

Resource Summary Report

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Computational Neurobiology and Imaging Center

RRID:SCR_013317

Type: Tool

Proper Citation

Computational Neurobiology and Imaging Center (RRID:SCR_013317)

Resource Information

URL: <http://research.mssm.edu/cnic/>

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Description: Center to advance research and training in mathematical, computational and modern imaging approaches to understanding the brain and its functions. Software tools and associated reconstruction data produced in the center are available. Researchers study the relationships between neural function and structure at levels ranging from the molecular and cellular, through network organization of the brain. This involves the development of new computational and analytic tools for imaging and visualization of 3-D neural morphology, from the gross topologic characteristics of the dendritic arbor to the fine structure of spines and their synapses. Numerical simulations of neural mechanisms based on these structural data are compared with in-vivo and in-vitro electrophysiological recordings. The group also develops new theoretical and analytic approaches to exploring the function of neural models of working memory. The goal of this analytic work is to combine biophysically realistic models and simulations with reduced mathematical models that capture essential dynamical behaviors while reproducing the functionally important features of experimental data. Research areas include: Imaging Studies, Volume Integration, Visualization Techniques, Medial Axis Extraction, Spine Detection and Classification, Applications of Rayburst, Analysis of Spatially Complex Structures, Computational Modeling, Mathematical and Analytic Studies

Abbreviations: CNIC

Resource Type: data or information resource, data set, portal, software resource, topical portal

Keywords: brain, confocal, in-vitro, in-vivo, microscopy, morphology, morphometric, multi-photon, neural, neural function, neuron, simulation, stack, structure, synapse, topologic, variable, vessel, visualization, image, neuroscience, neurobiology, reconstruction, modeling, spatial, rayburst, spine, arbor, visual, tiling, imaging

Related Condition: Aging

Funding: Howard Hughes Medical Institute ;
NIDCD ;
NIA ;
NIMH

Resource Name: Computational Neurobiology and Imaging Center

Resource ID: SCR_013317

Alternate IDs: nif-0000-10200

Alternate URLs: <http://www.mssm.edu/cnic/>

Record Creation Time: 20220129T080315+0000

Record Last Update: 20260905T133005+0000

Ratings and Alerts

No rating or validation information has been found for Computational Neurobiology and Imaging Center.

No alerts have been found for Computational Neurobiology and Imaging Center.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 7 mentions in open access literature.

Listed below are recent publications. The full list is available at [PRECISE-TBI](#) .

Lee HS, et al. (2026) Zinc-Mediated Lysosomal Destabilization Links Mitochondrial Damage to Neuronal Death in a Cellular MPP+ Model of Parkinson's Disease. Journal of neurochemistry, 170(2), e70363.

Nishida R, et al. (2021) LOTUS, an endogenous Nogo receptor antagonist, is involved in synapse and memory formation. Scientific reports, 11(1), 5085.

Serita T, et al. (2019) Dietary magnesium deficiency impairs hippocampus-dependent memories without changes in the spine density and morphology of hippocampal neurons in mice. Brain research bulletin, 144, 149.

Serita T, et al. (2017) Constitutive activation of CREB in mice enhances temporal association learning and increases hippocampal CA1 neuronal spine density and complexity. Scientific reports, 7, 42528.

Sigler A, et al. (2017) Formation and Maintenance of Functional Spines in the Absence of Presynaptic Glutamate Release. *Neuron*, 94(2), 304.

Price KA, et al. (2014) Altered synaptic structure in the hippocampus in a mouse model of Alzheimer's disease with soluble amyloid- β oligomers and no plaque pathology. *Molecular neurodegeneration*, 9, 41.

Jiménez-Arellanes A, et al. (2013) Ursolic and oleanolic acids as antimicrobial and immunomodulatory compounds for tuberculosis treatment. *BMC complementary and alternative medicine*, 13, 258.