

Abstract Submitted  
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**Influence of electric field on cellular migration**<sup>1</sup> ISABELLA GUIDO, EBERHARD BODENSCHATZ, Max Planck Institute for Dynamics and Self-Organization, Goettingen, Germany — Cells have the ability to detect continuous current electric fields (EFs) and respond to them with a directed migratory movement. *Dictyostelium discoideum* (D.d.) cells, a key model organism for the study of eukaryotic chemotaxis, orient and migrate toward the cathode under the influence of an EF. The underlying sensing mechanism and whether it is shared by the chemotactic response pathway remains unknown. Whereas genes and proteins that mediate the electric sensing as well as that define the migration direction have been previously investigated in D.d. cells, a deeper knowledge about the cellular kinematic effects caused by the EF is still lacking. Here we show that besides triggering a directional bias the electric field influences the cellular kinematics by accelerating the movement of cells along their path. We found that the migratory velocity of the cells in an EF increases linearly with the exposure time. Through the analysis of the PI3K and Phg2 distribution in the cytosol and of the cellular adherence to the substrate we aim at elucidating whereas this speed up effect in the electric field is due to either a molecular signalling or the interaction with the substrate.

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Isabella Guido  
Max Planck Institute for Dynamics and Self-Organization, Goettingen

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