ROLE OF MYOSIN II IN DICTYOSTELIUM PHAGOCYTOSIS

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Phagocytosis is a process used by phagocytic cells, including the protist *Dictyostelium discoideum*, to internalize particles larger than 0.5 µm in diameter. The internalized particles are subsequently digested in the course of endocytic transport, and finally expelled out of the cell by exocytosis. Normal duration of the period between particle internalization and exocytosis exceeds 60 minutes in wild-type *Dictyostelium* cells. Both phagocytosis and exocytosis depend on activity of the actin cytoskeleton, including motor proteins belonging to myosin superfamily. No universal role in phagocytosis and the endocytic transport, however, has been assigned to the most well-known member of this superfamily, the two-headed motor protein myosin II. In accord with this state of knowledge, no deficiencies in phagocytosis were detected up to now in *Dictyostelium* cells that do not produce functional myosin II.

In the present work, confocal laser scanning microscopy was used to follow localization of the fusion proteins GFP-myosin II and YFP-ABD (actin-binding domain) during phagocytosis in living *Dictyostelium* cells. Using these constructs, the dynamics of myosin II and F-actin was visualized. It was discovered that cells lacking a functional myosin II typically expel content of their phagosomes within the first five minutes after internalization, a phenomenon that was termed premature exocytosis. Differences in the duration of several phases of phagocytosis, dependent on the presence or absence of myosin II, were determined, indicating a role of myosin II in the regulation of dynamics of phagocytosis. It was concluded that myosin II does not play a key role in the early phase of phagocytosis, but its absence influences in a major way efficiency of the endocytic transport and determines its final outcome.