BORAN CUI

Research Profile

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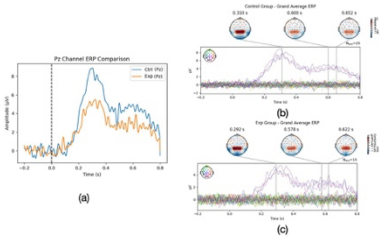
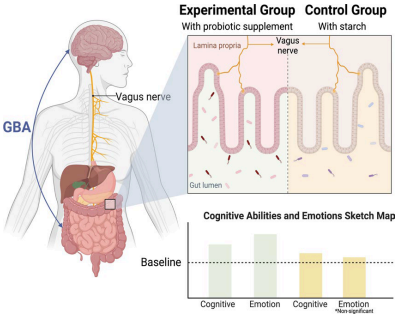
PUBLISHED PAPER



The Heart's Eye: How Mental Imagery Influences Romantic Emotion

*Boran Cui *, Yulin Kong, Weibo Zhang*
Frontiers in Psychology (2025) ***SSCI Journal***

Comparing vivid imagers and aphantasics with questionnaires, EEG, and HRV during a romantic imagery task, vivid imagery produced stronger neural (P3/LPP, reduced occipital alpha) and autonomic responses; aphantasia showed muted embodiment. Vivid visual imagery appears to amplify romantic emotional intensity and duration.

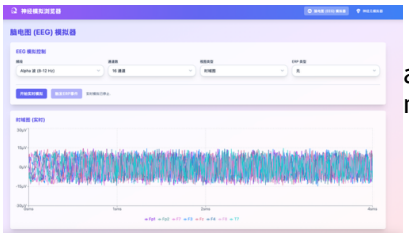


Probiotics Impact on Cognitive Ability and Emotions in Adolescents: A Brain-Gut Axis Study

*Boran Cui, Zhenxiong Wen, Yuhan Zhang, Weibo Zhang **
Academic Journal of Medicine & Health Sciences (2025)

Randomized, double-blind controlled study examined how probiotics influence adolescents' cognition and emotions via the gut-brain axis. Fifteen participants aged 15–18 were assigned to either a probiotic or placebo group for four weeks. Pre- and post-assessments using PANAS and MoCA showed that the probiotic group demonstrated notable cognitive gains and increased positive affect, while the control group showed no significant change. These findings suggest probiotics may support cognitive and emotional health in adolescents, though larger studies are needed to validate efficacy.

RESEARCH PROJECTS



EEG Simulator
Lead Developer
Jun 2025 - Oct 2025

A research-grade platform for realistic EEG signal simulation and analysis, enabling algorithm testing and training in computational neuroscience.

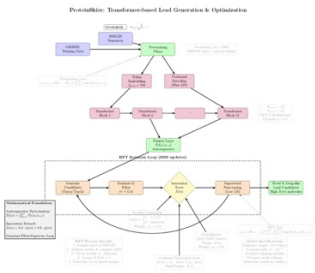
- Realistic EEG signal generation
- Multiple brain state simulations
- Advanced signal processing tools
- Research-grade accuracy

ProteinDance
Lead AI Developer
Mar 2025 - Current

PREPRINT: https://borancui.site/ProteinDance.pdf

An AI-powered biopharmaceutical platform for protein structure prediction and high-throughput drug screening, integrating docking and bioinformatics pipelines.

- AI-driven protein structure prediction
- High-throughput drug screening
- Molecular docking simulation
- Bioinformatics data integration



ProteinSkier

Research Lead, Core of ProteinDance

A GPT-2–based protein language model for function prediction, novel sequence generation, and assisting drug-molecule design. **Jan 2025 - Current**

- GPT-2–based protein LM
- Protein function prediction
- Novel protein sequence generation
- Drug molecule optimization assistance

RESEARCH EXPERIENCE

Research Intern — Tumor Microenvironment & Natural Compounds

Institute of Biophysics, Chinese Academy of Sciences

Jun 2025 - Jul 2025

- Performed MTT assays on CAF viability under MPSSS
- Conducted Annexin V/PI flow cytometry for apoptosis characterization
- Designed and executed RNA to cDNA qPCR workflow validating MPSSS-mediated Ets1 downregulation
- Analyzed immune-suppressive signaling implications; visualization via GraphPad

Research Intern — Reproductive Medicine

Peking University Third Hospital

Sep 2025 - Current

- Practice common experimental methods such as Western Blot, qPCR, and cell reproduction etc.
- Based on the background of neuroscience, a report and review on the circadian rhythm of melatonin in the cumulus-oocyte complex are presented.

"Artificial Evolution" Winter Camp

School of Life Sciences, Tsinghua University

Feb 2024

- Trained in fundamental C. elegans handling: isolation, morphological identification, culture maintenance
- Performed fluorescence/confocal microscopy to visualize neuronal synapses; observed dynamic synaptic activity labeled by fluorescent reporters
- Introduced to high-resolution imaging pipelines and quantitative analysis for behavioral/neuronal phenotype assessment

Qinghe Program

Beijing Municipal Education Commission and several universities

Summer 2023

- Studied adolescent internet-addiction formation mechanisms from behavioral, psychological, and commercial-environment perspectives
- Conducted literature survey across psychology & neuroscience; summarized competing theories on reward circuitry and compulsive behavior
- Gained foundation in psychological research paradigms — sampling design, confound control, ethics, and early-stage hypothesis refinement