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hiPSC-derived 3D cardiac microtissue models with integrated immune cells and vasculature

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Curriculum Vitae

Ulgu Arslan was born and grew up in Turkey where she completed a Bachelor degree in Molecular Biology and Genetics in Bilkent University, Ankara. After graduation, Ulgu moved to Belgium where she obtained a Master degree in Biomedical Science with a specialization in Neuroscience at University of Antwerp. The topic of her master thesis was “Characterization of electrophysiological and morphological differences between KCNQ2 related benign familial neonatal epilepsy and developmental and epileptic encephalopathy using hiPSC-derived 2D neurons and 3D brain organoids”.

After completion of her Master degree, she moved to the Netherlands where she worked as a PhD fellow at Leiden University Medical Centre at the department of Anatomy and Embryology. Here, she carried out research in the group of Dr. Valeria Orlova, with Prof. Dr. Christine Mummery as her promoter. The main project in her PhD was the “Development of a hiPSC-derived vascularized 3D cardiac microtissues using organ-on-chip technologies”. This project was supported by the Marie-Curie International Training Network as part of the European Organ-on-Chip consortium (EUROoC), and the Novo Nordisk Foundation. In addition, she worked on a project entitled “Integration of hiPSC-derived immune components in 3D cardiac microtissues”.

The results of her research are presented in this thesis.

List of Publications

Perspectives for Future Use of Cardiac Microtissues from Human Pluripotent Stem Cells.

Arslan, U., Orlova, V. V., and Mummery, C. L. 2022b. ACS Biomaterials Science and Engineering 8(11):4605-4609. doi: 10.1021/acsbiomaterials.1c01296.

Microphysiological stem cell models of the human heart.

Arslan, U.#, Moruzzi, A.#, Nowacka, J.#, Mummery, C. L., Eckardt*, D., Loskill, P.*, and Orlova, V. V.* 2022a. Materials Today Bio 14:100259. doi: 10.1016/j.mtbio.2022.100259
#Joint first authorship

Software Tool for Automatic Quantification of Sarcomere Length and Organization in Fixed and Live 2D and 3D Muscle Cell Cultures *In Vitro*.

Stein, J. M., Arslan, U., Franken, M., De Greef, J. C., Harding, S. E., Mohammadi, N., Orlova, V. V., Bellin, M., Mummery, C. L., and Van Meer, B. J. 2022. Current Protocols in Human Genetics 2(7):e462. doi: 10.1002/cpz1.462.

Vascularized hiPSC-derived 3D cardiac microtissue on chip.

Arslan, U., Brescia, M., Meraviglia, V., Nahon, D. M., van Helden, R. W. J., Stein, J. M., van den Hil, F. E., van Meer, B. J., Vila Cuenca, M., Mummery, C. L., Orlova V. V. 2023. Stem Cell Reports 18:1394–1404. doi: 10.1016/j.stemcr.2023.06.001.

Generation and characterization of hiPSC-derived vascularized-, perfusable cardiac microtissues-on-chip

Arslan, U., van den Hil, F. E., Mummery, C. L., Orlova V. V. 2024. Current Protocols:Stem Cell Biology. doi: 10.1002/cpz1.1097.

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To each member of Stem Cell Group, and with a special thanks to Nikola, Linda, Cyriel, Maury, Ruben, Mehmet, Celine, and Ouafa I wish to express my gratitude for the enriching brainstorming sessions, shared laughter, and moments of anticipation. Despite being physically separated by floors and even buildings with some of you, I deeply felt your support in every encouraging word and gesture.

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