Membrane tension and domains: New method of measurement and visualization

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Organelles and cells are delimited by a lipid bilayer, which is highly deformable, a property essential to many cell processes such as motility, endocytosis, cell division. During these deformations, lipid membranes experience stretch causing membrane tension. Membrane tension is therefore a main regulator of the cell processes that remodel membranes, albeit, it is difficult to measure *in vivo*. **FliptR** (for Fluorescent LIPid Tension Reporter) can monitor changes of membrane tension by changing its fluorescence lifetime as a function of the twist between its fluorescent groups. We show that **fluorescence lifetime** depends linearly on **membrane tension**[1-3], allowing for an easy quantification of membrane tension by fluorescence lifetime imaging microscopy (**FLIM**) and **Fast-FLIM.**

Given that **FliptR** tremendously facilitates membrane tension measurements, we are currently studying membrane tension on the organelles[4], plasma membrane and tissues during different cell processes.

References

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Figures

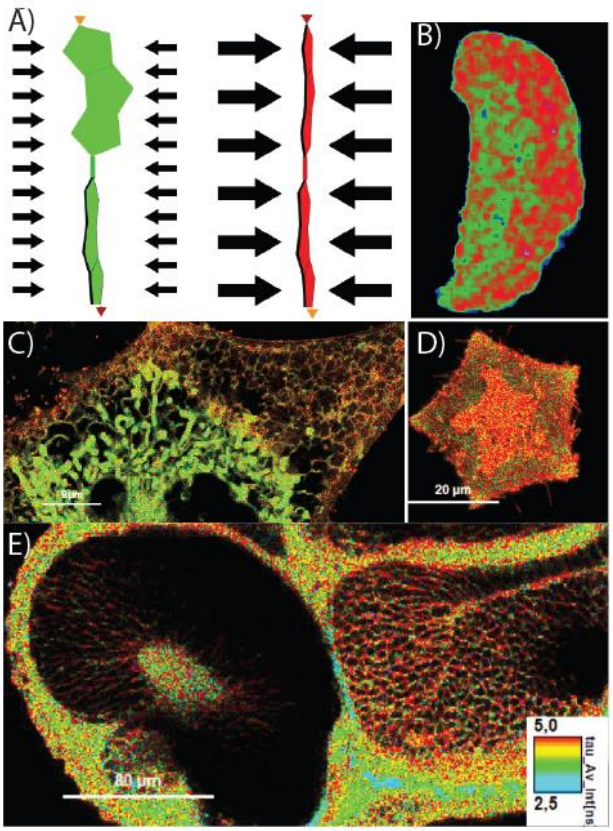

Figure 1. A) Twisted and planar conformation structure of FliptR based in the lateral pressure. B) Cell membrane domain related with tension during cell migration. C) FLIM images of mitochondria and ER organelles, D) cell adhesion surface on pattern and E) zebrafish embryo.

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