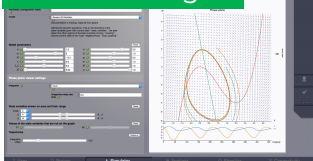# Human Brain Project

Co-Design Project 8 The Virtual Brain (TVB):
Interfacing The Virtual Brain with HBP Platforms

The Virtual Brain now

TVB is a neuroinformatics platform that embeds a simulation engine for mathematical models that simulate the dynamics of brain activity.
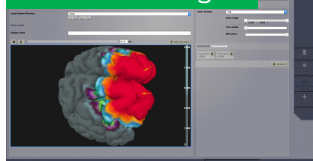
Neuroinformatics Platform
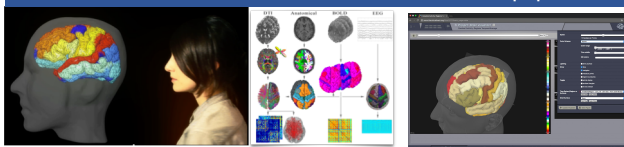
Simulation engine

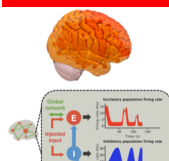**Visualization engine**

Stimulation engine

Analysis engine

Personalized brain model construction pipeline

Results for basic science and clinics

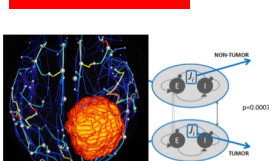**Multi-scale mechanisms**

Epilepsy
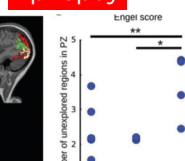
Brain Tumors
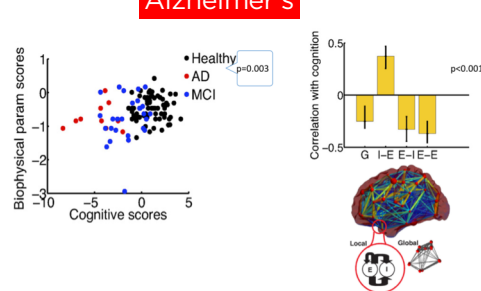
Stroke
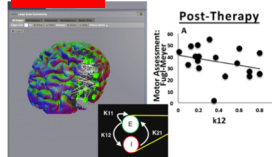
Alzheimer's

Mouse
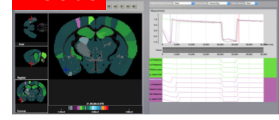
The Virtual Brain & HBP in future

BSP-TVB interface: for multiscale brain simulation

nest::

THEVIRTUALBRAIN.

nm ———————————————— cm

Multicompartment neurons

Small networks

Mesoscopic network motifs

Neural mass models

Surface simulation

Full-brain network models

Knowledge Graph Search

FENIX RESEARCH INFRASTRUCTURE

JÜLICH FORSCHUNGSZENTRUM
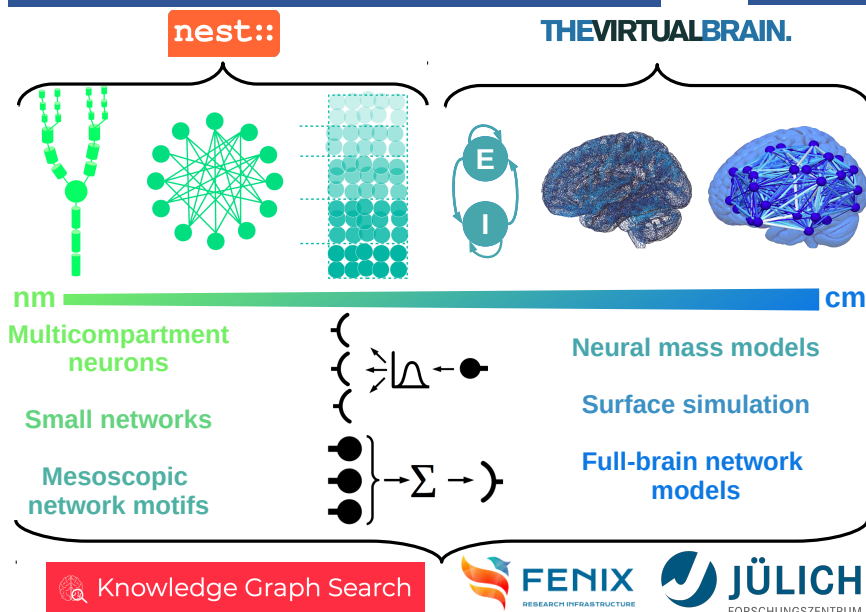
### NIP-TVB interface: Processing pipelines, repositories, atlases

TVB's GUI and Python programming interface embedded in HBP's NIP for brain model construction | simulation | post-processing | analysis | visualization

State-of-the-art image processing | atlas-based region-mapping | annotation | connectome extraction

Findability of brain models | simulation results | parameter libraries | dynamical regimes | disease conditions with HBP's KnowledgeGraph

Neuroanatomical constraining of brain models with quantitative cytoarchitectonic atlases like HBP's Big Brain | JuBrain | 3d von Economo and Koskinas | Waxholm | Allen Mouse Brain

Ready-to-use connectomes | biomarkers | demographics for hundreds of thousands of healthy subjects & patients across lifespan

HUMAN Connectome PROJECT

biobank uk
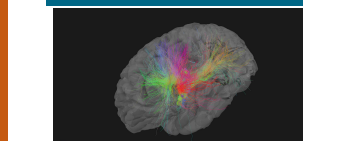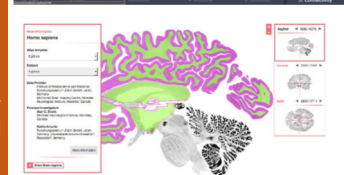
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THEVIRTUALBRAIN.