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Basigin Binds to Calpain 4 for the Production of Traction Forces

Abstract: Traction force and mechanosensing (the ability to sense mechanical attributes of the environment) are used by a cell to modify migratory behavior. In previous studies we found that the calpain small subunit, calpain 4, regulates the production of traction force independent of its proteolytic holoenzyme. An active protease is formed when calpain4 and calcium bind to either of its catalytic partners, calpain 1 and 2. To further understand how traction force is regulated, we used two-hybrid analysis to identify more components of the traction pathway. We were surprised to discover that basigin, an integral membrane protein and an inducer of matrix-metalloprotease binds to calpain 4 in two-hybrid and pull-down assays. When basigin was silenced in MEF cells, traction force and adhesion strength was found to be defective. Consistent with *Capn4*^{-/-} MEF cells, the cells deficient in basigin responded to localized stimuli. Together these results implicate basigin in the pathway in which calpain 4 regulates traction force independent of the catalytic large subunits to control cell migration.

Keywords: Basigin, calpain, traction force, adhesion, mechanosensing, migration

Biography: Karen Beningo has completed her Ph.D. at the University of Michigan, Ann Arbor, USA and a NRSA Fellowship at the University of Massachusetts Medical School, Worcester, USA. She has presented papers in more than 20 national and international conferences including EMBO, AACR and ASCB. She has over 30 publications in national and international journals that have accumulated nearly 5000 citations. She is currently an Associate Professor of Biological Sciences at Wayne State University, USA and a member of the Karmanos Cancer Institute.