

**Third Open-Innovation
Bio4Comp Award
1. Prize: 5000 Euro**



We hereby announce the third open-innovation Bio4Comp Award for novel ideas that conceptually or technically advance the field of computing with biological agents in a substantial manner.

Background:

Encoding combinatorial problems into physical networks, which can be explored in parallel by a huge amount of agents (network-based computation, NBC) is a promising approach for solving NP-complete problems. The use of biological agents like microorganisms or cytoskeletal filaments propelled by molecular motor proteins for exploring these networks has been demonstrated as an energy efficient and scalable solution. [1, 2] The basic elements of a network are junctions for dividing, mixing or crossing pathways (switchable or non-switchable), multiplication and tagging of agents as well as reading the tags and detecting the agents at the outputs of the network. Beside the realization of high-performance biocomputers, the integration of biotechnology and combinatorial logic could upgrade customized lab-on-a-chip devices for point-of-care diagnostics or open up new application fields for biological data storage or combinatorial biotechnology. This cross-disciplinary approach between biology, nanotechnology and computer science could enable groundbreaking innovations in the bio economy.

[1] Nicolau *et al.*, *PNAS*, 113(10), pp. 2591-2596, 2016).

[2] van Delft *et al.*, *Interface Focus* 8: 20180034, 2018).

Challenge: Applications for network-based and bio-inspired computation technologies

The competition asks for

- a) Applications for network-based computers using bio-molecular agents;**
- or b) Applications in the field of diagnostics or lab on a chip devices utilized by molecular motor propelled filaments;**
- or c) Applications or application scenarios which are enabled by network-based biocomputation and contribute to biotechnological challenges;**

Who can participate: All professionals, scientists or students interested in the field of biocomputation. Persons employed by partner Institutions of Bio4Comp (Lund University, Technische Universität Dresden, Linnaeus University, Molecular Sense Ltd, Bar Ilan University, Fraunhofer Gesellschaft) are excluded from the awards. Each person can only get an award once. All participants agree that the winning contribution will be published on the project website or an open repository for maximum impact (open innovation), after the announcement of the winner. Contributions that do not win can at that point choose to opt out of publication. Publication before participating in the contest is possible.

How to participate and award criteria: Participants will submit a description of their idea (max. 3 pages) to the Innovation System Committee (info@bio4comp.org). Applications will be evaluated according to: (i) novelty and excellence of the idea, (ii) potential impact for the research area, and (iii) feasibility. The decision about the winner(s) of the contest will be made by the Innovation System Committee in agreement with the Bio4Comp General Assembly. After announcement, the decision will be final and cannot be contested. The winner will receive a 5000 Euro prize¹ (by bank transfer from Lund University).

Deadline: 17 July 2021

¹ Taxes depend on the winner's tax residence and will be deducted from the prize according to Swedish law.