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Poster title:

Atypical wave pattern during aggregation of *Dictyostelium discoideum* cells

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Abstract:

Dictyostelium discoideum is an extraordinary microorganism which is ideal for studying many biological processes, e.g. the formation of a multicellular structure and the differentiation of cells. Patterns produced during a process of aggregation are interesting from the nonlinear dynamics viewpoint. It is known that starving *Dictyostelium* cells cluster together as a result of spreading of concentration waves of cyclic adenosine-3',5'-monophosphate (cAMP). These waves are similar to the patterns observed in the Belousov-Zhabotinsky reaction. The mechanism of the cAMP waves has already been explained in the literature. Normally, cAMP is periodically produced and degraded by the *Dictyostelium* cells; cAMP concentration then periodically changes in space and time. In our experiments, cAMP is added to the supporting agar thereby the cells are exposed to the long term effect of cAMP. These abnormal conditions induce formation and propagation of a global wave, an atypical wave pattern observed before the aggregation sets in. The global wave is initiated spontaneously in an arbitrary location. The time of the global wave appearance increases with the increasing level of cAMP and its propagation velocity decreases with increasing concentration of cAMP in agar. The appearance of the global wave is a new phenomenon open for further research.