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Recent Papers

H Shoaib, A Madamanchi, E Pienaar, DM Umulis, ME Cardella. 2022. "I Think I Am Getting There"

Understanding the Computational Identity of Engineering Students Participating in a Computationally Intensive Thermodynamics Course. *Biomed Eng Education* (2022).

<https://doi.org/10.1007/s43683-022-00084-1>

A Pawar, L Li, AK Gosain, DM Umulis, AB Tepole. 2022. PDE-constrained shape registration to characterize biological growth and morphogenesis from imaging data. *Engineering with Computers* 38, 3909-3924. doi.org/10.1007/s00366-022-01682-x

M Thompson, V Munnamalai, DM Umulis. 2022. Early precision of radial patterning of the mouse cochlea is achieved by a linear BMP signaling gradient and is further refined by SOX2. *bioRxiv* doi: <https://doi.org/10.1101/2022.08.30.505910>.

M Ingle, A Madamanchi, AP Hinck, DM Umulis. 2022. Computational modeling of TGF- β 2: T β RI: T β RII receptor complex assembly as mediated by the TGF- β co-receptor betaglycan. *bioRxiv* doi: <https://doi.org/10.1101/2022.08.30.505910>.

M Thompson, V Munnamalai, D Umulis. 2021. Interpreting Positional Information in the Developing Organ of Corti. 2021 AIChE Annual Meeting.

MS Karim, A Madamanchi, JA Dutko, MC Mullins, DM Umulis. 2021. Heterodimer-heterotetramer formation mediates enhanced sensor activity in a biophysical model for BMP signaling. *PLoS computational biology* 17 (9), e1009422.

TC Wu, X Wang, L Li, Y Bu, DM Umulis. 2021. Automatic wavelet-based 3D nuclei segmentation and analysis for multicellular embryo quantification. *Scientific reports* 11 (1), 1-13.

A Madamanchi, MC Mullins, DM Umulis. 2021.

Diversity and robustness of bone morphogenetic protein pattern formation. *Development* 148 (7), dev192344.

X Wang, L Li, Y Bu, Y Liu, TC Wu, DM Umulis. 2021. Quantitative imaging in whole-mount zebrafish embryos traces morphogen gradient maintenance and noise propagation in BMP signaling. *bioRxiv* doi: <https://doi.org/10.1101/2021.11.05.467413>.

M Ku, X Wang, D Umulis. 2020. pSmad 3D Localization in Zebrafish Embryos. *Proceedings of IMPRS*. 2020 Dec 15;3(1).

L Burzawa, L Li, X Wang, A Buganza-Tepole, DM Umulis. 2020. Acceleration of PDE-based biological simulation through the development of neural network metamodels. *Current pathobiology reports* 8 (4), 121-131.

W Zhou, AY Hsu, Y Wang, R Syahirah, T Wang, J Jeffries, X Wang, H Mohammad, MN Seleem, D Umulis, Q Deng. 2020. Mitofusin 2 regulates neutrophil adhesive migration and the actin cytoskeleton. *Journal of cell science* 133 (17), jcs248880.

FB Tuazon, X Wang, JL Andrade, D Umulis, MC Mullins. 2020. Proteolytic restriction of chordin range underlies BMP gradient formation. *Cell reports* 32 (7), 108039.

V Munnamalai, C Young, M Thompson, A Fister, D Umulis, D Fekete. 2020. The acquisition of positional information in the developing cochlea. *The FASEB Journal* 34 (S1), 1-1.

AY Hsu, D Wang, S Liu, J Lu, R Syahirah, DA Bennin, A Huttenlocher, DM Umulis, J Wang, Q Deng. Phenotypical microRNA screen reveals a noncanonical role of CDK2 in regulating neutrophil migration (vol 116, pg 18561, 2019).