Profilin's function as a tumor suppressor

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Background

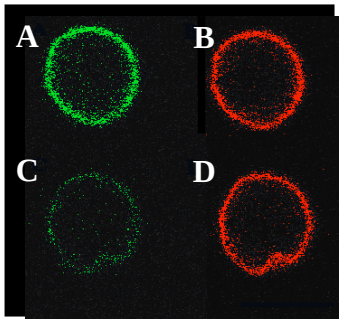
Profilin is a small essential protein that has been implicated in breast cancer. It was recently shown that profilin reduces the tumorigenicity of breast cancer cells. Depending on its expression level, profilin reduces the mobility of cancer cells and hence has the potential to inhibit metastasis. However, the mechanism involved in the reduction of tumorigenicity and motility by profilin is still far from understood.

Outcomes:

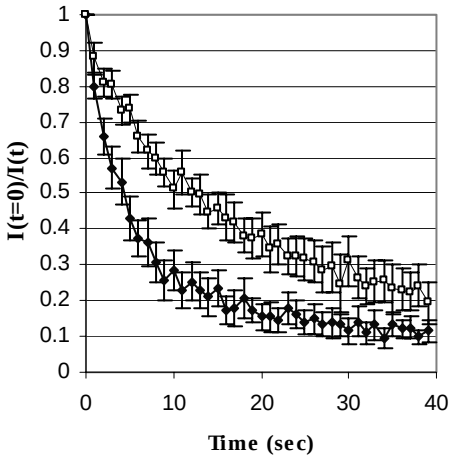
- A better understanding of the role of profilin in cancer and diseases.
- New target(s) for cancer drugs

Progress to date

- We are studying the interactions of profilin with single polyphosphoinositides lipids (lipids which are involved in cell signaling).
- We found that the interaction with single polyphosphoinositides lipids is significantly weaker than the interaction of profilin with the polyphosphoinositides lipids packed into micelles.
- Using Giant unilamellar vesicles or GUV (which have similar size and membrane curvatures than cells) we found that, despite the weak interactions with single polyphosphoinositides lipids, profilin do bind to the membrane.



GUV containing 0.25% BODIPY®-FL and 0.25% BODIPY®-TMR excited at 488 nm. **A**, **C** are the fluorescence intensities at 515 nm. **B, D** are the intensities at 600 nm. **A, B** are the images before photobleaching. **C**, **D** after photobleaching.



Relative changes in fluorescence intensity (I) for BODIPY®-FL in presence of BODIPY®-TMR as a function of time in GUV. The □ are the data in absence of profilin (n=12). The ♦ are the data in presence of 100μM profilin (n=11). The error bars are the SEM.

Funding/partnership are sought to

- continue to investigate the binding of profilin to polyphosphoinositides lipids, in cuvette, GUV and cells.
- study the effect of profilin modification (e.g. phosphorylation) on the binding to its ligands.

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