



Project: Cell quiescence: Role of cell compartmentalization of the extracellular-signal-regulated kinases (ERK)

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Summary:

Cell quiescence is a widespread state, typical for majority of somatic and adult stem cells in the multicellular organisms. Its determination as a separate period (Go), different from the phases of the cell cycle, raise the fundamental question of clarifying the mechanisms that cause its establishment and maintenance. This project will examine the hypothesis that entry into the Go is related to the localization of the activated extracellular-signal regulated kinase (ERK) in the membrane raft domains. To determine the validity of this hypothesis and its scope we will use three model systems, including monolayer and three-dimensional cell cultures and in vivo models of regenerating liver and lymphocyte activation. They will be studied by a multidisciplinary approach combining methods from cell biology, biochemistry and biophysics. The confirmation of our hypothesis will provide new knowledge about basic mechanisms, governing the transition between quiescence and proliferation. The results from this study will facilitate the development of future strategies for control of diseases based on hypo- or hyper-proliferation as well as aging and reparative therapies, based on stem cells.

Key words: Cell quiescence (Go), Cell cycle, extracellular-signal regulated kinases (ERK), Lipid rafts
