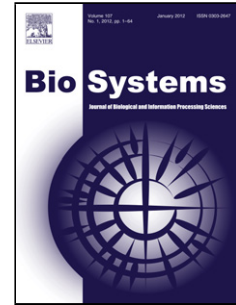


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Slime mould: the fundamental mechanisms of biological cognition

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Abstract

The slime mould *Physarum polycephalum* has been used in developing unconventional computing devices for in which the slime mould played a role of a sensing, actuating, and computing device. These devices treated the slime mould rather as an active living substrate yet the slime mould is a self-consistent living creature which evolved for millions of years and occupied most part of the world, but in any case, that living entity did not own true cognition, just automated biochemical mechanisms. To “rehabilitate” the slime mould from the rank of a purely living electronics element to a “creature of thoughts” we are analyzing the cognitive potential of *P. polycephalum*. We base our theory of minimal cognition of the slime mould on a bottom-up approach, from the biological and biophysical nature of the slime mould and its regulatory systems using frameworks such as Lyons biogenic cognition, Muller, di Primio-Lengeler’s modifiable pathways, Bateson’s “patterns that connect” framework, Maturanas autopoietic network, or proto-consciousness and Morgans Canon.

Keywords: consciousness, cognition, slime mould

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