

Curriculum Vitae



Name
Feng-Ching TSAI

Current Position
Permanent Researcher, CNRS, Institute Curie

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Education & Professional Experiences

- | | |
|-------------------|---|
| 10/2024 | Habilitation Diploma in Physics (Sorbonne University)
Actin assembly and re-organization on membranes mediated by actin-membrane linkers |
| 06/2014 – 09/2019 | Postdoc in the groups of Dr. P. Bassereau and Dr. B. Goud, Institut Curie, Paris, France.
Topic: <i>Protein recruitment on curved membranes</i> |
| 08/2009 - 03/2014 | PhD thesis <i>Cytoskeletal organization in biomimetic liposomes</i>
Supervisor: Prof. G. Koenderink, AMOLF, the Netherlands |
| 09/2007 – 06/2009 | Research Assistant . Topic: <i>Actin-driven membrane waves in living cells</i>
Supervisor: Prof. Chau-Hwang Lee, Academia Sinica, Taiwan |
| 09/2005 – 07/2007 | Master thesis <i>Physics of adsorption induced endocytosis</i>
Supervisor: Prof. Hsuan-Yi Chen, National Central University, Taiwan |
| 09/2001 – 07/2005 | Bachelor , Department of Physics, National Changhua University of Education, Taiwan |

Research Interests

Biophysics of actin cytoskeleton, membrane remodeling, biomimetic systems, molecular motors

Selected Publications

1. Guerin, G.; Nguyen, T. L. A.; Manzi, J.; Clainche, C. L.; Heuvingh, J.; Rodriguez, N.; Cribier, S.; Berro, J.; **Tsai, F.-C#**. Asymmetric Phosphoinositide Lipid Bilayers Generated by Spontaneous Lipid Insertion. *Langmuir*, 2026, p 2025.03.26.645509. DOI:10.1021/acs.langmuir.5c05409. # corresponding author
2. J. R. Beiter, C.-J. Sung, S.-S. Lin, N. de Vuono, S. Arumugam, J. Manzi, A. Bertin, P. Bassereau, Y.-W. Liu#, G. A. Voth#, **F.-C. Tsai#**, A Non-Canonical Interface of SNX9 PX Domain Selectively Sequesters PI(3,4)P2 Lipids, Protecting Them from Hydrolysis. 2025.03.26.645564 *bioRxiv*, <https://doi.org/10.1101/2025.03.26.645564>, 2025. # corresponding authors.

3. B. Rambaud, M. Joseph, **F.-C. Tsai**, C. De Jamblinne, E. Del Guidice, R. Sabelli, P. Bassereau, D. R Hipfner, S. Carréno, “STRIPAK controls cell-cell communication by promoting cytoneme biogenesis through the membrane-sculpting function of Slik”, **EMBO Journal**, [doi 10.1038/s44318-025-00401-8](https://doi.org/10.1038/s44318-025-00401-8) ,2025
4. **F.-C. Tsai***, J. M. Henderson*, Z. Jarin, E. Kremneva, Y. Senju, J. Pernier, O. Mikhajlov, J. Manzi, K. Kogan, C. Le Clairche, G. A. Voth#, P. Lappalainen#, P. Bassereau#, “Activated I-BAR IRSp53 clustering controls the formation of VASP-actin-based membrane protrusions”, **Science Advances**, [abp8677](https://doi.org/10.1126/sciadv.abp8677), 2022, (*co-first author, #corresponding).

Lecture Title

Asymmetric actin assembly driven by N-WASP at saddle-shaped membrane necks

Abstract (500 words maximum)

Actin assembly plays a critical role in various membrane remodeling processes, including endocytosis, where vesicle formation involves the emergence of a bud connected to the plasma membrane through a saddle-shaped neck. Although actin has been reported to localize around endocytic neck regions and contribute to membrane deformation, the mechanisms governing its spatial organization and force generation remain poorly understood. To address this fundamental question, we developed a reconstituted system that recapitulates membrane neck geometry by wrapping lipid bilayers around micron-sized beads on glass substrates. The formation of saddle-shaped membrane necks was validated by the selective enrichment of the curvature-sensing BAR protein SNX9. Strikingly, we observed that the actin nucleation-promoting factor N-WASP accumulates at membrane necks by itself. This neck-localized N-WASP triggers a local assembly of Arp2/3 complex-mediated branched actin networks that is asymmetrically around the neck. Such asymmetric actin assembly generates directional forces, resulting in both lateral and vertical displacements of the beads. Our findings reveal a minimal physical mechanism by which curvature-sensing N-WASP spatially organizes actin force production at saddle-shaped membrane necks.