BII – Biophysical Modelling Publications

***(Publications sorted: Newest to Oldest)*

1.	**Ai Kia Yip, Songjing Zhang, Lor Huai Chong, Elsie Cheruba, Jessie Yong Xing Woon, Theng Xuan Chua, Corinna Jie Hui Goh, Haibo Yang, Chor Yong Tay, Cheng-Gee Koh, K.-H. Chiam**, Zyxin Is Involved in Fibroblast Rigidity Sensing and Durotaxis, Frontiers in Cell and Developmental Biology 9, 3264 (2021)
2.	**Nicole Zi-Jia Khong, Yukai Zeng, Soak-Kuan Lai, Cheng-Gee Koh, Zhao-Xun Liang, K.-H. Chiam*, Hoi-Yeung Li***, Dynamic swimming patterns of Pseudomonas aeruginosa near a vertical wall during initial attachment stages of biofilm formation, Scientific Reports 11, 1952 (2021)
3.	**Ai Kia Yip, Akhila Balachander, Leonard D.L. Tan, Ka Hang Liong, Rui Zhen Tan, Karl Balabanian, Francoise Bachelerie, Lai Guan Ng*, K.-H. Chiam***, A chemotaxis model to explain WHIM neutrophil accumulation in the bone marrow of WHIM mouse model, Blood Science 1, 102 (2019)
4.	**Lingyi Xin, Yukai Zeng, Shuo Sheng, Rachel Andrea Chea, Qiong Liu, Hoi Yeung Li, Liang Yang, Linghui Xu, K.-H. Chiam, Zhao-Xun Liang**, Regulation of flagellar motor switching by c-di-GMP phosphodiesterases in Pseudomonas aeruginosa, Journal of Biological Chemistry 294, 13789 (2019)
5.	**Thankiah Sudhaharan, Srivats Hariharan, John Soon Yew Lim, Jaron Zhongliang Liu, Yen Ling Koon, Graham D. Wright, K.-H. Chiam, Sohail Ahmed**, Superresolution microscopy reveals distinct localisation of full length IRSp53 and its I-BAR domain protein within filopodia, Scientific Reports 9, 2524 (2019)
6.	**Atkuru S, Muniraj G, Sudhaharan T, Chiam KH, Wright GD, Sriram G.** Cellular ageing of oral fibroblasts differentially modulates extracellular matrix organization. Journal of Periodontal Research, doi: 10.1111/jre.12799
7.	**Khong NZ, Zeng Y, Lai SK, Koh CG, Liang ZX, Chiam KH, Li HY.** Dynamic swimming pattern of Pseudomonas aeruginosa near a vertical wall during initial attachment stages of biofilm formation. Scientific Reports, 2021 Jan 21;11(1):1952, PMID: 33479476, doi: 10.1038/s41598-021-81621-w
8.	**Kim PR, Koon YL, Lee TCR, Azizan F, Koh HZD, Chiam KH, Koh CG**. Phosphatase POPX2 interferes with cell cycle by interacting with Chk1. Cell Cycle, Vol. 19, 2020, Issue 4, doi: 10.1080/15384101.2020.1711577
9.	**Sudhaharan T, Hariharan S, Lim JSY, Liu JZ, Koon YL, Wright GD, Chiam KH, Ahmed S.** (2019). Superresolution microscopy reveals distinct localisation of full length IRSp53 and its I-BAR domain protein within filopodia. Scientific Reports 9, No. 2524, 2019, doi: 10.1038/s41598-019-38851-w
10.	**Xin L, Zeng Y, Sheng S, Chea RA, Liu Q, Li HY, Yang L, Xu L, Chiam KH, Liang ZX.** (2019). Regulation of flagellar motor switching by c-di-GMP phosphodiesterases in Pseudomonas aeruginosa. Journal of Biological Chemistry, 2019, Sep 13, 294 (37), Pg 13789-13799, doi: 10.1074/jbc.RA119.009009
11.	**Chew S, Zeng Y, Khoo D, Hong Yu MY, Ahmed S, Chiam KH.** (2018). Enrichment and

	Identification of Neural Stem Cells in Neurospheres Using Rigidity-Tunable Gels. Tissue Engineering Part A, Vol.25, No. 5-6, 2019, doi: 10.1089/ten.tea.2018.0221
12.	**Yip AK, Nguyen AT, Rizwan M, Wong ST, Chiam KH, Yim EKF.** (2018). Anisotropic traction stresses and focal adhesion polarization mediates topography-induced cell elongation. Biomaterials 181, 103 (2018)
13.	**Koon YL, Zhang S, Rahmat MB, Koh CG, Chiam KH.** (2018). Enhanced Delta-Notch Lateral Inhibition Model Incorporating Intracellular Notch Heterogeneity and Tension-Dependent Rate of Delta-Notch Binding that Reproduces Sprouting Angiogenesis Patterns. Scientific Reports 8, 9519 (2018)
14.	**Quek R, Lim KM, Chiam KH.** (2018). Three-dimensional computational model of multiphase flow driven by a bed of active cilia. Computers and Fluids 170, 222 (2018)
15.	**Zeng Y, Wong ST, Teo SK, Leong KW, Chiam KH, Yim EKF.** (2018). Human mesenchymal stem cell basal membrane bending on gratings is dependent on both grating width and curvature. Scientific Reports 8, 6444 (2018)
16.	**Yip AK, Huang P, Chiam KH.** (2018). Cell-cell adhesion and cortical actin bending govern cell elongation on negatively-curved substrates. Biophysical Journal 114, 1707 (2018)
17.	**Tan RZ, Chiam KH.** (2018). A computational model for how cells choose temporal or spatial sensing during chemotaxis. PLOS Computational Biology 14, e1005966 (2018)
18.	**Yan XF, Xin L, Yen JT, Zeng Y, Jin S, Cheang QW, Fong RACY, Chiam KH, Liang ZX, Gao YG.** (2018). Structural Analyses Unravel the Molecular Mechanism of Cyclic di-GMP Regulation of Bacterial Chemotaxis via a PilZ Adaptor Protein. Journal of Biological Chemistry, 293, 100 (2018)
19.	**Tan RZ, Lai T, Chiam KH.** (2017). The role of apical contractility in determining cell morphology in multilayered epithelial sheets and tubes. Physical Biology 14, 046003 (2017)
20.	**He C, Chiam KH, Chew LY.** (2016). Comparison of cellular oscillations driven by noise or deterministic mechanisms under cell size scaling. Physical Review E 94, 042425 (2016)
21.	**Xu L, Xin L, Zeng Y, Yam JK, Ding Y, Venkataramani P, Cheang QW, Yang X, Tang X, Zhang LH, Chiam KH, Yang L, Liang ZX.** (2016). A cyclic di-GMP-binding adaptor protein interacts with a chemotaxis methyltransferase to control flagellar motor switching. Science Signaling 9, ra102 (2016)
22.	**Hirata H, Ku WC, Yip AK, Ursekar CP, Kawauchi K, Roy A, Guo AK, Vedula SR, Harada I, Chiam KH, Ishihama Y, Lim CT, Sawada Y, Sokabe M.** (2016). MEKK1-dependent phosphorylation of calponin-3 tunes cell contractility. Journal of Cell Science 129, 3574
23.	**Narematsu N, Quek R, Chiam KH*, Iwadate Y*.** (2015). Ciliary Metachronal Wave Propagation on the Compliant Surface of Paramecium Cells. Cytoskeleton 72, 633 (2015)
24.	**Pieuchot L, Lai J, Loh RA, Leong FY, Chiam KH, Stajich J, Jedd G.** (2015). Cellular subcompartments through cytoplasmic streaming. Developmental Cell 34, 410 (2015)
25.	**Yip AK, Chiam KH*, Matsudaira P*.** (2015). Traction stress analysis and modeling reveal amoeboid migration in confined spaces is accompanied by expansive forces and requires the structural integrity of the membrane-cortex interactions. Integrative Biology 7, 1196
26.	**Tan RZ, Chiam KH.** (2014). Computational modeling reveals that a combination of chemotaxis and differential adhesion leads to robust cell sorting during tissue patterning. PLOS ONE 9, e109286 (2014)

27.	**Hirata H, Chiam KH*, Lim CT, Sokabe M*.** (2014). Actin flow and talin dynamics govern rigidity sensing in the actin-integrin linkage through talin extension. Journal of the Royal Society Interface 11, 20140734 (2014)
28.	**Chng CP, Strange RW.** (2014). Lipid-associated aggregate formation of superoxide dismutase-1 is initiated by membrane-targeting loops. Proteins 82, 3194 (2014)
29.	**Chua JS+, Chng CP+, Moe AA, Tann JY, Goh EL, Chiam KH*, Yim EK*.** (2014). Extending neurites sense the depth of the underlying topography during neuronal differentiation and contact guidance. Biomaterials 35, 7750 (2014)
30.	**Yamauchi S, Hou YY, Guo AK, Hirata H, Nakajima W, Yip AK, Yu CH, Harada I, Chiam KH, Sawada Y, Tanaka N, Kawauchi K.** (2014). p53-mediated activation of the mitochondrial protease HtrA2/Omi prevents cell invasion. Journal of Cell Biology 204, 1191 (2014)
31.	**Koon YL, Koh CG, Chiam KH.** (2014). Computational modeling reveals optimal strategy for kinase transport by microtubules to nerve terminals. PLOS ONE 9, e92437 (2014)
32.	**Ursekar CP, Teo SK, Hirata H, Harada I, Chiam KH, Sawada Y.** (2014). Design and construction of an equibiaxial cell stretching system that is improved for biochemical analysis. PLOS ONE 9, e90665 (2014)
33.	**Phang HQ, Hoon JL, Lai SK, Zeng Y, Chiam KH, Li HY, Koh CG.** (2014). POPX2 Phosphatase Regulates the KIF3 Kinesin Motor Complex. Journal of Cell Science 127, 727 (2014)
34.	**Guo AK, Hou YY, Hirata H, Yamauchi S, Yip AK, Chiam KH, Tanaka N, Sawada Y, Kawauchi K.** (2014). Loss of p53 Enhances NF-kB-Dependent Lamellipodia Formation. Journal of Cellular Physiology 229, 696 (2014)
35.	**Wong ST, Teo SK, Park S, Chiam KH*, Yim EK*.** (2014). Anisotropic rigidity sensing on grating topography directs human mesenchymal stem cell elongation. Biomechanics and Modeling in Mechanobiology 13, 27 (2014)
36.	**Nam SW, Qian C, Kim SH, van Noort D, Chiam KH*, Park S*.** (2013). C. elegans sensing of and entrainment along obstacles require different neurons at different body locations. Scientific Reports 3, 3247 (2013)
37.	**Qian C+, Wong CC+, Swarup S, Chiam KH.** (2013). Bacterial tethering analysis reveals "run-reverse-turn" mechanism for Pseudomonas species motility. Applied and Environmental Microbiology 79, 4734 (2013) (spotlight article)
38.	**Chng CP.** (2013). Effect of simulation temperature on bilayer-vesicle transition studied by coarse-grained molecular dynamics simulations. Soft Matter 9, 7294 (2013)
39.	**Lim FY, Koon YL, Chiam KH.** (2013). A computational model of amoeboid cell migration. Computer Methods in Biomechanics and Biomedical Engineering 16, 1085 (2013)
40.	**Quek R, Lim KM, Chiam KH.** (2013). Three-Dimensional Simulations of Ciliary Flow. In book: Visualization and Simulation of Complex Flows in Biomedical Engineering (pp.197-218), Springer, in press (2013)
41.	**Yip AK+, Iwasaki K+, Ursekar C+, Machiyama H, Saxena M, Chen H, Harada I, Chiam KH*, Sawada Y*.** (2013). Cellular response to substrate rigidity is governed by either stress or strain. Biophysical Journal 104, 19 (2013)
42.	**Lim FY, Chiam KH, Mahadevan L.** (2012). The size, shape, and dynamics of cellular blebs. Europhysics Letters 100, 28004 (2012)

43.	**Vedula SR, Leong MC, Lai TL, Hersen P, Kabla AJ, Lim CT, Ladoux B.** (2012). Emerging modes of collective cell migration induced by geometrical constraints. Proceedings of the National Academy of Sciences of the United States of America 109, 12974 (2012)
44.	**Wee KB, Yio WK, Surana U, Chiam KH.** (2012). Transcription factor oscillations induce differential gene expressions. Biophysical Journal 102, 2413 (2012)
45.	**Tan M, Le DV, Chiam KH.** (2012). Hydrodynamic diffusion of a suspension of elastic capsules in bounded simple shear flow. Soft Matter 8, 2243 (2012)
46.	**Zeng Y, Yip AK, Teo SK, Chiam KH.** (2012). A three-dimensional random network model of the cytoskeleton and its role in mechanotransduction and nucleus deformation. Biomechanics and Modeling in Mechanobiology 11, 49 (2012)
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53.	**Yam C, He Y, Zhang D, Chiam KH, Oliferenko S.** (2011). Divergent strategies for controlling the nuclear membrane satisfy geometric constraints during nuclear division. Current Biology 21, 1314 (2011)
54.	**Chng CP, Tan SM.** (2011). Leukocyte integrin αLβ2 transmembrane association dynamics revealed by coarse-grained molecular dynamics simulations. Proteins 79, 2203 (2011)
55.	**Quek R, Le DV, Chiam KH.** (2011). Separation of deformable particles in deterministic lateral displacement devices. Physical Review E 83, 056301 (2011)
56.	**Quinn DJ, Pivkin I, Wong SY, Chiam KH, Dao M, Karniadakis GE, Suresh S.** (2010). Combined simulation and experimental study of large deformation of red blood cells in microfluidic system. Annals of Biomedical Engineering 39, 1041 (2010)
57.	**Teo SK, Goryachev AB, Parker KH, Chiam KH.** (2010). Cellular deformation and intracellular stress propagation during optical stretching. Physical Review E 81, 051924 (2010)
58.	**Wong SY, Chiam KH, Lim CT, Matsudaira P.** (2010). Computational model of cell positioning, directed and collective migration in the intestinal epithelium. Journal of the Royal Society Interface 7, S351 (2010)
59.	**Vararattanavech A, Chng CP, Parthasarathy K, Tang XY, Torres J, Tan SM.** (2010). A transmembrane polar interaction is involved in the functional regulation of integrin αLβ2.

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61.	**Teo SK, Parker KH, Chiam KH.** (2008). Viscoelastic finite-element modeling of neutrophil deformation in a tapered micropipette. Proceedings of the ASME Summer Bioengineering Conference 2008, 183 (2008)
62.	**Chiu JW, Chiam KH.** (2008). Monte Carlo simulation and linear stability analysis of Turing pattern formation in reaction-subdiffusion systems. Physical Review E 78, 056708 (2008)
63.	**Lai TL, Quek YLR, Chiam KH.** (2007). Computational modeling of the adhesion and deformation of a migrating cell in cancer metastasis. Proceedings of the 3rd Asian-Pacific Congress on Computational Mechanics (2007)
64.	**Quek YLR, Lai TL, Chiam KH.** (2007). Modeling the migration of cancer cells in the bloodstream. Proceedings in Applied Mathematics and Mechanics 7, 2120023 (2007)
65.	**Teo SK, Parker KH , Chiam KH.** (2007). Viscoelastic finite-element modeling of cell deformation in an optical stretcher. Proceedings of the ASME Summer Bioengineering Conference 2007, 259 (2007)
66.	**Chiam KH, Rajagopal G.** (2007). Oscillations in intracellular signaling cascades. Physical Review E 75, 061901 (2007)
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