



Universidade do Minho



Annual report: 1<sup>st</sup> year of the FCT Individual PhD Grant,  
2019/2020

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Braga, 29<sup>th</sup> of July 2020

During the first year of this project, it was proposed to start task 1, namely the development of a microfluidic methodology to tailor with high precision the size and structure of lipoplexes for gene delivery. Also, the first year corresponds with the beginning of the MAP-fis courses. Also, I was able to provide an oral communication in the Jornadas CF-UM-UP, where I could demonstrate the work developed during my master and beginning of the PhD on how to control the lipid particles size using hydrodynamic focusing in microfluidic devices.

I would like to mention that I was accepted for the 24th JCNS Laboratory Course -Neutron Scattering 2020, held in Germany. However, due to the current pandemic state the course was cancelled, and the organizing committee provided the material so that the applicants could study and apply again for the next year edition.

### MAP-fis courses:

After the start of the courses, all the classes undertaken were successfully completed, Table 1.

Course	Mark	Observation
Entrepreneurship	17	Completed
Nanomedicine	19	Completed
Biophotonics: sensing and imaging	17	Completed
Advanced Materials Preparation and Characterization	18	Completed
Topics in Advanced Physics II	_____	Ongoing
Assay	_____	18th of September

The curricular units highlighted are part of the Topics in Advanced Physics I, whose overall average is 18.

### Task 1:

Despite of the pandemic situation that limited my access to the INL facilities, we were able to achieve important steps for this task. Now we were looking not only for PDMS as a material to build microfluidic devices, but we are also considering other materials that allow us to use 3D printing.

Also, we have been using the Dean flow phenomena for 3D focusing of streams inside the microfluidic channels, which can help us to control the size of the lipoplexes.