CELL BIOLOGY PROGRAM

The Meng-Fu Bryan Tsou Lab

Meng-Fu Bryan Tsou, PhD

The goal of my research is to understand the biogenesis of centrioles/centrosomes and primary cilia, and how defects in these processes affect mammalian cell physiology and evoke stress responses. Using quantitative proteomics, super-resolution microscopy, comparative genomics, proximity labeling, and whole genome CRISPR screen, we have identified lists of new components associated with vertebrate centrosomes and ciliogenesis. Functions of these molecules are being examined in the most appropriate experimental system, including human culture cells for cell-based assays, and most recently, mice, as the genetic system to explore the regulation specific to vertebrate ciliogenesis. This multi-system approach has revealed complex regulatory networks underlying centriole homeostasis and ciliogenesis that have been either preserved throughout the evolution or modified specifically for vertebrates and mammals.

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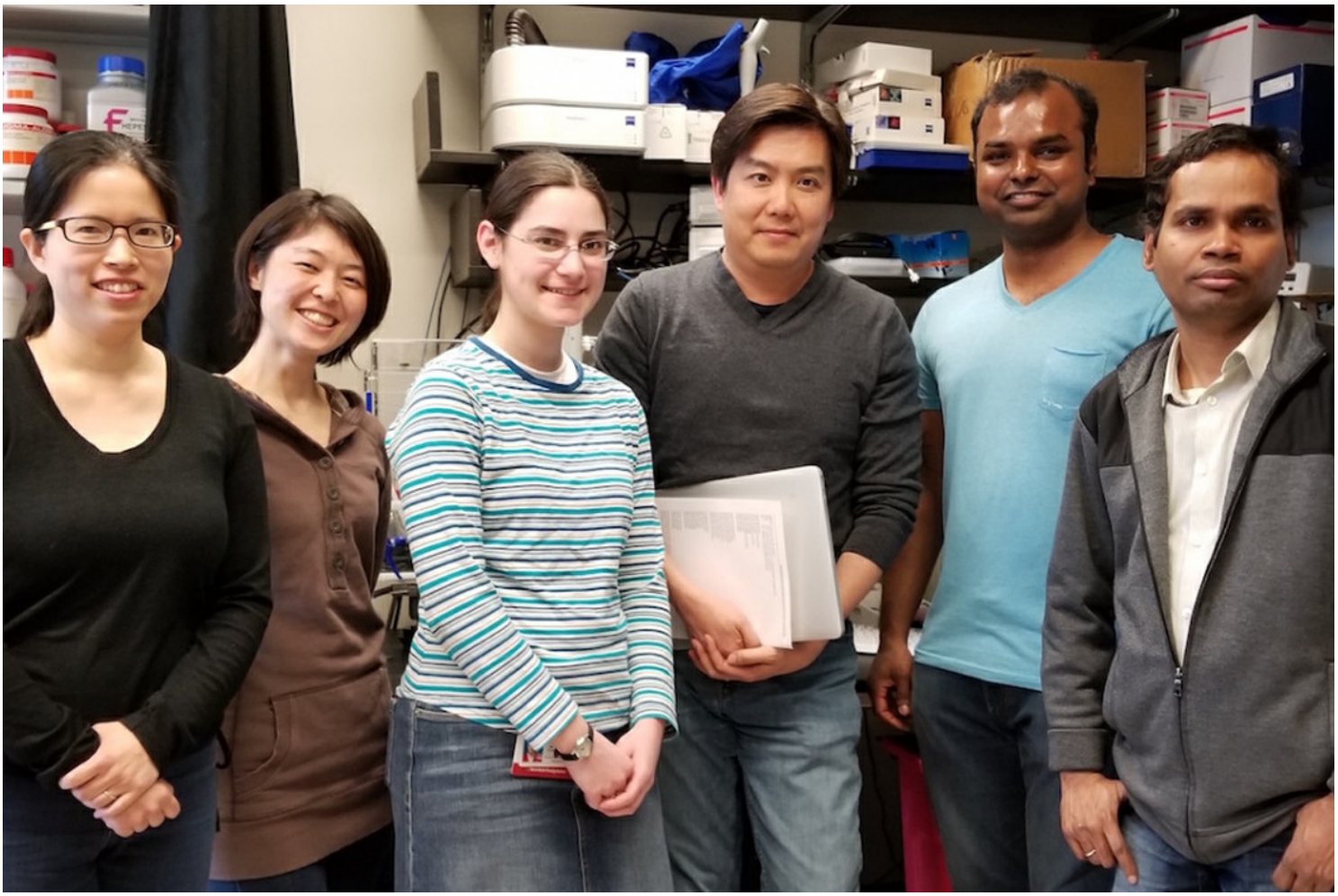

Publications Highlights

Centrosome anchoring regulates progenitor properties and cortical formation.
Shao W, Yang J, He M, Yu XY, Lee CH, Yang Z, Joyner AL, Anderson KV, Zhang J, Tsou MB, Shi SH. Nature. 2020 Apr;580(7801):106-112. doi: 10.1038/s41586-020-2139-6. Epub 2020 Mar 25. PMID: 32238932; PMCID: PMC7138347.

Super-resolution microscopy reveals coupling between mammalian centriole subdistal appendages and distal appendages.
Chong WM, Wang WJ, Lo CH, Chiu TY, Chang TJ, Liu YP, Tanos B, Mazo G, Tsou MB, Jane WN, Yang TT, Liao JC. Elife. 2020 Apr 3;9:e53580. doi: 10.7554/eLife.53580. PMID: 32242819; PMCID: PMC7173962.

PPP1R35 ensures centriole homeostasis by promoting centriole-to-centrosome conversion.
Fong CS, Ozaki K, Tsou MB. Mol Biol Cell. 2018 Nov 15;29(23):2801-2808. doi: 10.1091/mbc.E18-08-0525. Epub 2018 Sep 19. PMID: 30230954; PMCID: PMC6249868.

Super-resolution architecture of mammalian centriole distal appendages reveals distinct blade and matrix functional

components.

Yang TT, Chong WM, Wang WJ, Mazo G, Tanos B, Chen Z, Tran TMN, Chen YD, Weng RR, Huang CE, Jane WN, Tsou MB, Liao JC. Nat Commun. 2018 May 22;9(1):2023. doi: 10.1038/s41467-018-04469-1. PMID: 29789620; PMCID: PMC5964178. (*Co-corresponding authors).

Probing Cilia-Associated Signaling Proteomes in Animal Evolution.

Shulman AS, Tsou MF. Dev Cell. 2017 Dec 18;43(6):653-655. doi: 10.1016/j.devcel.2017.12.009. PMID: 29257946.

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People

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Cell biologist Meng-Fu Bryan Tsou studies cell cycle control of centrosome duplication and degeneration, as well as cilia assembly and disassembly.

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No disclosures meeting criteria for time period

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