

Abstract Submitted  
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**Cellular cAMP uptake as trigger for electrotaxis**<sup>1</sup> ISABELLA GUIDO, EBERHARD BODENSCHATZ, Max-Planck Institute for dynamics and self-organization — Cells have the ability to detect continuous current electric fields and respond to them with a directed migratory movement. Dictyostelium discoideum cells, a key model organism for the study of eukaryotic chemotaxis, orient and migrate toward the cathode under the influence of an electric field. The underlying sensing mechanism and whether it is shared by the chemotactic response pathway remains unknown. By investigating the migration in the electric field of cell strains unable to migrate chemotactically (Amib-null) and with defective cAMP relay (ACA-null) we show that the starvation-induced transcription of a set of genes involved in the early developmental stage is not necessary for electrotaxis. However, the analysis of electrotaxis of vegetative cells as well as shortly starved cells shows that cells need to be stimulated with cAMP in order for them to migrate electro-tactically. Indeed 30 minutes stimulation with cAMP pulses is enough to let cells orienting with the electric field although during this time the expression of receptors and the beginning of the development has not happened yet. We believe that the reason for this observed phenomenon lies on the endocytosis of the external cAMP which triggers electrotaxis as long as endocytosis and exocytosis are not balanced.

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