

Curriculum Vitae: Timothy E Saunders

CONTACT INFORMATION	Dr Timothy Saunders Mechanobiology Institute National University of Singapore T-Lab, #09-03-04 5A Engineering Drive 1, Singapore 117411	<i>E-mail:</i> dbsste@nus.edu.sg <i>Phone:</i> +65 6601 1552 <i>Fax:</i> +65 6872 6123
SUMMARY	I am a biophysicist applying state-of-the-art experimental and computational approaches to advance the understanding of development. I have formed a truly interdisciplinary group, where biologists, microscopists, and biophysicists work together on major problems, such as how complex organ and tissue shape emerges <i>in vivo</i> .	
CURRENT POSITION	Principal Investigator, Mechanobiology Institute and Asst. Prof., Department of Biological Sciences, National University of Singapore Joint-Principal Investigator, Institute of Molecular and Cell Biology, Singapore	
EDUCATION AND ACADEMIC EXPERIENCE	Department of Biological Sciences , National University of Singapore, Singapore <i>Asst. Prof.</i> , September 2013 to current EMBL-Heidelberg , Heidelberg, Germany <i>Post-doctoral researcher</i> , September 2010 to August 2013 John Innes Centre , Norwich, United Kingdom <i>Post-doctoral researcher</i> , October 2007 to August 2010 University of Oxford , Balliol College, Oxford, United Kingdom <i>Graduate Student</i> , October 2004 to September 2007, graduated with <i>D. Phil.</i>	
GRANTS AND AWARDS	<ol style="list-style-type: none">1. NUS-Humboldt University Joint Project Grant (2018)2. MOE AcRF Tier 3: EGFR and FGFR Kinases in Tissue Morphogenesis, multi-PI collaboration (2017-2022)3. MOE AcRF Tier 3: Solving the conundrum of morphogen dynamics during tissue patterning, multi-PI collaboration (2017-2022)4. HFSP Young Investigator Research Grant (2016-2019)5. Singapore National Research Foundation Fellow (2013-2018).	
TEACHING EXPERIENCE	Undergraduate course: Physical Concepts in Biology. Graduate course: Theoretical Biology. Graduate course: An Integrative Approach to Understand Cell Function.	
PUBLICATIONS	† denotes corresponding author. * denotes equal first author. <u>Submitted / In press</u> <ol style="list-style-type: none">1. B. Bosze, B. Mattes, C. Sinner, K. Stricker, V. Gourain, T. Thumberger, S. Tlili, S. Weber, J. Wittbrodt, T. E. Saunders, U. Straehle, A. Schug and S. Scholpp[†]. <i>Pcdh18a-positive tip cells instruct notochord formation in zebrafish.</i> Preprint: https://www.biorxiv.org/content/early/2018/01/31/257717	

2. H. Connahs*, S. Tlili*, J. van Creijl, T. Y. J. Loo, T. Banerjee, T. E. Saunders[†] and A. Monteiro[†]. *Disrupting different Distal-less exons leads to ectopic and missing eyespots accurately modeled by reaction-diffusion mechanisms*. Preprint: <https://www.biorxiv.org/content/early/2017/09/05/183491>
3. J. Yin, R. Lee, Y. Ono, P. W. Ingham[†] and T. E. Saunders[†]. *Slow muscle specification and migration in the myotome is dependent on precise temporal regulation by Shh and non-autonomous FGF signaling*. In press at Developmental Cell
4. K. Karkali, T. E. Saunders, G. Panayotou, E. Martin-Blanco. *The JNK signaling links the CNS architectural organization to motor coordination in the Drosophila embryo*. Preprint: <https://www.biorxiv.org/content/early/2018/05/12/092486>
5. L. Durrieu, D. Kirrmaier, T. Schneidt, I. Kats, M. Knop[†], T. E. Saunders[†] and L. Hufnagel[†]: *Bicoid gradient formation mechanism and dynamics revealed by protein lifetime analysis*, in press at Molecular Systems Biology. Preprint: <https://www.biorxiv.org/content/early/2018/03/13/280834>

Published Research Articles

1. S. Zhang, C. Amourda, D. Garfield and T. E. Saunders[†]. *Selective Filopodia Adhesion Ensures Robust Cell Matching in the Drosophila Heart*. Developmental Cell **46**, 189 (2018)
2. J. Chong*, C. Amourda* and T. E. Saunders[†]. *Temporal development of Drosophila embryos is highly robust across a wide temperature range*. Journal of the Royal Society: Interface **15**, 20180304 (2018)
3. P. Kaur, T. E. Saunders and N. S. Tolwinski[†]. *Coupling optogenetics and light-sheet microscopy to study signal transduction in vivo*. Scientific Reports **7**, 16636 (2017)
4. J.-F. Rupprecht*, K. H. Ong*, J. Yin*, A. Huang, H. H. Q. Dinh, S. Zhang, A. P. Singh, W. Yu[†], and T. E. Saunders[†]. *Geometric constraints induce cellular skew and apical-to-basal neighbor exchange in curved epithelial tissues*. Molecular Biology of the Cell **28**, 3582 (2017)
5. A. Huang*, C. Amourda*, S. Zhang, N. S. Tolwinski and T. E. Saunders[†]. *Decoding temporal interpretation of the morphogen Bicoid in the early Drosophila embryo*, ELife **6**, e26258 (2017)
6. Z. Sun, C. Amourda, M. Shagirov, Y. Hara, T. E. Saunders and Y. Toyama[†]: *Basolateral protrusion and apical contraction cooperatively drive Drosophila germ-band extension*, Nature Cell Biology **19**, 375-383 (2017)
7. A. Singh*, R. Galland*, G. Greci, J.-B. Subarita, V. Studer, V. Viasnoff[†] and T. E. Saunders[†]. *Rapid multiplexed and multiplane fluorescence correlation spectroscopy using single-objective light-sheet microscopy*, Biophysical Journal **112** 133-142 (2017)
8. J. W. Krieger*, A. P. Singh*, N. Bag*, C. S. Garbe, T. E. Saunders, J. Langowski and T. Wohland: *Practical guidelines for imaging fluorescence (cross-) correlation spectroscopy*, Nature Protocols **10**, 1948-1974 (2015)
9. D. Richards[†] and T. E. Saunders[†]. *Spatio-temporal analysis of different mechanisms for interpreting morphogen gradients*, Biophysical Journal **108**, 2061-2073 (2015)
10. T. E. Saunders. *Clustering can create robust concentration gradients by regulating signalling molecule diffusion*, Physical Review E **91**, 022704 (2015)
11. M. Rauzi, U Krzic, T. E. Saunders, M Krajnc, P Zihlerl, L. Hufnagel and M. Leptin. *Embryo-scale integration of tissue mechanics enables gastrulation movements*, Nature Communications **6**, 8677 (2015)
12. K. Pan*, T. E. Saunders*, I. F. Parra*, M. Howard and F. Chang. *Cortical regulation of cell size by a sizer cdr2p*, eLife **3**, e02040 (2014)

13. J. Erceg, T. E. Saunders, C. Giradout, Damien P. Devos, L. Hufnagel and E. E. Furlong. *Subtle changes in motif positioning cause tissue-specific effects on robustness of enhancer activity*, PLoS Genetics **10**, e1004060 (2014)
14. T. E. Saunders*, K. Z. Pan*, A. Angel, Y. Guan, J. V. Shah, M. Howard and F. Chang. *Noise reduction in the intracellular Pom1p gradient by a dynamic clustering mechanism*, Developmental Cell **22**, 558-572 (2012)
15. U. Krzic, S. Gunther, T. E. Saunders, S. Streichan and L. Hufnagel: *Multiview light-sheet microscope for rapid in toto imaging*, Nature Methods **9**, 730-733 (2012)
16. F. He*, T. E. Saunders*, Y. Wen*, D. Cheung, R. J. Jiao, P. R. ten Wolde, M. Howard and J. Ma. *Shaping a morphogen gradient for positional precision*, Biophysical Journal **99**, 697-707 (2010)
17. T. E. Saunders and M. Howard. *When it pays to rush: interpreting morphogen gradients prior to steady-state*, Physical Biology **6**, 046020 (2009) Chosen in Physical Biology “Highlights of the Year 2009”
18. T. E. Saunders and M. Howard. *Morphogen Profiles Can Be Optimised to Buffer Against Noise*, Physical Review E **80**, 041902 (2009) Recommended by Faculty of 1000
19. A. Andrianov, J. T. Chalker, T. E. Saunders and D. Sherrington. *Spin glass transition in geometrically frustrated antiferromagnets with weak disorder*, Physical Review B **81**, 014406 (2010) This paper was an Editor’s Suggestion of the month
20. T. Pickles, T. E. Saunders and J. T. Chalker. *Critical phenomena in a highly constrained classical spin system: Neel ordering from the Coulomb phase*, Europhysics Letters **84**, 36002 (2008)
21. T. E. Saunders and J. T. Chalker. *Structural phase transitions in geometrically frustrated antiferromagnets*, Physical Review B **77**, 214438 (2008)
22. T. E. Saunders and J. T. Chalker. *Spin Freezing in Geometrically Frustrated Antiferromagnets with Weak Disorder*, Physical Review Letters **98**, 157201 (2007)

Reviews and Commentaries

1. G. Bauer, N. Fakhri, A. Kicheva, J. Kondev, K. Kruse[†], H. Noji, D. Riveline[†], T. E. Saunders, M. Thattai, and E. Wieschaus. *The Science of Living Matter for Tomorrow*. Cell Systems **6**, 400-402 (2018)
2. T. E. Saunders[†] and P. W. Ingham[†]. *Editorial: MoD Special Issue celebrating 100 years since “On Growth and Form” by D’Arcy Wentworth Thompson*. Mechanisms of Development **145**, 1 (2017)
3. T. E. Saunders. *Imag(in)ing growth and form*. Mechanisms of Development **145**, 13-21 (2017)
4. C. Amourda and T. E. Saunders[†]. *Gene expression boundary scaling and organ size regulation in the Drosophila embryo*. Development, Growth & Differentiation **59**, 21-32 (2017)

Education and Teaching Articles

1. T. E. Saunders[†], C. Y. He, P. Koehl, L. L. S. Ong and P. T. C. So. *Eleven quick tips for running an interdisciplinary short course for new graduate students*. PLoS Computational Biology **14**, e1006039 (2018)
2. A. P. Singh, A. Gupta, R. Gulvady, A. Mhamane and T. E. Saunders[†]: *“Science is Fun” Performing Effective and Cheap Scientific Outreach*, Science in Schools **34** (2015)
3. T. E. Saunders: *The physics of crowds*, Science in Schools **21** (2011)

SELECTED INVITED
CONFERENCE
PRESENTATIONS

1. EMBO Workshop on Size and Shape, Bangalore, September 2018
 2. World Congress on Biomechanics, Dublin, July 2018
 3. International Union of Biochemistry and Molecular Biology Congress, Seoul, June 2018
 4. HFSP Annual Meeting, Lisbon, July 2017
 5. International Congress of Developmental Biology, Singapore, June 2017
 6. Light-sheet Fluorescence Microscopy International Conference, Singapore, June 2017
 7. The Interface of Biology and Theoretical Computer Science, Bangalore, December 2016
 8. Biophysical Society Annual Meeting, Los Angeles, February 2016
 9. International Conference of Systems Biology, Singapore 2015
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CONFERENCE
ORGANISATION

1. Joint NUS-HU workshop on Patterning and Timing in Development and Evolution, February 2018 (co-organiser)
 2. 3rd International Symposium on Mechanobiology, Singapore, December 2017 (MBI committee member)
 3. International Congress of Developmental Biology, Singapore, June 2017 (local organisation committee)
 4. Light-sheet Fluorescence Microscopy International Conference, Singapore, June 2017 (co-organiser)
 5. Mechanobiology of Development and Multicellular Dynamics, Singapore, December 2014 (MBI committee member)
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PROFESSIONAL
AFFILIATIONS

1. Institute of Physics (since 2000). Full elected member since 2018.
2. Biophysical Society (since 2015)
3. British Society of Developmental Biology (since 2015)