# Influence of boundary conditions on oxygen distribution in an organ-on-a-chip platform

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**Key Words:** *Numerical simulations, Organ-on-a-chip, Fluid flow.*

Organ-on-a-chip (OoC) platforms have revolutionized the drug development process by offering an effective alternative to animal models. These advanced microfluidic platforms models mimic the organ functions at a microscale and they can be produced at a large-scale and at a lower price [1,2]. Despite the variety of OoC models developed up to now, the combination of numerical simulations with experimental procedures has been paramount in the development of more realistic and effective OoC devices [3]. Besides, a better understanding of the physical phenomena involved can be obtained.
In the present work, fluid flow numerical simulations were carried out in an organ-on-a-chip aiming to evaluate the influence of imposing different velocities at the inlet on the oxygen distribution along the device. This is of great importance to understand if the oxygen that reaches the cells is adequate for their maintenance. The results showed that for the geometry tested, with four organoids in parallel, by increasing the inlet velocity, the dissolved oxygen where cells are cultured also increases. This proves the importance of using numerical simulations for improving the experimental tests and, consequently, the validity of the results.

## ACKNOWLEDGEMENTS

This work has been supported by FCT within the R&D Units Project Scope: UIDB/00319/2020, UIDB/04077/2020, UIDB/04436/2020, and NORTE-01-0145-FEDER-030171 (PTDC/EMD-EMD/30171/2017) and EXPL/EME-EME/0732/2021, NORTE-01-0145-FEDER-029394 funded by COMPETE2020, NORTE 2020, PORTUGAL 2020. Violeta Carvalho would like to express their gratitude for the support given by FCT through the PhD Grant SFRH/UI/BD/151028/2021

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