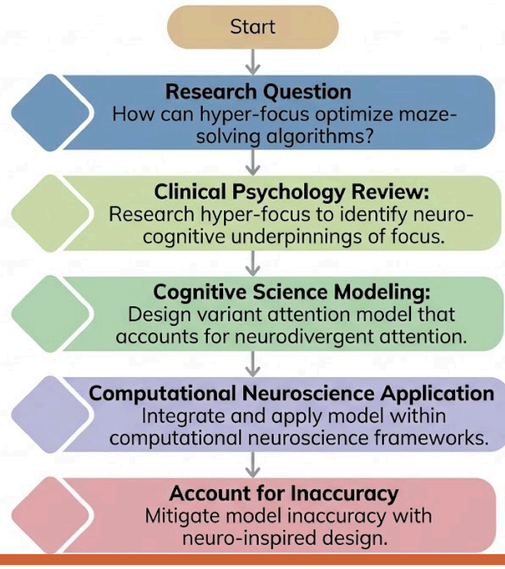
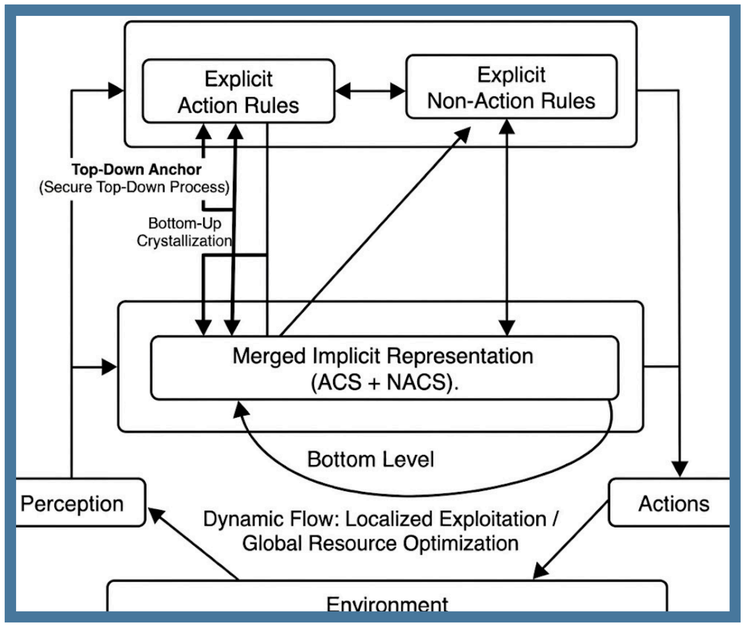
Importance of study:

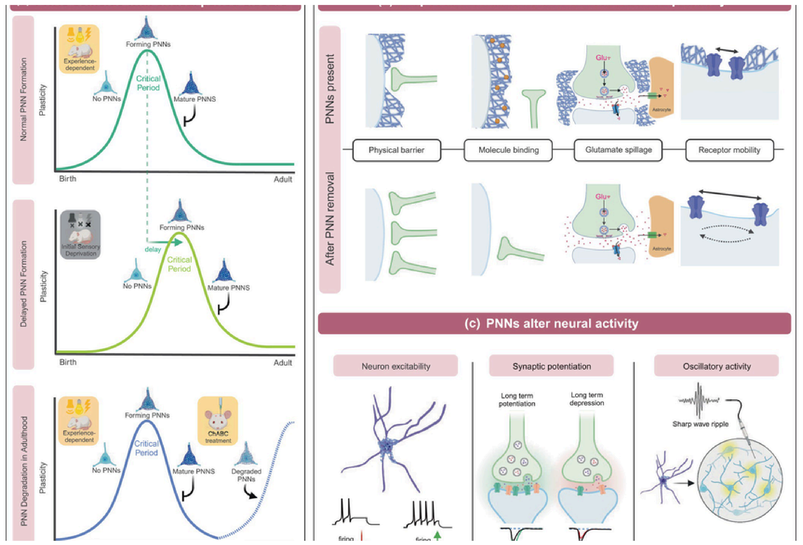
Improving computational models of salience provides a direct pathway to observing and treating neurological abnormalities. By integrating Perineuronal Nets (PNNs), these models more accurately reflect how the brain manages salience through high-level modular connectivity and structural stability.

Methods: Integrative review approach:

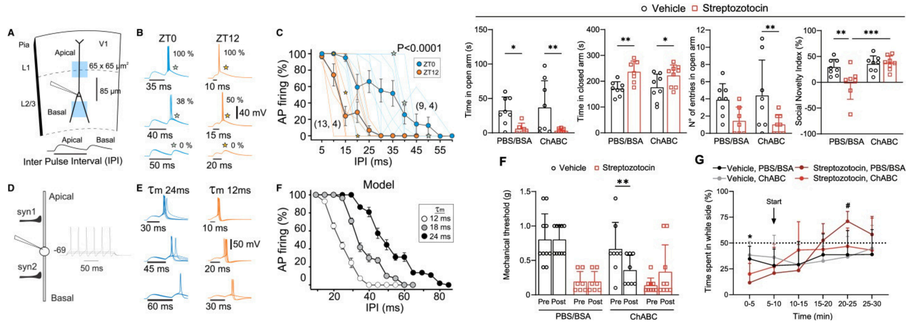


PNNs act as a glue that locks successful neural patterns into a high-speed, permanent autopilot. These locked patterns automatically trigger and anchor themselves to top-level rules, ensuring the original logic remains stable. This streamlining allows the brain to run routine tasks instantly at the bottom level, freeing up the higher levels to focus entirely on complex strategy and new challenges.





PNNs physically lock existing synapses to end critical periods, stabilizing established connections while blocking new ones. They precisely regulate firing by controlling glutamate and receptor mobility, which eliminates signal noise to ensure high-speed accuracy. This structural crystallization facilitates synaptic strengthening and coordinates the neural oscillations required for efficient, automatic processing.



a) Increasing the membrane time constant (tm) allows neurons to integrate staggered inputs over a wider window, which compounds over time to structurally "lock in" successful pathways and streamline daily processing through more reliable, high-speed communication.

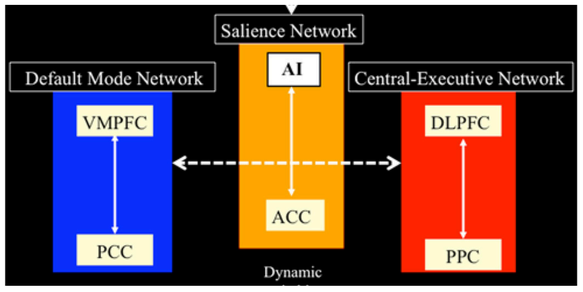
b) PNNs p precisely regulate firing by controlling glutamate and receptor mobility, which eliminates signal noise to ensure high-speed accuracy. This structural crystallization facilitates synaptic strengthening and coordinates the neural oscillations required for efficient, automatic processing.

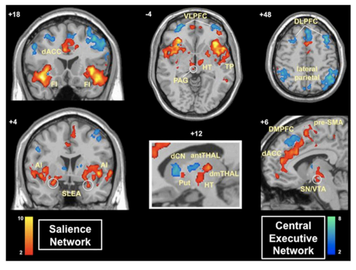
Discussion:

- Neurodivegent profiles have an abornal salience actovation that can be repersented through the DMN-TPN network switch
- Robert Sun's Clarion Model Pyclarion library accuretly model salience and hyperfocus, but do not account for salience as a dynamic process.
- can be simulated to make the process dynamic.

Future plans:

- Try to replicate clinically studied salience phenomena such as the Drift Diffusion Model (DDM).
- Refine the PNN-informed computational model
- Accounting for energy availibility effects on PNN and salience.





The Salience Network uses the anterior insula and cingulate cortices to detects environmental importance and directly couples limbic reward structures to motor regions to transform passive processing into immediate, interconnected action.Read more about this is modeled for neurodivergent populationd using the QR code.