The KDEL receptor –
New interaction partners and functions on the cell surface

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The retention of important ER resident proteins is a crucial factor for maintaining the ER proteome and fundamental cellular functions. KDELRs (KDEL receptor 1-3) are able to bind proteins with a C-terminal KDEL-like amino acid sequence in the Golgi and retrotransport them back into the ER [1]. This transport function is accompanied by the ability to modulate a broad range of cellular functions via activation of G-proteins and kinase associated signal cascades [2]. Previous studies also suggest new roles of KDELRs at the plasma membrane and demonstrate that KDEL cargo binding promotes KDELR clustering at the cell surface of HeLa cells [3]. By performing live cell imaging experiments on various species and different cell types, a similar KDELR cluster dynamic could be observed in most of the human and mouse cell lines. Interestingly, human and murine macrophage cell lines did not show any cluster formation. However, KDELR expression based on RT-qPCR studies did not show a correlation with the clustering behavior in the diverse cell types or with the absence of clusters in macrophages, suggesting differences in KDELR localization or internalization. Subsequently, the PM localizations on various cell types will be investigated by cell surface biotinylation in the future, which should bring new insights into the role of KDELRs in mammalian cells.

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[2] Giannotta M et al. The KDEL receptor couples to Gαq/11 to activate Src kinases and regulate transport through the Golgi. EMBO J. 31(13):2869–2881. doi:10.1038/emboj.2012.134 (2012)

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