

A POSSIBLE ROLE FOR BRAIN CREATINE KINASE IN PHAGOCYTOSIS.

J. Kuiper*, F. de Lange#, B. Wieringa*, J.A.M. Fransen*#.

***Department of Cell Biology and #Microscopic Imaging Centre, NCMLS,
Radboud University Nijmegen Medical Centre, P.O. Box 9101, 6500 HB
Nijmegen, The Netherlands. Phone: +31.24.3614284, E-mail:
j.fransen@ncmls.ru.nl**

Important cellular functions like control of cell shape, migration and phagocytosis depend on rapid reorganization of the actin cytoskeleton, which is driven by ATP-dependent actin polymerization and myosin action. The creatine kinase (CK) system preserves optimal local ATP/ADP ratios and delivers ATP to sites of energy consumption. Therefore, CK could be important in rapid actin-remodeling processes like phagocytosis.

Macrophage derived cell lines (Raw 264.7) were transiently transfected with CK-B and fixed during phagocytosis of zymosan particles. Indirect immunofluorescence revealed accumulation of both actin and CK-B in the phagocytotic cup. Using GFP-tagged CK-B in living cells we observed that accumulation in the phagocytotic cup is only temporal during several minutes in the initial phase of phagocytosis of the particle. This temporal accumulation is also observed for GFP-tagged actin in living cells.

However, since some observations point to subtle spatio-temporal differences of the accumulation of actin and CK-B, we established cell lines co-expressing CFP and YFP versions of these proteins (including catalytic inactive versions of CK-B) to get more insight into the recruitment dynamics of CK-B in actin-remodeling. The analysis of these cell lines is in progress.