## **Dynamic Causal Tractography Atlas**

Kanno et al. <sup>1)</sup> built an atlas from **epilepsy patients undergoing invasive monitoring** — a biased population with pathological connectivity. The claim to model "normal" speech dynamics at a whole-brain scale is unjustified.

Pathological brains cannot define normal cognition.

—- The paper overemphasizes "millisecond-scale" insights. But **high-gamma temporal correlation** does not imply causality. There is **no causal manipulation** to verify necessity.

High frequency  $\neq$  high certainty.

—- "Fasciculus engagement" is assumed, not demonstrated. There is **no diffusion-based confirmation**, histological correlation, or anatomical dissection. Terms like "fasciculus" are used **loosely and inconsistently**.

Buzzwords ≠ biological accuracy.

—- Correlations up to rho = 0.82 and p-values <  $10^{-14}$  sound impressive, but remain **purely observational**. Without experimental control, the conclusions are speculative at best.

Big data + small  $p \neq$  causality.

—- No decision algorithm. No case outcomes. No proof of surgical utility. Despite flashy visuals, **there's no pathway from data to improved neurosurgical care**.

Surgeons need tools, not tractography-themed TED Talks.

—- Despite a large cohort, **individual differences are not analyzed**. Lumping patients into average maps erases the very complexity that functional neurosurgery must preserve.

## Final Verdict

This is **neuroglamour**, not neuroscience. Technically brilliant, but conceptually superficial and **clinically irrelevant** in its current form.

An atlas of elegant noise.

--- Tags: epilepsy, speech mapping, tractography, critical review, cognitive bias

1)

Kanno A, Kochi R, Sakakura K, Kitazawa Y, Uda H, Ueda R, Sonoda M, Lee MH, Jeong JW, Rothermel R, Luat AF, Asano E. Dynamic Causal Tractography Analysis of Auditory Descriptive Naming: An Intracranial Study of 106 Patients. Neuroimage. 2025 Jun 12:121319. doi:

## 10.1016/j.neuroimage.2025.121319. Epub ahead of print. PMID: 40516665.

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