

Resource Summary Report

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STEPS

RRID:SCR_008742

Type: Tool

Proper Citation

STEPS (RRID:SCR_008742)

Resource Information

URL: <http://steps.sourceforge.net/STEPS/default.php>

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Description: STEPS is a package for exact stochastic simulation of reaction-diffusion systems in realistic, complex 3D geometries. Our core simulation algorithm is an efficient implementation of a variation on Gillespie's SSA, extended to deal with diffusion of molecules over the elements of a 3D tetrahedral mesh. While it was mainly developed for simulating detailed models of neuronal signaling pathways in dendrites and around synapses, it is a general tool and can be used for studying any biochemical pathway in which spatial gradients and morphology are thought to play a role. We have implemented STEPS as a set of Python modules, which means STEPS users can use Python scripts to control all aspects of setting up the model, generating a mesh, controlling the simulation and generating and analyzing output. The core computational routines are still implemented as C/C++ extension modules for maximal speed of execution.

Abbreviations: STEPS

Synonyms: STochastic Engine For Pathway Simulation

Resource Type: software application, simulation software, software resource

Keywords: reaction-diffusion, stochastic, signaling, molecular, python, software, simulator, reaction kinetics, 3d diffusion, signaling pathway, scripting, bio.tools

Funding: GOA ;
UA Belgium ;
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Okinawa Institute of Science and Technology

Resource Name: STEPS

Resource ID: SCR_008742

Alternate IDs: biotools:steps, nlx_143852

Alternate URLs: <https://bio.tools/steps>

Old URLs: <http://steps.sourceforge.net/STEPS/Home.html>

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Record Last Update: 20260728T043309+0000

Ratings and Alerts

No rating or validation information has been found for STEPS.

No alerts have been found for STEPS.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 336 mentions in open access literature.

Listed below are recent publications. The full list is available at [SPARC SAWG](#) .

Fernández-Niño JA, et al. (2025) A multi-country comparison between mobile phone surveys and face-to-face household surveys to estimate the prevalence of non-communicable diseases behavioural risk factors in low- and middle-income settings. *BMJ global health*, 10(6).

D K, et al. (2025) A national survey-based method for monitoring noncommunicable disease risk factors among adolescents aged 15-17 years across India. *MethodsX*, 15, 103535.

Gooding DC, et al. (2025) Guided by the community: Insights on recruitment science from the African Americans Fighting Alzheimer's in Midlife (AA-FAIM) Project. *Alzheimer's & dementia. Behavior & socioeconomics of aging*, 1(2).

Craig AT, et al. (2025) Integrating post-validation surveillance of lymphatic filariasis with the WHO STEPwise approach to non-communicable disease risk factor surveillance in Niue, a study protocol. *PloS one*, 20(1), e0315625.

Mousavi A, et al. (2025) Quality-adjusted life expectancy norms for the Iranian population. *Population health metrics*, 23(1), 5.

Pourabhari Langroudi A, et al. (2025) Age of tobacco smoking initiation among Iranian adults based on National and Subnational data from the 2021 STEPS survey : Short title: Tobacco Smoking Onset Age in Iran. *Scientific reports*, 15(1), 8504.

Zhang Y, et al. (2025) Associations between education and ideal cardiovascular health metrics across 36 low- and middle-income countries. *BMC medicine*, 23(1), 204.

Kansiime G, et al. (2025) Prevalence, Awareness, and Factors Associated with Hypertension Among Adults in Rural Southwestern Uganda: A Baseline Survey. *International journal of general medicine*, 18, 3289.

Byambadorj N, et al. (2025) Protocol for evaluating the cost-effectiveness of Mongolia's sugar-sweetened beverages tax using double machine learning. *PloS one*, 20(6), e0324378.

Addis Z, et al. (2025) Comorbid cardiovascular diseases and predictors among adults with type 2 diabetes in Bahir Dar city, Ethiopia: a multicentre hospital-based cross-sectional study. *BMJ open*, 15(5), e086054.

Rezaee M, et al. (2025) Burden of High Systolic Blood Pressure in the Eastern Mediterranean Region, 1990 to 2021: Results From the Global Burden of Disease Study 2021. *Journal of the American Heart Association*, 14(11), e039158.

Amberbir A, et al. (2025) Understanding needs and solutions to promote healthy ageing and reduce multimorbidity in Rwanda: a protocol paper for a mixed methods, stepwise research study. *BMJ open*, 15(3), e089344.

Bejnö H, et al. (2025) Improved readability in written neurodevelopmental reports by five writing rules. *Scandinavian journal of psychology*, 66(1), 28.

Stegman P, et al. (2025) Estimating the cost of and willingness to pay for providing the dapivirine ring for HIV prevention in Kenya. *BMC public health*, 25(1), 1095.

Block VJ, et al. (2025) No evidence of fluctuations in daily step count between infusions in people with multiple sclerosis treated with anti-CD20 monoclonal antibodies. *Multiple sclerosis journal - experimental, translational and clinical*, 11(1), 20552173251329817.

Mohseni P, et al. (2025) The interplay of physical activity and smoking with metabolic syndrome and its components in the STEPS survey. *Scientific reports*, 15(1), 12590.

Belete GK, et al. (2025) Prevalence and associated factors of diabetes among adult populations of Hawassa town, southern Ethiopia: A community based cross-sectional study. *PloS one*, 20(1), e0318081.

Masengere P, et al. (2025) Additive interaction of conjoint tobacco smoking and heavy drinking on hypertension prevalence in rural Uganda: a community-based cross-sectional study. *BMC public health*, 25(1), 201.

Chimoriya R, et al. (2025) The Association of Physical Activity With Overweight/Obesity and Type 2 Diabetes in Nepalese Adults: Evidence From a Nationwide Non-Communicable Disease Risk Factor Survey. *Obesity science & practice*, 11(1), e70046.

Ataei SM, et al. (2025) Over-time changes in the prevalence of metabolic syndrome and its components among elderly population in Iran from 2016 to 2021; A nation-wide study. *PloS one*, 20(9), e0331601.