NCBIO
ERA CHAIR

D4.4 Report on the Neural Cell Biology Doctoral Training Plan

Funded by
the European Union

The project NCBio received
funding from the European Union's
Horizon 2020 research and
innovation programme under
Grant Agreement no. 951923.

Report on the Neural Cell Biology Doctoral Training Plan

Project Documentation Sheet	
Project	NCBio: Unlocking Excellence in Research and Innovation in Neurobiology and Neurological Disorders at IBMC/i3S
Acronym	NCBio
Grant Agreement nº	951923
Call identifier	H2020-EU.4. C. - ESTABLISHING ‚ERA CHAIRS' WIDESPREAD-06-2020 - ERA CHAIRS
Start date of the project	1.1.2021
Duration	72 months
Project Officer	David Monteiro
Coordinator	Mónica Sousa (IBMC)
Partners	Instituto de Biologia Molecular e Celular- IBMC

Deliverable Documentation Sheet	
Number of deliverable	D4.4
Title	Neural Cell Biology Doctoral Training Plan
Related WP	WP4 - Neural Cell Biology Research and Innovation strategy
Lead Beneficiary	IBMC
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Nature of the deliverable	Report
Dissemination level	Public
Due Date	31.01.2024 (M37)
Date of submission	25 January 2024
Status of the document	1st draft by Olga Sin on January 16, 2024 1st draft reviewed by Matthew Holt on January 17, 2024 Final Version approved by Mónica Sousa on January 22, 2024
Version	Version 1.0

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Abbreviations and Acronyms

Abbreviation Acronym	Definition
GA	Grant Agreement
D	Deliverable
IBMC	Institute for Molecular and Cell Biology
i3S	Institute for Research and Innovation Health
M	Month
WP	Work package
NCBio	Neural Cell Biology
SBG	Synapse Biology Group
PDN	Doctoral Program in Neurosciences
MCBiology	Doctoral Program in Molecular and Cell Biology
University of Porto	U. Porto

Executive Summary

Following the set-up and launch of the Synapse Biology Group research activities, the ERA Chair Holder (Dr. Matthew Holt) was integrated into the existing doctoral programmes at the IBMC/i3S based at the University of Porto. The IBMC and all other i3S institutes are located in campus and have very well-established links with the U. Porto. Many of the i3S researchers are professors and/or lecturers at U. Porto and some also work at the university's hospital centers. This professional symbiosis and physical proximity will be leveraged through Dr. Holt to create a good knowledge ground in Neural Cell Biology among young researchers. Additionally, the participation of Dr. Holt in the doctoral programs and his contact with students will also be a good opportunity to attract and recruit Ph.D. candidates to the Synapse Biology Group as the lab continues to evolve over the years.

Upgrade of Doctoral Programmes: Neural Cell Biology Module

According to task 4.3 within WP4 (Annex 1, part A) of the Grant Agreement (GA), the ERA Chair Holder is expected to contribute to the existing doctoral programs by designing a new module on Neural Cell Biology.

Dr. Holt has already met the coordinators and lecturers of the Molecular and Cellular Biology (MCBiology) and Neuroscience (PDN) doctoral programs to gain insights into the educational agenda and has been officially integrated in both doctoral programs since March 2022.

A general consensus was reached to re-design the existing neuroscience modules instead of creating a new module on Neural Cell Biology. Concretely, the neuroscience modules in **both programs have now been updated to include more topics dedicated to glia biology** (see Table 1 for PDN and http://www.mcbiology.up.pt/structure-and-calendar/#courseI for MCBiology). Dr. Holt introduced the lecture "**Astrocytes and the Tripartite Synapse**" which has received very positive feedback from the director of the PDN, Dr. Vasco Galhardo (group leader at the IBMC/i3S and Faculty of Medicine at U. Porto).

Dr. Holt currently delivers **three 2-hour lectures per doctoral program** (totaling 12 hours), plus follow up questions and interactions with students which varies from lecture to lecture.

Based on the unique expertise in the Porto region in these techniques—and to complement the students' training—Dr. Holt proposed that **proteomics** and **sequencing methods** be added to the neuroscience modules. These topics will be taught starting the second semester of 2024.

In terms of mentoring, Dr. Holt is supervising Mr. João Guimarães, Ms. Rafaela Seixas (Ph.D. candidates) and Ms. Luísa Florido (M.Sc. student) in his lab. The time dedicated to mentoring well exceeds 15 minutes per day as anticipated by the GA. Dr. Holt is also a mentor to Mr. Clive Jabangwe. Mr. Jabangwe sought his mentorship as a Ph.D. candidate in the Neuro & Skeletal Circuits group led by Dr. Meriem Lamghari (IBMC/i3S) and is now pursuing his post-doctoral research at the University of Nottingham, United Kingdom.

Dr. Holt was invited to become part of the thesis committees of Ms. Sara Silver, a Ph.D. candidate of the Molecular and Cellular Biotechnology Applied to Health Sciences (BiotechHealth) Doctoral

Programme at ICBAS and of Ms. Georgia Athanasopoulou, a Ph.D. candidate in the NanoBiomaterials for Targeted Therapies, led by Dr. Ana Paula Pêgo at the IBMC/i3S.

Finally, Dr. Holt has been asked to participate as a **faculty member on the new MD/Ph.D. program** to launch next year on neurodegenerative diseases.

Table 1. Educational agenda for the PND, including more lectures dedicated to glia biology (bold).

Lecture	Lecturer
Introduction to Neurobiology	Vasco Galhardo (Group Leader at IBMC/i3s and Director of the PND)
Perspective on Current Neuroscience Research	Vasco Galhardo (Group Leader at IBMC/i3s and Director of the PND)
The Neuronal Membrane: Structure, Transport, Ion Channels, Synaptic Transmission and Excitability	Boris Safronov (Group Leader at IBMC/i3s)
Input Transmission, Action Potential and Axonal Conductance	Boris Safronov (Group Leader at IBMC/i3s)
General considerations on the glial system: types, morphology, ultra-structure and basic mechanisms	Fani Neto (Assistant Professor, University of Porto)
Neuron-Glial Interaction	Fani Neto (Assistant Professor, University of Porto)
Astrocytes and the Tripartite Synapse	**Matthew Holt (ERA Chair Holder and Group Leader of the SBG)**
Glial Cells and Myelination	João Relvas (Group Leader at IBMC/i3s)
Microglia and Neuroinflammation	João Relvas (Group Leader at IBMC/i3s)
Student Seminars	Fani Neto / Carlos Reguenga (director of Master in Neurobiology of the U. Porto)