

Profilin 1 reduces CTL migration and survival under high tension

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In a solid tumor, inter-tension is very high. It was reported that high tension affected cell morphology and gene expression of cancer cells. However, it is unknown whether high tension plays any role on cytotoxic T lymphocytes (CTL) and the potential mechanism. Here, we used different concentrations of collagen to mimic various tensions. High tension reduced the searching efficiency and survival of CTL. This might explain the difficulty of immune cell killing target cells in solid tumor tissues. Our previous work has revealed that in patients with pancreatic cancer, profilin 1 (PFN1), essential for F-actin elongation, was decreased in peripheral CD8⁺ T cells (Schoppmeyer and Zhao et al. unpublished). Therefore, we further investigated the role of PFN1 on CTL under different tension in vitro. We found that F-actin was accumulated at the site of nuclear deformation, and the accumulation was increased under higher extracellular tension. Down-regulation of PFN1 further reduced the migration velocity and persistence, as well as the survival of CTL compared with control CTL under high tension.