Resource Summary Report

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EONS

RRID:SCR_002979
Type: Tool

Proper Citation

EONS (RRID:SCR_002979)

Resource Information

URL: http://bmsr.usc.edu/software/eons/

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Description: Modeling platform to study the basic interactions between synaptic elements that allows the user to study qualitatively, and also quantitatively the relative contributions of diverse mechanisms underlying synaptic efficacy: the relevance of each and every element that comprises a synapse, the interactions between these components and their subcellular distribution, as well as the influence of synaptic geometry (presynaptic terminal, cleft and postsynaptic density). This platform consists of a graphical interface in which elements that comprise a single glutamatergic synapse (both pre- and post-synaptically), their behavior as well as the underlying synaptic geometry can be modified. For example, EONS offers the ability to study the effect of voltage-gated calcium channels density and distribution, the number and location of receptors and more. EONS is a parametric model of a generic glutamatergic synapse that takes into account pre-synaptic mechanisms, such as calcium buffering and diffusion, neurotransmitter release, diffusion and uptake in the cleft, and postsynaptic elements, such as ionotropic AMPA and NMDA receptors, their distribution and synaptic geometry, as well as metabotropic glutamate receptors. There are no complicated equations to write: all the models are predefined. This version is a great tool for first time users and students interested in learning about synapses, as well as for studying geometry and distribution hypotheses in a 2D rectangular geometry. System Requirements: EONS V1.2 is a Windows program but can be also successfully installed and run on Mac and Linux.

Abbreviations: EONS

Synonyms: Elementary Objects of the Nervous System, EONS-The integrated synaptic modeling platform, EONS (Elementary Objects of the Nervous System)

Resource Type: software application, software resource, simulation software

Defining Citation: PMID:17946227

Keywords: synapse, geometry, distribution hypothesis, 2d, synaptic modeling, synaptic, modeling, neuron, nervous system, presynaptic, postsynaptic, electromicrograph, animation, simulation, calcium channel, synaptic cleft, excitatory postsynaptic potential, potassium channel, computational neuroscience, java, macos, microsoft, windows, windows xp

Funding: NIBIB P41-EB001978

Availability: Free, Non-commercial

Resource Name: EONS

Resource ID: SCR_002979

Alternate IDs: nif-0000-00504

Alternate URLs: http://www.nitrc.org/projects/eons, http://synapticmodeling.com/

Old URLs: http://www.synaptic-modeling.com

Record Creation Time: 20220129T080216+0000

Record Last Update: 20250522T060057+0000

Ratings and Alerts

No rating or validation information has been found for EONS.

No alerts have been found for EONS.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 12 mentions in open access literature.

Listed below are recent publications. The full list is available at NIF.

Soyka F, et al. (2025) Action potential threshold variability for different electrostimulation models and its potential impact on occupational exposure limit values. Bioelectromagnetics, 46(1), e22529.

Chen Y, et al. (2024) Optogenetically modified human embryonic stem cell-derived otic neurons establish functional synaptic connection with cochlear nuclei. Journal of tissue engineering, 15, 20417314241265198.

Park J, et al. (2024) Multi-level, forming and filament free, bulk switching trilayer RRAM for neuromorphic computing at the edge. Nature communications, 15(1), 3492.

Gad A, et al. (2024) Associations between maternal bacteremia during the peripartum period and early-onset neonatal sepsis: a retrospective cohort study. BMC pediatrics, 24(1), 526.

James J, et al. (2021) Diagnostic Accuracy of Clinical Tool 'STOPS' and Serum Procalcitonin for Optimizing Antibiotic Therapy in Neonates Born at ? 28 Weeks of Gestation with Neonatal Sepsis. Mediterranean journal of hematology and infectious diseases, 13(1), e2021019.

Qi H, et al. (2021) Latamoxef for Neonates With Early-Onset Neonatal Sepsis: A Study Protocol for a Randomized Controlled Trial. Frontiers in pharmacology, 12, 635517.

Ratnaparkhi CR, et al. (2020) Utility of Doppler ultrasound in early-onset neonatal sepsis. The Indian journal of radiology & imaging, 30(1), 52.

Parsa M, et al. (2020) Bayesian Multi-objective Hyperparameter Optimization for Accurate, Fast, and Efficient Neural Network Accelerator Design. Frontiers in neuroscience, 14, 667.

Aydemir C, et al. (2018) The cut-off levels of procalcitonin and C-reactive protein and the kinetics of mean platelet volume in preterm neonates with sepsis. BMC pediatrics, 18(1), 253.

Brown RG, et al. (2018) Vaginal dysbiosis increases risk of preterm fetal membrane rupture, neonatal sepsis and is exacerbated by erythromycin. BMC medicine, 16(1), 9.

Allam SL, et al. (2015) Synaptic Efficacy as a Function of Ionotropic Receptor Distribution: A Computational Study. PloS one, 10(10), e0140333.

Chiesa C, et al. (2015) Early-Onset Neonatal Sepsis: Still Room for Improvement in Procalcitonin Diagnostic Accuracy Studies. Medicine, 94(30), e1230.