

Neuroscience Information Framework

<http://neuinfo.org>

The Neuroscience Information Framework (NIF), an initiative of the NIH Blueprint for Neuroscience Research, is a semantically-enhanced portal to web-based neuroscience resources: data, materials, and tools. NIF has developed search tools, which expose the contents of federated databases and deep or “hidden” web resources hidden from traditional search engines. NIF is designed to serve the neuroscience research community and is actively looking for resource providers to make their resources accessible through NIF.

NIF allows you to find information and data from hundreds of neuroscience sources...

NIF Neuroscience Information Framework

ABOUT RESOURCES DATA

Data

"Purkinje Cell"

Show me everything (45,792)

Showing 45,792 RESULTS ACROSS 72 DATA SOURCE(S) WITH THE Query Expansion ▾

What are you searching for?

Physical Resource or Software Tool (0)

Data or Model (229)

Funding (0)

Information (0)

Other (0)

Show me everything (45,792)

Categories

Antibody (0)	Cell (47)	Cell Part (159)	Clinical Trials (0)	Connectivity (0)
Disease (0)	Expression (0)	Function (194)	Gene (0)	Grants (0)
Gross Anatomy (0)	Images (0)	Models (229)	Molecule (141)	Multimedia (0)
Organism (0)	Phenotype (0)	Software (0)	Training (0)	

Model Name Model Concept Software Type Type Neurons Neurotransmitters Receptors

Controlling Calcium dynamics NEURON Dendrite Cerebellum purkinje cell

Parallel Bursting, Reaction-diffusion, Calcium dynamics, Methods STEPS Cerebellum purkinje cell

Vestibulo-Ocular Reflex model in Matlab (Clopath et al. 2014) Synaptic Plasticity MATLAB Realistic Network Cerebellum purkinje cell

Effect of voltage sensitive fluorescent proteins on neuronal excitability (Akkermann et al. 2009) NEURON Neuron or other electrically excitable cell Cerebellum purkinje cell

Stochastic calcium mechanisms cause dendritic calcium spike variability (Anwar et al. 2013) Dendritic Action Potentials, Active Dendrites, Calcium dynamics STEPS (web link to model) Neuron or other electrically excitable cell, Dendrite Cerebellum purkinje cell AMPA

swagger /swagger-docs/swagger.json Explore

SciCrunch API Docs ⓘ

[Base url: /api/v1]
/swagger-docs/swagger.json

API endpoints for [scicrunch.org](#), [dknet.org](#) and [neuinfo.org](#). All API calls require the 'key' field to be set with an API key

Data services

GET /dataservices/federation/data/{viewid}	search a single data view
GET /dataservices/federation/search	search all data views
GET /dataservices/federation/facets/{viewid}	get facets for a data view
GET /dataservices/literature/search	search the Pubmed literature
GET /dataservices/literature/pmid	retrieve by PMID

Access information or integrate information into your application or scripts via NIF provided services after registering for an API Key

Searching a diverse set of resources and making the search results intelligible are major challenges. NIF utilizes many advanced features for information retrieval and integration. Chief among these is the use of a shared vocabulary, InterLex (formerly NeuroLex) and the NIF Standard Ontology, for describing and querying resources. InterLex currently consists of thousands of concepts derived from community-built ontologies and vocabularies and enhanced through the input of neuroscience experts. Through intuitive query interfaces, users can make use of the InterLex vocabularies to expand or refine their search and to perform so-called "concept-based queries." Through a single interface, users can search across multiple information sources.

NIF is releasing new terminology tools and services

Term View

Home / Term Dashboard / ILX:0101974

Cerebellum Purkinje cell 
http://uri.interlex.org/base/ilx_0101974



Log in to suggest term to community

 Back to search results
+ Add new term

Export:   

PreferredId: ILX:0101974 Type: term OWL Equivalent: owl:Class

Principal neuron (projection neuron) of the cerebellar cortex; cell bodies arranged in a single layer; characterized by a pear-shaped cell body, 1 (rarely 2) primary dendrites and an elaborate dendritic tree heavily invested with dendritic spines.

Version: 1

General

Children

Relationships

Annotations

Referenced By

Superclasses:

 Expand list

Cerebellum Purkinje cell

↓

Neuron

↓

Nervous system cell

↓

Cell

↓

Anatomical entity

Synonyms:

Synonym

Type

Purkinje neuron

Purkinje's corpuscles

Cerebellar Purkinje neuron

Purkinje Cell

Purkyne cell

Corpuscles of Purkinje

Existing IDs:

Preferred CURIE

IRI

NLXWIKI:sao471801888 <http://neurolex.org/wiki/sao471801888>

ILX:0101974 http://uri.interlex.org/base/ilx_0101974

InterLex was built on the foundation of NeuroLex (see Larson and Martone 2013). The initial entries in NeuroLex were built from the NIF Standard ontologies which currently has about 60,000 concepts (includes both classes and synonyms) that span gross anatomy, cells, subcellular structures, diseases, functions and techniques. InterLex models terms using primitives of the Web Ontology Language (OWL) and can export directly to a variety of standard ontology formats.

Access the NIF ontology or integrate the NIF ontology into your application or scripts via NIF provided services after registering for an API Key

InterLex is a dynamic lexicon of biomedical terms that is being constructed to help improve the way that biomedical scientists communicate about their data, so that information systems can find data more easily and provide more powerful means of integrating data across distributed resources. One of the big roadblocks to data integration is the inconsistent use of terminology in databases and other resources such as the literature. InterLex allows for the association of data values (i.e. the value of a field or text within a field) to terminologies enabling the crowdsourcing of data-terminology mappings within and across communities.

SciGraph - REST Services

graph : Graph services

Show/Hide | List Operations | Expand Operations | Raw

refine : OpenRefine Reconciliation Services

Show/Hide | List Operations | Expand Operations | Raw

analyzer : Analysis services

Show/Hide | List Operations | Expand Operations | Raw

cypher : Cypher utility services

Show/Hide | List Operations | Expand Operations | Raw

annotations : Annotation services

Show/Hide | List Operations | Expand Operations | Raw

lexical : Lexical services

Show/Hide | List Operations | Expand Operations | Raw

vocabulary : Vocabulary services

Show/Hide | List Operations | Expand Operations | Raw

GET /vocabulary/categories

Get all categories

GET /vocabulary/search/{term}

Find a concept from a term fragment

GET /vocabulary/prefixes

Get all CURIE prefixes

GET /vocabulary/suggestions/{term}

Suggest terms

GET /vocabulary/id/{id}

Find a concept by its ID

GET /vocabulary/autocomplete/{term}

Find a concept by its prefix

GET /vocabulary/term/{term}

Find a concept from a term

NIF assists users in finding scientific resources

The screenshot shows the NIF website interface. At the top, there's a navigation bar with links for ABOUT, RESOURCES (which is currently selected), DATA, LITERATURE, and MY ACCOUNT. Below the navigation is a search bar with the query "Simulation". A sidebar on the left contains links for Category Graph, Create New Collection, Add All On Page To A Collection, Filter By Last Modified Time, and See New Records. The main content area displays search results for "Simulation", showing two entries: "Multiscale Object Orientation Simulation Environment" and "Multi Simulation Coordinator". Each entry includes a link to its details page. A large blue arrow points from the sidebar down to the "Resource Details" section of the Multiscale Object Orientation Simulation Environment page. This page provides detailed information about MOOSE, including its URL (<http://moose.sourceforge.net/>), a brief description, and a "Subscribe to new mentions" button. At the bottom of this page, there are tabs for INFORMATION, RELATIONSHIPS, REFERENCED BY, ANALYTICS, and SOURCE, along with sections for Keywords, Resource ID, Alternate IDs, and Website Status.

The resource registry within NIF holds the largest collection of scientific resources, such as simulation environments. Resources are manually curated to make sure the information is accurate. Using NLP techniques we also look for literature mentions of resources in full text articles we have access to. This allows the registry to provide information on related resources and suggest other interesting resources.

This screenshot shows the NIF Literature page for the article "STEPS: Modeling and Simulating Complex Reaction-Diffusion Systems with Python". The page includes social sharing icons (Facebook, Twitter, LinkedIn), a summary of the article, and sections for INFORMATION, TERMS OF USE, and TOOLS AND RESOURCES. The INFORMATION section contains links to research resources used in the publication (none found), research tools detected (SourceForge, SBML, Multiscale Object Orientation Simulation Environment, CellML), data used (none found), and associated grants (None). The TERMS OF USE and TOOLS AND RESOURCES sections are also visible. A "Related publications" section at the bottom lists several papers, with a blue arrow pointing to the first item in the list: "STEPS: efficient simulation of stochastic reaction-diffusion models in realistic morphologies. (Hepburn | 2012)".

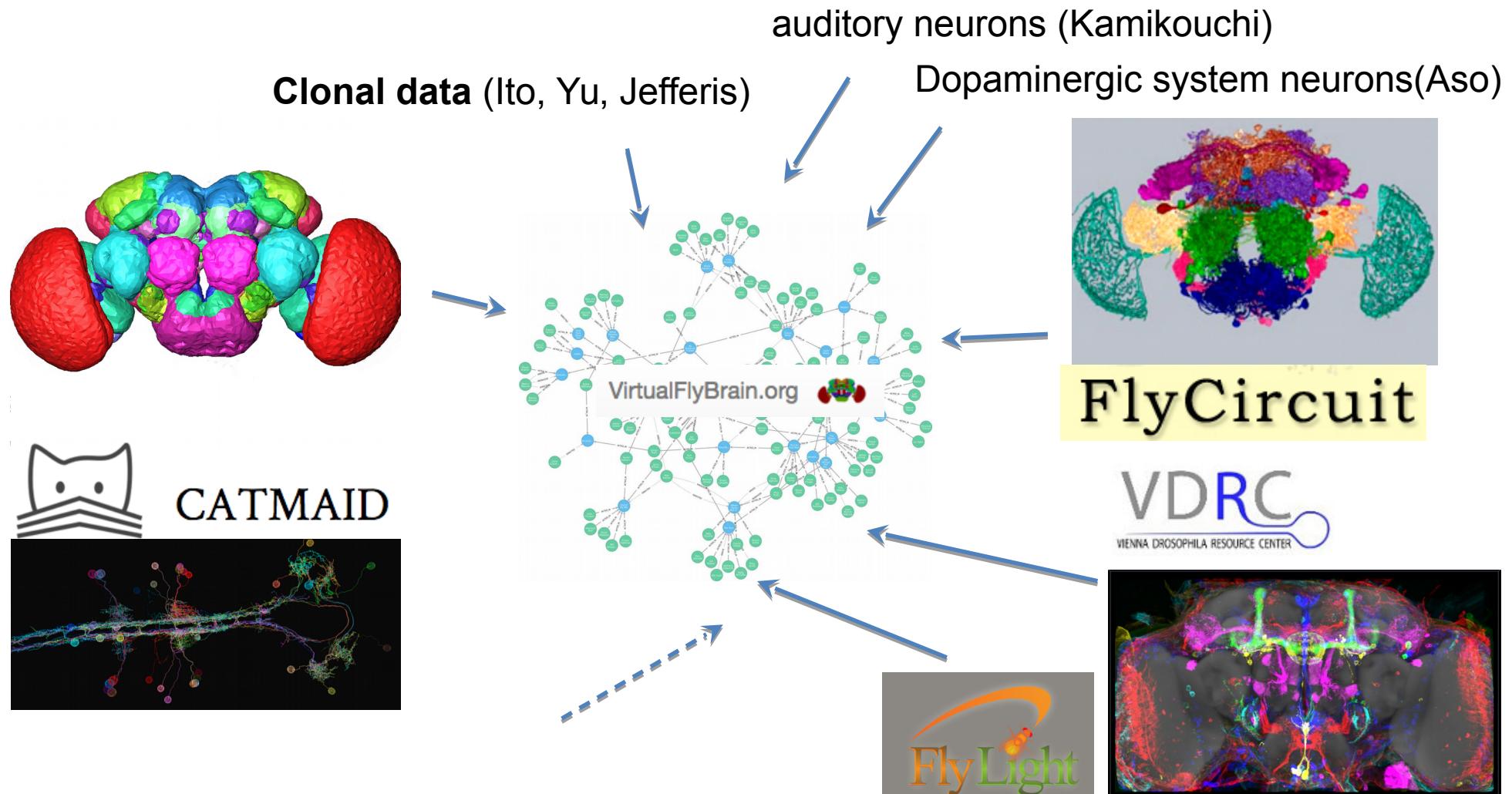
Access resource information or integrate resource information into your application or scripts via NIF provided services after registering for an API Key

Virtual Fly Brain

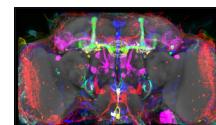
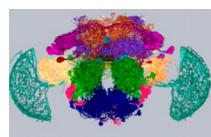
<https://www.virtualflybrain.org>

A data integration hub for *Drosophila* neurobiology, integrating disparate, large-scale datasets and linking them to curated literature and other resources. VFB provides the data to generate circuit hypotheses and identify research tools to test them.

Combining 3D Anatomy, Light & EM Image Data



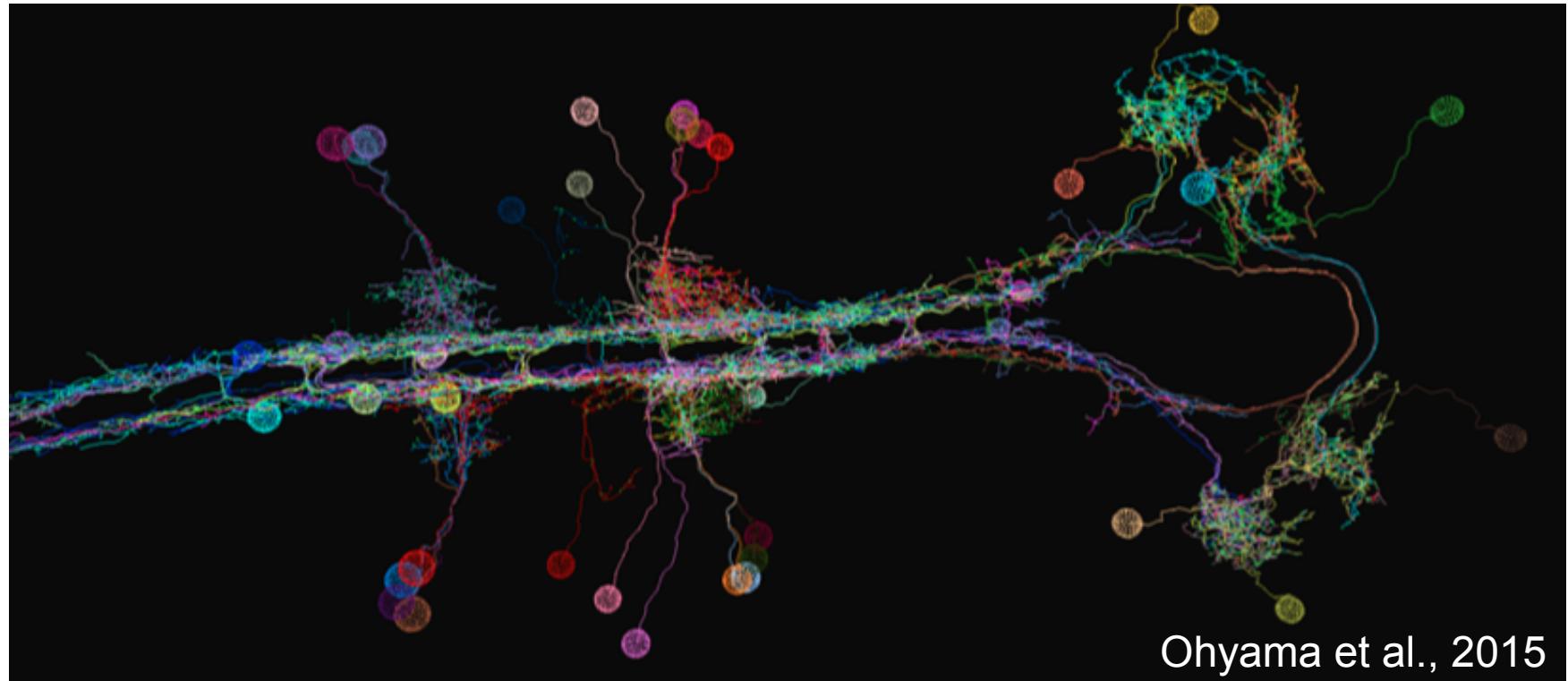
with semantic integration: image annotation



OWL individual annotation

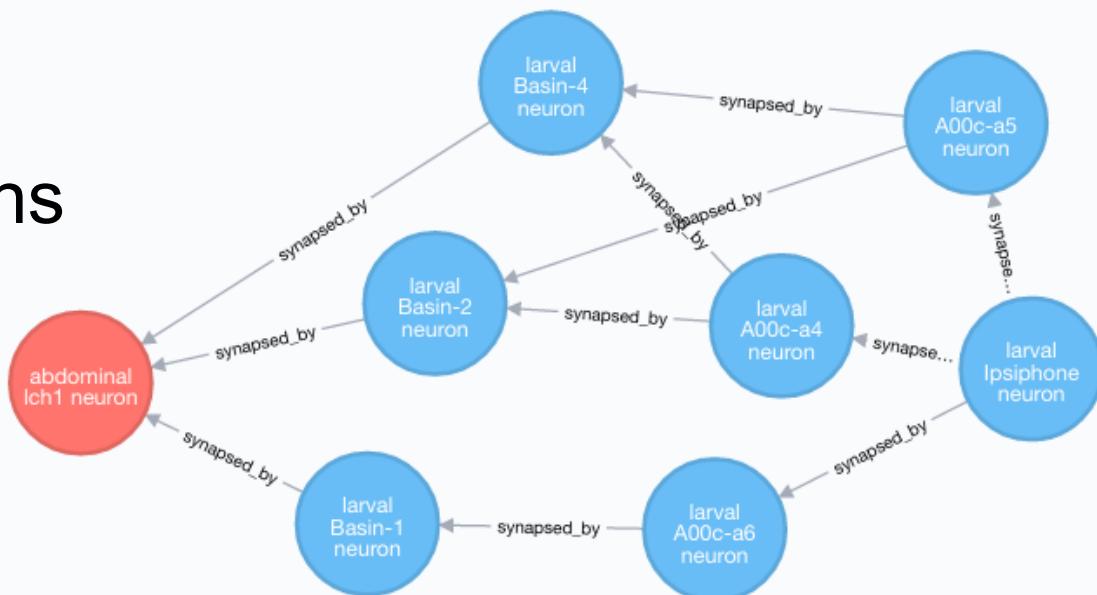
OWL2
W3C®
neo4j

VFB 2 – interactive 3D circuit reconstructions



Context graphs:
Exploring circuit paths

Query: circuit paths from
'abdominal vch1 neuron' to
'larval Ipsiphone neuron'



Value added by VFB

OWL-based approach

- › scalable, queryable integration of knowledge and data about *Drosophila* neuroanatomy

Knowledge curated from the literature

- › context and queryability to bulk data

Tight integration with FlyBase

- › Expression
- › Phenotypes

Planned collaboration with EBI

- › integration transcriptomic data

Nblast

- › find morphologically similar neurons
- › find potential driver lines for a specific neuron

Direct API's to query data.

HBP Collaboratory

<http://collab.humanbrainproject.eu>

The HBP Collaboratory collects tools from the HBP Platforms in one place and allows you to organize them into your own collaborative workspace or *collab*.

The HBP Collaboratory is your virtual lab bench

Explore, Work, Collaborate, Organize

- **Explore** the HBP Platform ecosystem
- **Work** with integrated web accessible scientific tools to analyze, visualize and share data.

- **Collaborate** by adding team members to your collab to gain insights outside your areas of expertise
- **Organize** your work with tools from the HBP Platforms integrated in the Collaboratory

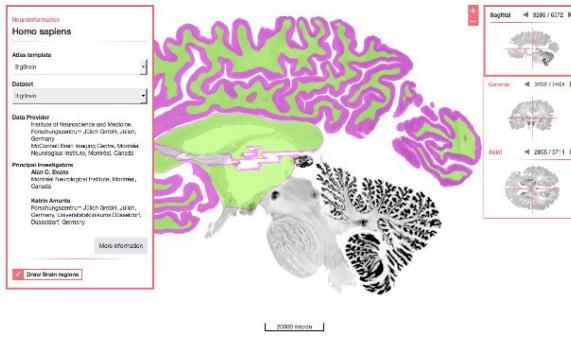
The screenshot displays the HBP Collaboratory interface across three main sections:

- Software Catalog:** On the left, a sidebar lists various categories like Getting Started, Software Catalog (which is selected), Create a Collab, etc. The main workspace shows a list of software libraries, each with a thumbnail, name, type (e.g., library), version, and date. Examples include "Deflect Client Library", "AnaRM (Analog Readout Module)", "Basic software libraries for the I", "Logging Framework for UHEI Sc", "Low-level Interface for (USB-based) Spikes", "3DSynapsesSA", "SynapseGenerator", "Neuromorphic Platform Python", "PyNN", and "3DSomaMS".
- Workspace:** In the center, a workspace area features a toolbar with buttons for Edit, Insert, Cell, Kernel, Help, and Markdown. Below the toolbar, a "requirements installation" section contains a code editor with Python commands for pip installations. The output pane shows errors related to finding .egg-info directories. A "Circuit Building Pipeline" tab is also visible.
- Collaboratory Home:** On the right, a sidebar shows navigation links for Product, Team, Archives, New UI Proposal, HBP Roles, Software Catalog Admin, Meetings, Events, Settings, and Stats. It also includes sections for Team Members, Storage, and a "CellToolbar" button.

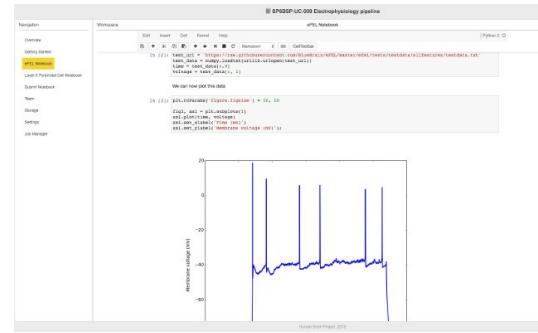
Explore and *Use* the HBP Platform Ecosystem

Federated across Europe, the HBP Platforms provide strategic tools in:

Neuroinformatics



Brain Simulation



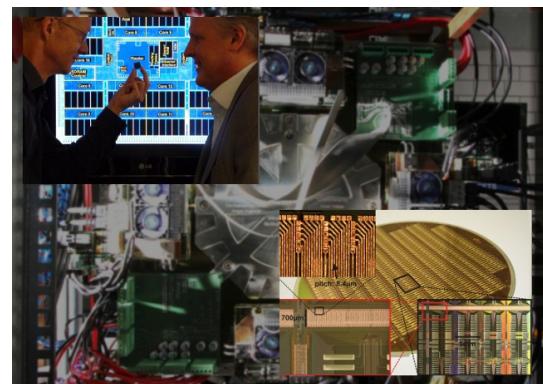
Medical Informatics



High Performance Analytics and Computing (HPAC)



Neuromorphic Computing



Neurorobotics



Getting Access

To access the HBP Collaboratory you need an **HBP Identity account**.

Information on how to request an account can be found here:

<https://www.humanbrainproject.eu/en/hbp-platforms/getting-access/>

With a basic HBP Identity Account you can access:

- HBP Collaboratory:
- Browse Platform collabs
- Browse HBP Collaboratory public collabs
- Add files to public collabs where the user is a member
- **Create public collabs** and populate them with content
- Create public **Jupyter notebooks** and edit them
- Can be added to private collabs by collab owners

platform@humanbrainproject.eu