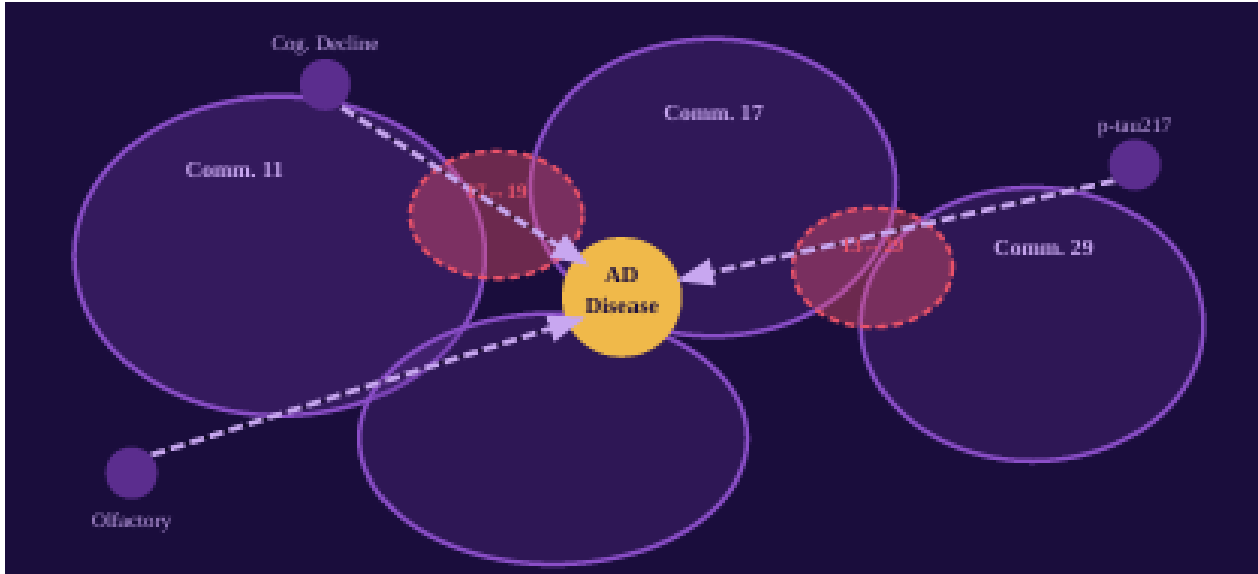
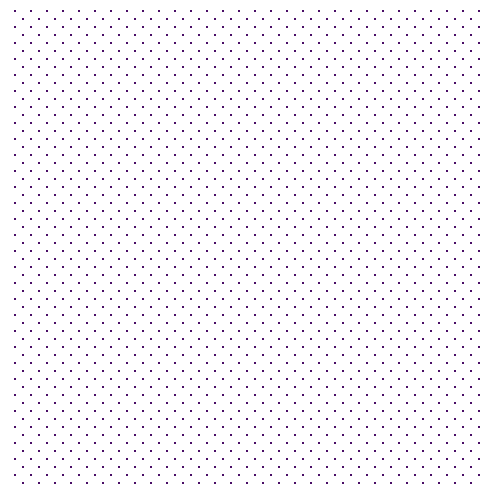


Prioritizing Biomarkers and Clinical Targets in Alzheimer's Disease Using a Knowledge Graph-Based Semantic Framework

Abstract #13915

Jesus Domech More | AAIC 2026 · Developing Topics: Biomarkers · Exhibit Hall · In-Person Poster · July 12, 2026

A graph-based semantic potential framework transforms a static Alzheimer's knowledge graph into an actionable exploration map, pinpointing the biomarkers, clinical targets, and cross-domain frontiers most likely to yield new discoveries.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
From Static Graphs to Actionable Exploration Alzheimer's disease research is characterized by fragmentation across molecular, biomarker, imaging, and clinical domains. While knowledge graphs integrate heterogeneous data, most applications remain static and do not guide where exploration should be prioritized. There is a critical need for methods that can transform integrated knowledge structures into actionable exploration strategies.	Semantic Potential Layer Scalar Semantic Potential: $\varphi(v) = f(E, C, M, T, U)$ E — Evidence strength · C — Graph centrality · M — Mechanistic coherence · T — Translational relevance · U — Uncertainty Graph Scale 697 nodes · 753 edges · 100 regions	Node Level — Top-Ranked Semantic Anchors - Alzheimer's Disease — central anchor - Amyloid PET — imaging biomarker - Baseline — temporal structure - Cognitive decline — clinical measure - Follow-up — temporal structure - Plasma p-tau217 — fluid biomarker Region Level — High-Priority Semantic Regions Community 11: highest exploration priority index. Interface 17<->19: cross-domain biomarker frontier. Interface 19<->29: cognitive-temporal boundary. Interfaces 13<->17 and 13<->29: mechanistic integration zones Gradient Traversal — Knowledge-Gain Trajectories Gradient-guided traversal identified interpretable ascent paths from frontier nodes to high-value cores: Olfactory Identification → Alzheimer's Disease (high gain); Cognitive decline → Baseline (high gain). These paths represent strong semantic ascent, suggesting candidate routes for targeted hypothesis generation and cross-domain exploration.	An evidence-linked AD knowledge graph can be transformed into a semantic landscape capable of guiding exploration prioritization. By integrating evidence, structural properties, and translational relevance, this approach identifies high-value biomarkers, clinical targets, and frontier regions where knowledge integration is most needed — supporting more efficient hypothesis generation and improved biomarker integration in translational AD research.	Source corpus and full evidence linkage tables available upon request from the authors  CONTACT  Jesus Domech More AAIC 2026 · Developing Topics: Biomarkers Exhibit Hall · In-Person Poster Abstract #13915 