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Annual Progress Report 1 (M1-M12)

WP6 – D6.3 – D28

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1. Document Information and Introduction

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Introduction

This document is the first annual progress report for Syn2Psy which relates to the first year of this MSCA-ITN. Hereby we provide information on the scientific and training progress of the project. We then describe in detail the recruitment process for the 14 Early Stage Researchers (ESRs). We report how the initial career development plan for each ESR was prepared. We also summarize the first Syn2Psy network school and the enrollment of the ESRs in PhD programs. We provide information on the management of the action (kick-off meeting, internal website and data management plan). The communication and dissemination activities that happened so far are also described (public website, social media, science outreach and work with partners). We finish by very briefly discussing the impact of the action on this first year. We asked the ESRs to send us a paragraph on their scientific and training progress, which we compile in the Annex 1 of this annual report.

2. General progress of the action

All ESR projects started between September and October 2019 and have been progressing normally according to the plan. All ESRs are enrolled in the local PhD programmes and the first Network School took place in September, immediately after the kick-off meeting. The deliverables and milestones have been accomplished according to the plan (**tables 1 and 2**).

WP	Deliverable	Title	Lead Beneficiary	Receipt Date
WP4	D4.9 D42	Supervisory board	CNC	9-08-2019
WP6	D6.8 D41	Consortium agreement	CNC	3-10-2019
WP5	D5.3 D34	Public media dissemination	CNC	7-10-2019
WP6	D6.1 D22	Report on the Kick-off meeting	CNC	16-10-2019
WP4	D4.2 D24	Report on network school 1 (NS1)	CNC	16-10-2019
WP5	D5.1 D29	Syn2Psy public website	CNC	19-11-2019
WP6	D6.2 D23	Syn2Psy internal website	CNC	19-11-2019
WP6	D6.9 D43	Data Management Plan	CNC	13-12-2019
WP4	D4.6 D32	Career development plan of ESRs	CNC	31-01-2020
WP6	D6.3 D28	Annual progress report 1	CNC	28-02-2020
WP7	D7.1 D45	H - Requirement No. 1	CNC	28-02-2020
WP7	D7.2 D46	HCT - Requirement No. 2	CNC	28-02-2020
WP7	D7.3 D47	POPD - Requirement No. 3	CNC	28-02-2020
WP7	D7.4 D48	A - Requirement No. 4	CNC	28-02-2020
WP7	D7.5 D49	EPQ - Requirement No. 5	CNC	31-01-2020
WP7	D7.6 D50	GEN - Requirement No. 6	CNC	31-01-2020

Table 1: Deliverables submitted up to this date.

Milestones	Title	Lead Beneficiary	Delivery Date
6	Public Website	CNC	1-03-2019
3	Accomplished ESR recruitment	CNC	22-07-2019
1	Kick-off meeting	CNC	26-09-2019
2	Syn2Psy internal website	CNC	19-11-2019
4	Designing Research/Outreach plan	CNC	31-01-2020
5	Annual progress report 1	CNC	28-02-2020

Table 2: Milestones delivered up to this date.

3. Recruitment strategy

3.1. Announcement

The ESR positions were advertised in EURAXESS, Era Careers, FEBS Job Market, in the webpages of the research centres where the action takes place, and through mailing lists from past and present collaborators and colleagues from the researchers. The candidates applied through the action website (www.syn2psy.eu) stating their project preference by ranking 3 projects as first, second or third preference. The applications included a Motivation Letter, Curriculum Vitae and contacts from 2 references. Applications were only accepted through the website with the deadline on 15-05-2019.

The eligibility criteria, described on the application section of the website were:

1) MSc holder;
2) Not a PhD-holder;
3) Up to 4 years (full-time equivalent) of research experience;
4) Up to 12 months in the last 36 leading to the recruitment, in the country hosting the ESR Position;
5) Capacity to work in a multidisciplinary team, in an international environment and independently;
6) Strong interest in research and science;
7) Excellent English communication skills, orally as well as in scientific writing.

The following announcement was written and disseminated as described above:

Syn2Psy call for applications is open | Deadline: May 15, 2019

Applications are invited for 14 Early Stage Researcher PhD positions funded by the Innovative Training Network "Syn2Psy-Synaptic Dysfunction in Neuropsychiatric Disorders", an European Union H2020 Marie Sklodowska-Curie Action. Syn2Psy is a consortium of 7 toplevel academic research institutions and 5 non-academic leading organisations, located in Portugal, UK, France, Switzerland, Denmark and Germany Syn2Psy provides PhD-level training to integrate molecules, synapses, neurons, circuits and behaviour, to understand and treat neuropsychiatric disorders.

Syn2Psy scientific aims are to: 1) Identify synaptic mechanisms that are dysfunctional in neuropsychiatric disorders; 2) Generate and characterize human cell-derived and animal models of disease that will inform on neuronal pathways that are disrupted and may be targets for therapies; 3) Test rational therapies and understand how life stress impacts on disease pathways. Syn2Psy leverages on a multidisciplinary research team involving scientists with a comprehensive know-how in the field of neuroscience, ranging from molecular and cellular studies to neurophysiology, neuronal circuits, neural dynamics and behaviour, complemented by specialists from the pharmaceutical sector, optical microscopy and digital imaging technology and healthcare providers. This combination of interdisciplinary and intersectoral expertise is particularly suited for addressing synapse pathology in neuropsychiatric disorders, and to provide cuting-edge advanced training for young researchers looking to head-start a science-driven career and contribute to answer a critical societal challenge.

Highly motivated candidates can submit their application through the Syn2Psy website. Deadline for submission is May 15, 2019.

The positions will be hosted at the following organizations:

- *CNC-Center for Neuroscience and Cell Biology, University of Coimbra, Coimbra, Portugal*
- *Ecole Polytechnique Fédérale de Lausanne - Brain and Mind Institute, Lausanne, Switzerland*
- *Interdisciplinary Institute for Neuroscience - Centre National de la Recherche Scientifique (CNRS), Bordeaux University, Bordeaux, France*
- *Imperial College London, London, UK*
- *Neuroscience Paris-Seine, CNRS, INSERM, Sorbonne University, Paris, France*
- *Lundbeck, Copenhagen, Denmark*
- *Centre for Discovery Brain Sciences (CDBS) - University of Edinburgh, Edinburgh, Scotland*

The Syn2Psy team also includes the following partner organizations:

- *Carl Zeiss Microscopy GmbH, Germany*
- *CTI - Clinical Trial and Consulting Services, PT-USA*
- *Coimbra University Hospital, Portugal*
- *Portuguese Institution for Children Development, Lisbon, Portugal*
- *Marionet theatre company, Coimbra, Portugal*

The Research Coordination Committee (RCC) prepared evaluation forms both for the curricular analysis (**table 3**) and for interviews (**table 5**) and proposed the recruitment procedures to be implemented and respective deadlines (below):

1.) Shortlisting (until June 7)
Supervisors propose a list of applicants for shortlisting. Naturally, each focuses on the candidates with their project "first choice" but all supervisors can shortlist any of the applicants. An evaluation form is produced for each candidate (even for those that are not shortlisted). At least 3 candidates need to be shortlisted for each position.

2.) Initial Interview (local selection) (until June 21)
Among the shortlisted candidates, each PI performs Skype interviews with those shortlisted candidates that marked their project as "first choice project". Each PI selects 1 candidate as their first choice. Subsequently (if necessary), shortlisted candidates except of PI's "first choice candidate", may be interviewed by the PI of the "second choice project", etc. These interviews need to follow local institutional rules. A research paper will be sent to the candidates to be interviewed, for discussion during the interview.

3.) Confirmation (RCC and across consortium) (until July 28)
The RCC checks the choices made for all positions. Subsequently, at a consensus stage all PIs have the opportunity to confirm or oppose the choice done by each PI for their project.

4.) Candidates are contacted (before July 5).
In case a candidate does not accept the position, the next candidate in the ranking will be contacted.

It was up to each PI to make sure that local recruitment rules were followed and that students applied to the local doctoral programs in due time.

The RCC sent the prepared guidelines and evaluation forms to the supervisory board (SB) members for ultimate approval. After the SB approval the documentation was sent to all Principal Investigators (PIs).

3.2. Candidate Selection

In total 141 candidates applied to the Syn2Psy ESR positions. Initially, 16 candidates (11,3%) were considered ineligible due to reasons such as: being already a PhD holder, having stayed for more than 12 months in the last 3 years in the host country, or having longer research experience than 4 years.
The PIs received a list of the eligible candidates and their 3 project preferences. This list also contained candidates which eligibility was uncertain - some of these candidates were considered ineligible later due to the fact that they haven't finished their Master programme at the time of recruitment.
The PIs applied the evaluation criteria to shortlist the candidates, using the initial screening evaluation form (**table 3**):

Criteria	**Key**	**Score**
1. Curriculum Vitae analysis		70
Academic grades	Percentage values/10	10
Work experience/international experience	* International / or related experience =10 * Unrelated experience = 5	10
Publications	* First author in Q1 journal = 10 * Mid author in Q1 journal = 5 * First author in journal without IF = 1 * First author in Q1 journal in another scientific area = 5 * Mid author in Q1 journal in another scientific area = 2.5	20
Communications in scientific meetings	* 1 / communication * 0.5/ communication in another scientific area	5
Prizes/fellowships	* 1 / prize or fellowship	5
English knowledge[&]	C2/C1/fluent = 20; B2 = 15; B1 = 10; A2 = 5	20
2. Motivation letters	Great – 15; Convincing – 10; OK - 5	15
3. Reference letters[#]	Great – 15; Convincing – 10; OK - 5	15
Total (1+2+3)		**100**

Table 3: Initial screening evaluation form with the criteria used to evaluate each candidate and shortlist them. [[#]Confirm that letterhead paper was used and the document is signed; [&]Language (English) skills - official scoring.]

The highest scored candidates were shortlisted by the PIs mostly taking in consideration the candidate's first option. It is worth mentioning that ultimately the best candidate was chosen (even if the specific position was 2nd or 3rd preference).
In total 50 eligible candidates were shortlisted as their first choice (**table 4**). Some candidates were shortlisted by more than one PIs (24 candidates). If the same candidate was selected for interview by more than one PI, and offered a position in more than one laboratory, the candidate had the ultimate choice regarding the laboratory and project (independently on the candidate's initial preference).

ESR	Applicants 1st Choice (shortlisted)	Applicants as 2nd Choice (shortlisted)	Applicants as 3rd Choice (shortlisted)	Other shortlisted applicants
ESR1	8 (4)	11	10	
ESR2	7 (4)	3 (2)	3	
ESR3	16 (9)	12 (2)	9 (2)	
ESR4	4 (1)	8 (2)	12 (1)	1
ESR5	3 (2)	8 (2)	12	
ESR6	15 (5)	9	6	
ESR7	3 (2)	5 (3)	7	
ESR8	15 (5)	18 (1)	9	
ESR9	12 (3)	10 (2)	19 (1)	
ESR10	6 (1)	11 (2)	10 (3)	
ESR11	17 (5)	10	8	
ESR12	9 (2)	4 (2)	6 (3)	
ESR13	4 (2)	9 (3)	4	
ESR14	6 (5)	7 (1)	8	1

Table 4: Number of eligible candidates that applied to each ESR project as their 1st, 2nd and 3rd choice. The number of shortlisted candidate is in parentheses.

Most shortlisted candidates were interviewed on Skype by a panel of 2-4 evaluators, in which the chair was the PI. The candidates were evaluated using criteria decided by the RCC (**table 5**). The highest scored candidate was officially offered the position (**table 6**).

Interview questions	Criteria analysed	Score
1. Scientific background		50
Ability to describe and critically evaluate past research experience	Clarity, Concision	15
Knowledge of science in general and of Syn2Psy in particular	Significance	10
Ability to critically discuss a scientific topic	Clarity, Significance	15
Expertise in techniques relevant for the project	Pertinence	10
2. Motivation for the project		25
Reasons for choosing Syn2Psy	Significance	10
Drive and motivation for the work	Significance	15
3. Long-term career plans	Significance	10
4. English	Pertinence	15
TOTAL SCORE (1+2+3+4)		**100**

Table 5: Interview evaluation form with the questions and criteria used to evaluate each candidate. [Key to indicate whether the candidate meets selection criteria: 0% - does not meet criteria; 30% - meets some of the criteria; 60% - meets most of the criteria; 80% meets all of the criteria; 100% - exceeds criteria.]

ESR	Interviewed applicants	Selected Candidate (choice)
ESR1	4	Orsolya Antal (1st)
ESR2	5	Alessandro Chioino (2nd)
ESR3	11	Giuseppe Cammarata (1st)
ESR4	4	Diogo Soares (1st)
ESR5	4	Marcos Sintes (2nd)
ESR6	2	Daniel Hunter (1st)
ESR7	5	Elisa Corti (1st)
ESR8	6	Elizabeth Brockman (2nd)
ESR9	5	Laura Upton (1st)
ESR10	4	Flavio Tomasi (1st)
ESR11	5	Ágata Silván (1st)
ESR12	6	Manuela Rizzi (3rd)
ESR13	5	Loredana Cumpana (2nd)
ESR14	7	Vanesa Salazar (n/a)

Table 6: Number of interviewed candidates per ESR project and the final selected candidate. In parenthesis is the ESR project preference of the selected candidate.

3.3. Analysis of the selected candidates

The selected candidates have an age comprised between 23 and 28 years old, come from 8 different countries and have in the majority a Neurosciences background. Both genders are nearly equally represented (**table 7** and **figure 1**).

ESR	Candidate's Name	Birthday	Age	Country of Nationality	Gender	Academic Background
ESR1	Orsolya Antal	17-09-1996	23	Hungary	Female	Pharmacology
ESR2	Loredana Cumpana	15-12-1993	26	Romenia	Female	Biology
ESR3	Giuseppe Cammarata	20-01-1994	25	Italy	Male	Neurosciences
ESR4	Diogo Soares	07-04-1991	28	Portugal	Male	Neurosciences
ESR5	Marcos Sintes	12-01-1994	25	Spain	Male	Biotechnology
ESR6	Daniel Hunter	08-05-1995	24	United Kingdom	Male	Neurosciences
ESR7	Elisa Corti	17-05-1994	25	Italy	Female	Neurosciences
ESR8	Elizabeth Brockman	24-02-1995	24	Canada	Female	Neurosciences
ESR9	Laura Upton	16-06-1996	23	United Kingdom / New Zealand	Female	Neurosciences
ESR10	Flavio Tomasi	24-09-1994	25	Italy	Male	Neurosciences
ESR11	Ágata Silván	19-12-1993	26	Spain	Female	Neurosciences
ESR12	Manuela Rizzi	06-11-1994	25	Italy	Female	Biotechnology
ESR13	Alessandro Chioino	18-02-1993	26	Italy	Male	Neurosciences
ESR14	Vanesa Salazar	24-08-1996	23	Spain	Female	Neurosciences

Table 7: Selected Syn2Psy Early Stage Researchers profile by age, nationality, gender and academic background

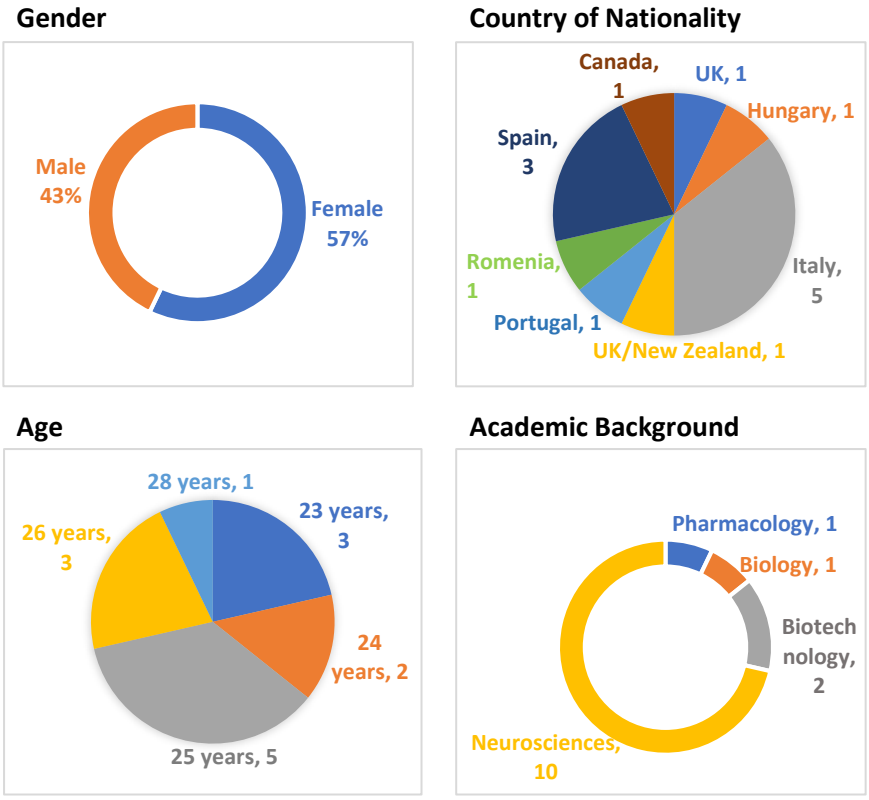


Figure 1: Selected Syn2Psy Early Stage Researchers by gender, nationality, age and academic background.

3.4. ESR researchers declaration

The employment contracts of the ESRs started between September and October 2019 and have a duration of 36 months in full time and exclusive work for the action (100%) (**table 8**). Additionally, the ESRs are all enrolled in a PhD programme.

ESR	Name	Recruitment Organisation	Start Date	End Date	Working Time	Duration
ESR1	Orsolya Antal	CNC	24-09-2019	23-09-2022	Full Time	36
ESR2	Loredana Cumpana	BMI-EPFL	01-09-2019	31-08-2022	Full Time	36
ESR3	Giuseppe Cammarata	CNC	06-09-2019	05-09-2022	Full Time	36
ESR4	Diogo Soares	IINS-CNRS	25-09-2019	24-09-2022	Full Time	36
ESR5	Marcos Sintes	ICL	18-09-2019	17-09-2022	Full Time	36
ESR6	Daniel Hunter	IINS-CNRS	01-10-2019	31-09-2022	Full Time	36
ESR7	Elisa Corti	CNC	09-09-2019	08-09-2022	Full Time	36
ESR8	Elizabeth Brockman	ICL	25-09-2019	24-09-2022	Full Time	36
ESR9	Laura Upton	IBPS-CNRS	01-09-2019	31-08-2022	Full Time	36
ESR10	Flavio Tomasi	IBPS-CNRS	01-09-2019	31-08-2022	Full Time	36
ESR11	Ágata Silván	Lundbeck	01-09-2019	31-08-2022	Full Time	36
ESR12	Manuela Rizzi	CDBS-UEDIN	01-09-2019	31-08-2022	Full Time	36
ESR13	Alessandro Chioino	BMI-EPFL	01-09-2019	31-08-2022	Full Time	36
ESR14	Vanesa Salazar	CDBS-UEDIN	20-09-2019	19-09-2022	Full Time	36

Table 8: Researchers declaration of the selected Syn2Psy Early Stage Researchers.

4. Career development plan for each recruited researcher

Each ESR under mentoring of the PI wrote a career development plan, prepared using the EC template. The short-term goals were described including results, techniques and skills, research management, communication skills, other professional training and networking opportunities. The long-term career objectives (5 years) were also described as well as the research activities and other training needed to attain the goals.

5. PhD Training and Network schools

Additionally to activities in the local PhD programmes (see table 9 for the PhD programs in which the Syn2Psy ESRs are enrolled), the ESRs have already participated in the Syn2Psy Network School 1 (NS1) with the title '**Basic Concepts on Imaging Tools and Data Analysis**' that took place at CNC, Coimbra, between the 30th of September and the 4th of October 2019. The Syn2Psy NS1 was a one-week intensive microscopy course focused on the principles and high-end applications of quantitative fluorescence microscopy. Participants gained a theoretical understanding and hands-on experience on state-of-the-art equipment such as widefield microscopy, laser scanning and spinning disk confocal microscopy, multi-photon microscopy, deconvolution methods, and digital image processing and analysis. The NS1 was organized between Luísa Cortes (CNC – Head of Microscopy Unit MICC) and Monika Marx (Senior Manager Application Sales Specialists - Carl Zeiss Microscopy GmbH). Apart from the training provided by the application specialists from ZEISS (Syn2Psy partner), Monica Marx and Soren Prag, the training was complemented by talks from invited speakers who are either managers of microscopy facilities from research intensive institutes (IMM -José Rino, CEDOC – Telmo Pereira, Achucarro – Jorge Valero, IBILI – Monica Zuzarte) or researchers experienced in using the microscopy techniques (Joana Ferreira, Ana Luísa Carvalho, Ângela Inácio). As for evaluation, the students were evaluated on the last day of the course by writing a 20 question Exam (multiple choice and fill in sentences). To measure the overall course satisfaction, we asked the students to answer a 9 questions questionnaire.

CNC	PhD programme in Experimental Biology and Biomedicine (BEB).
IINS-CNRS	École Doctorale des Sciences de la Vie et de la Santé (The Life and Health Science Doctorate School) accredited by the Bordeaux University.
IBPS-CNRS	École Doctorale Cerveau-Cognition-Comportement (The Brain-Cognition-Behaviour Doctoral School, ED3C), co-accredited by Sorbonne Université (SU), Université Paris-Descartes, École Normale Supérieure (ENS) and École des Hautes Études en Sciences Sociales (EHESS).
ICL	ICL - Clinical Medicine Research (Clinical Sciences).
CDBS-UEDIN	Neuroscience (Biomedical Sciences - Centre for Discovery Brain Sciences)
BMI-EPFL	EPFL PhD program in Neuroscience (EDNE).
Lundbbeck	Graduate Program in Neuroscience from the Faculty of Health and Medical Sciences, University of Copenhagen.

Table 9: PhD Programs in which the Syn2Psy ESRs are enrolled.

6. Management of the action

6.1. Kick-off meeting:

The Syn2Psy kick-off meeting took place on the 26th and 27th of September 2019 at Exploratório in Coimbra with 41 participants: Early Stage Researchers, Principal Investigators representing all Beneficiaries, and representatives from partner institutions. Syn2Psy members presented themselves and were reminded of the project structure, goals, timeline and events. The project financial aspects, management structures, reporting, open access policies and ethics were also topics of discussion during this meeting. The implementation strategy and plans for future work were discussed. Work packages for research training and network activities (including the Network Schools, Secondments and personal career development plan) were also discussed. Dissemination and communication activities were brought up (Syn2Psy presence on social media, participation on promoting awareness activities and the communication to different audiences through participation of PIN and Marionet). The first meeting of the supervisory board took place during the kick-off meeting and the members of the other committees were assigned.

6.2. Internal Website:

An internal website was created as a login area of the public website (www.syn2psy.eu). Syn2Psy ESRs and PIs add their institutional email and a secure password. The website administrator (Syn2Psy project manager) sends an email to confirm the authenticity. After the confirmation, the administrator accepts the members as website subscribers. In this way, Syn2Psy members are able to see content which is not available for anyone else (H2020 documents, syn2psy confidential documents). Only Syn2Psy participants will have access to this restricted area and can add content by contacting the administrator.

6.3. Data Management Plan:

An initial data management plan (DMP) for Syn2Psy ITN included information regarding the types and formats of data collected, observed, generated or reused for the ESR projects. The DMP also included provisions for metadata documentation, information on ethical issues, data access and security, data storage and long term preservation, open access and repositories for public data sharing. The DMP was prepared taking in account the EC Open Research Data Pilot. The data generated during the Syn2Psy project is intended to follow the FAIR principles for data storage and sharing (findable, accessible, interoperable and reusable). The research carried out by the ESRs will generate data from studies on: novel animal models created to mimic specific human mutations, human-derived neurons, brain organoids and IPSCs derived from patients as models of neurodevelopmental disorders. The data will include videos of behavioural studies, super-resolution microscopy images and synaptic and mesoscopic imaging, fiber photometry data, optogenetic data and electrophysiology data, among others. The initial DMP is a living document and the content will be updated to the end of the project.

7. Communication Activities

7.1. Public Website:

A Syn2Psy public website was created (www.syn2psy.eu) containing varied information about the beneficiary institutions, ESRs, research projects, information about the meetings and network schools (agenda, topics, organisers), a page with publications and a blog for science communication and dissemination. In the Blog area, ESRs write one post per month on their experience living in another country, on their research projects or on broader topics of interest. The blog area also collects news mostly related to the researchers and the research. We will use the Blog in the coming months to also share de communication and dissemination activities of the ESRs. All new blog posts are also promoted through the Facebook page.

7.2. Social Media:

Syn2psy Facebook (https://www.facebook.com/syn2psy/) and twitter(https://twitter.com/Syn2Psy) accounts were created and are used to share the networking and communication events where the ESRs are present and other news on science and society related to the topic.

7.3. Science Outreach:

The ESRs will participate in promoting awareness for brain research during the brain awareness week and will also promote Syn2Psy to general audiences in the European researchers night.

7.4. Work with Partners:

During the kick-off meeting, the ESRs alone (without the PIs) met for the first time with representatives of Marionet and PIN and had an activity together which lasted 2-3h. Each ESR started by introducing themselves and explaining what interests them in the Syn2Psy project, and then every ESR wrote in a piece of paper in their language either 1) a favorite dish/drink, 2) a favorite music band, 3) a saying. Each paper was then chosen, read and written by PIN representatives, and the ESRs had to guess who wrote it. The goals of this activity were 1) allowing the students to learn a bit more about each other, 2) increasing the awareness for the fact that a piece of information can have different interpretations depending on who is reading it and 3) having a moment of fun together.
In the near future ESRs will start working with PIN towards writing research papers for young audiences (to be published in Frontiers of Young Minds). Groups of 3 ESRs will write a paper which will be reviewed by young reviewers from this journal. Later PIN will use this material to produce chronicles and other content to be published in public media (newspapers) and as flyers to sensitize the population for neuropsychiatric diseases. The flyers will be reviewed by patients and their families. The chronicles/articles/flyers will be in the near future translated by the ESRs in their mother tongue and in the language from the host country in an effort to disseminate this materials to different audiences.
The work with Marionet towards writing a theatre play will start in the midterm meeting when the ESRs and Mário Montenegro from Marionet will have a brainstorming activity and plan the writing of the theatre play.

8. Impact of the Action

Syn2Psy has recruited 14 ESRs who have started their contract in September 2019. They have enrolled in PhD programs at their respective host institution, and taken part in the Syn2Psy kick-off meeting as well we in the first Network school. ESRs have had the chance to meet each other and all beneficiaries and participant institutions in Syn2Psy. They have presented their project at the kick off meeting, which they are now developing at the respective host institution. In collaboration with their supervisor, ESRs have now defined concrete plans for secondments in other labs in the consortium as well as with the non-academic partners. ESRs also started interacting with PIN and Marionet, the Syn2Psy partners with a crucial role in the communication of the project activities with different target audiences.

Overalll, Syn2Psy is contributing to the training of the recruited ESRs at different levels: 1) scientifically, through their PhD programs, network schools and laboratory work; 2) in collaboration with non-academic partners, in exposing ESRs to scientifically-relevant non-academic activities; 3) in science communication and in disseminating the project results to different audiences, through the interaction with PIN and Marionet and the joint activities with these partners. The integrated training of the ESRs will have a impact on their future career; in addition, implementation of Syn2Psy positively contributes to scientific collaboration among the partners, as well as to the implementation of good practices in the institutions involved.

Annex 1 – ESRs scientific and training progress reports (January 2020)

ESR1 - Orsolya Antal, CNC

Since taking up my place as an ESR in September, I have taken part in several training opportunities and courses in preparation for and complementing our planned experiments. Ranging from the first Syn2Psy network school in October on microscopy, imaging and data analysis to being trained in some of the routine methods and facilities in our lab, I have gained and practiced skills that will be important for completing my project. Additionally, a crucial part of this period has been taking part in an Animal Experimentation course, being trained in basic methods of animal handling and designing and performing experiments. As behavioural studies form a crucial part of my project, having received this training has also allowed me to start working on collating and optimising the experimental procedures for some of the behavioural tests that I will perform.

ESR2 – Alessandro Chioino, EPFL

During the initial four months of PhD the early stage researcher actively joined to several seminars and classes, the most relevant of which are: the kick-off meeting of the syn2psy network and the network school organized by the same consortium, focused on optical microscopy obtaining 3 ECTS from it. Afterwards he also joined to the two days symposium titled “Fear learning-from neuronal circuits to translation” organized by the Echole Polytechnique Federale de Lausanne obtaining 1 ECTS from it. The candidate weekly attends the seminars organized by his institutions and the laboratory meetings.
In this first phase of the project the ESR attended also courses in order to obtain all the necessary documentation to start working with animal models, obtaining the certification for the module 1 from the Lemanic Animal Facility Network.
In the mean time the candidate started working on his PhD project, reviewing the literature to better grasp the topic and piloting initial tests such as testing brain coordinates and setting up the technique for the one-photon in vivo calcium imaging he will exploit during the project.
He also learned to perform electrophysiological recording from ex-vivo samples with whole-cell patch clamp configuration, a technique that will be part of his project.
Currently the ESR is performing electrophysiological recordings and piloting new behavioral tests.

ESR3 – Giuseppe Cammarata, CNC

My project is focused on the effects of valproic acid (VPA), an anticonvulsant drug, on the development of human brain organoids. For this study, I practiced with the human induced pluripotent stem cells (hiPSCs) to generate brain organoids. In order to observe the effects of VPA at the physiological level throughout development, I am learning whole- cell patch clamp with biocytin for further morphological reconstruction. In parallel to this project, I am planning to learn some gene editing techniques to create new hiPSC lines.
Furthermore, I attended together with my colleagues of the Syn2Psy program the Network School organized by the MICC in collaboration with Zeiss in Coimbra. There, I had the possibility to know better the other PhD students involved in this program and to share ideas with them.
Lastly, the Network School gave me the opportunity to widen my knowledge on the existing

microscopy technics and I also had an introduction to the methods currently used to analyse image data.

ESR4 – Diogo Soares, IINS-CNRS

During my first three months of training in the Syn2Psy network and in my lab I have completed various training skills related to PhD project. I have completed health and safety seminars and gained training in super resolution microscopy (STORM), cell culture of primary hippocampal neurons and immunohistochemistry techniques. I have also participated in the Syn2Psy kickoff meeting and in its first network school - Basic concepts on imaging tools and data analysis. Finally, I have completed a French animal experimentation course with the equivalence of the FELASA A + D training.

ESR5 – Marcos Sintes, ICL

I started my PhD on September 18th, 2019 and one week later I attended Network Kick-off Meeting and the first Network School in Coimbra, where I received theorical and practical training on the use of microscopy imaging techniques.
Back in the lab, I attended to the animal research training course to obtain a personal license (PIL) to perform controlled experimental procedures on animals. I was also trained on handling and humane killing mice and received the necessary inductions to get access to the Imperial College animal facility. I performed behavioural analysis of wild type using the three-chamber test and mouse optical tracking software. In order to be able to perform possible necessary modifications to the current experimental behavioural setup, I received 3-D printer and laser-cutter training.
I started to learn use of coding under MatLab to utilise the tracking software and analyse data. I was trained on techniques for the study of brain anatomy, including cryostat sectioning of perfused mouse brains, section mounting and confocal microscopy imaging.

ESR6 – Daniel Hunter, IINS-CNRS

The first network school provided extensive training in various techniques of microscopy, including practical sessions with epifluorescence, spinning disk and two-photon systems. Beyond this, we also participated in workshops focused on macro building for FIJI analysis software, deconvolution programs and dendrite reconstruction in IMARIS. Lectures provided from the Centre for Neuroscience and Cell Biology(CNC) and invited speakers (Zeiss) were beneficial from both a practical perspective: understanding the mechanics of various microscope technologies and analysis methods; and engaging with regards to the applications to our respective fields of study.
Since attending the network school I have been becoming acquainted with the common protocols in my hosting lab in Bordeaux. Initially this involved training in good practice to maintain cell cultures: both dissociated and organotypic. Under the guidance of my supervisor, I have been troubleshooting some fluorescence-immunohistochemical techniques: triple staining for surface NMDA receptors, parvalbumin and PSD-95, in order to elucidate the relative synaptic-extra synaptic distribution of NMDA receptors on both pyramidal cells and inhibitory interneurons of the hippocampus. With the expectation here being that inhibitory cells have a greater relative proportion of extra synaptic NMDA receptors, rendering a higher “vulnerability” of inhibitory hippocampal networks to

perturbation by large humanαNMDAR-autoantibodies which cannot easily access the confined space of the synaptic cleft.
Moreover, I am using organotypic cultures to practice whole-cell patch clamp electrophysiology, a technique that I have long since been keen to acquire. Similarly, here the aim is to characterize the effect of human patient-derived αNMDAR-autoantibodies on excitatory-inhibitory balance in hippocampal networks. Specifically, by comparing the frequency and amplitude of spontaneous excitatory and inhibitory postsynaptic currents and tonic current of pyramidal cells and interneurons during exposure to variable concentrations of patient auto antibodies.
Currently, while the cultures used in my work are setup by a dedicated team of technicians in the institute, the practical option will be to set these cultures myself. To that end, I am registered to undertake the necessary regulatory training courses later in the year (June/July 2020), to allow me the freedom to employ other experimental protocols in the future.
Outside of practical training and experiments, I have been afforded the opportunity to present and discuss my proposed work in our weekly lab meetings. The practice, particularly in presentation skills has been of great value and is a skill I intend to continue to develop over the coming months.

ESR7 – Elisa Corti, CNC

I arrived in Coimbra in September and since then I have been attending several lectures and training. First of all there was the kickoff meeting, in which I met the other ESRs and all the people involved in this network. This was followed by the first network school regarding the basic principles of microscopy and imaging analysis: we focused on the characteristics of the different microscopes and we learnt how to conjugate them with our needs. We had different hands-on sessions, fundamental to consolidate what we learnt in the lectures.
Then I attended a course focused on animal handling, thanks to which I got in touch for the first time with the reality of an animal facility, understanding what taking care of animals mean and gaining a basic knowledge of simple surgical procedures. Also in this case theoretical lessons were accompanied by practical ones, in which I tried to perform procedures as simple as an intraperitoneal injection on both rats and mice.
In the meantime I got familial with some laboratory practices and protocols such as dissection and isolation of primary hippocampal neurons, transfection and immunofluorescence. Moreover I got trained to the use of the cell culture room and of the microscopes we have in the MICC facility.
Taking advantage of what I have learnt, I am currently validating the *in vitro* model of Fragile X Syndrome (FXS) on which I will be working. Namely, I am using a shRNA obtained as a kind gift from another laboratory to knock down fragile mental retardation protein (FMRP) and I am evaluating whether this shRNA is working and how much FMRP levels are reduced in neurons transfected with this shRNA.
In the immediate future I will be attending a core technologies course, to be aware of all the technological platforms available at CNC, and a Portuguese course to better know the language of this country.

ESR8 – Elizabeth Brockman, ICL

During the past three months, my PhD project has progressed well. I have completed Network School 1, completed the Syn2Psy Kick-Off Meeting, obtained my UK Personal Licence for Animal Research, and have completed all necessary safety, induction, and facilities training. I have also been successfully trained on a large number of relevant techniques using both mice and cells. These techniques include Schedule 1 techniques, anaesthesia of mice, surgical preparation, immunohistochemistry, subcutaneous and intraperitoneal injections, human induced pluripotent stem cell maintenance and viral transduction, and more. I am also in the midst of being trained on critical techniques including perfusion and 2-photon imaging. Little scientific data can be presented to date, but experiments are underway. I am currently optimizing viral concentrations for transductions. Additionally, I am responsible for my first group of mice, which underwent successful craniotomies in December. They will be imaged in the coming months as the injected stem cells develop.

ESR9 – Laura Upton, IBPS-CNRS

Since starting the project, I have participated in and completed a number of training sessions and courses that are necessary to the completion of my project. In the first month, I attended the first Network School, which taught us about the use of various types of microscopes which will be useful for my project, which will rely in part on imaging data. I also attended a number of safety training courses to be able to safely use the facilities available at Sorbonne Université, and have been given a full run down of the specific safety protocols of our lab space. In November, I attended a two week training course to obtain a French certification that allows me to work with rodents in an experimental setting. Following this, I was specifically trained in the lab on how to humanely sacrifice animals and how to dissect and store their brains through freezing. I have also observed others in the lab performing a number of techniques which I will most likely need to perform for my project (for example perfusing mice with paraformaldehyde to fix tissue, performing PCRs for genotyping mice). I have been taught how to use equipment such as the cryostat safely and proficiently. I have also improved my proficiency in the analysis of fluorescent and immunohistochemistry data, both manually and using software such as Image J.

ESR10 – Flavio Tomasi, IBPS-CNRS

I started my work under the supervision of Catalina Betancur in September. During these months I have been mostly trained for the techniques I am going to use to carry out my project. At the beginning of October, in Coimbra, I attended the Kickoff meeting of the Innovative Training Network Syn2Psy and the First Network School from our consortium, about imaging tools and data analysis.
At the end of October/beginning of November I took a course for animal experimentation at the *Institut Pasteur* in Paris. Attending the Regulatory course for project designers (rodents and lagomorphs) I learned the legislative, ethical and welfare aspects of using animals for scientific purposes.
In the lab I started the breeding of my mice to obtain a colony for the experiments. Moreover, I learned how to genotype my animals and how to humanely kill a mouse to correctly remove the brain and freeze it in isopentane.
Finally, I was trained on a few techniques I will use in the following years. I learned how to use the

cryostat to properly slice frozen brains and how to perform a western blot to measure the amount of proteins in brain tissues.

ESR11 – Ágata Silván, H. Lundbeck A/S

I started as ERS in Syn2Psy network in the beginning of September 2019. Particularly, I joined the ERS11 project under the supervision of Kjartan Frisch Herrik (Lundbeck A/S), Charlotte Hougaard (Lundbeck A/S) and Kristi Anne Kohlmeier (University of Copenhagen).
Within the network, I have participated in the kick-off meeting and later Microscopy course "Basic concepts on imaging tools and data analysis" in Coimbra, Portugal, where we acquired competence in different microscopy techniques, imaging acquisition, and data analysis.
As part of my experimental work during these months in Copenhagen we have started to set the optimal conditions for patch clamping in the thalamic reticular nucleus (TRN). This brain region points out to have a strong implication in neuropsychiatric disorders and it is typically involved in sensory gating and the generation of sleep oscillatory rhythms. The experiments include brain extraction, slicing in a vibratome to obtain acute horizontal brain slices and performing whole-cell recordings in the TRN. Different protocols in voltage and current clamp have been tested to characterize cell populations and firing properties of the TRN neurons. To test the effect of CaV3 channels on the activity of these cells, we have bath-applied a CaV3 channel blocker, TTA-P2 (3µM). Further experiments will include other potential ion channels that might be pacing bursting activity in TRN cells.
As a student enrolled in the Neuroscience PhD program of Copenhagen University (KU), I have participated in the NeuroGrad Winter School, where we got the chance of critically reviewing abstracts and poster presentations from 2nd and 3rd year students, improving our scientific writing skills and discussing my project with other students and senior researchers in Neuroscience.

ESR12 – Manuela Rizzi, CDBS-UEDIN

Since the start of the project, I have been exploring the existent literature that is at the base of my research project (genetically modified animal models of Fragile X and autism related disabilities) and the major accomplishments obtained in the field that would then support the rationale of it (dysregulation of protein synthesis). This resulted in a report describing the 1st year working plan that would soon be followed by an oral presentation to the member of my thesis committee with the aim of bringing further ideas and clarifications and practice my oral presentation skills.
Regarding progresses of my project, I started to optimize the protocol of Ribosome Profiling, which will be the key approach to study dysregulation in mRNA translation in Fragile X and Syngap+/- haploinsufficiency rat models of disease. Looking in the literature (Ingolia et al., 2012) and getting help and advice from experts in the field, I am trying to develop a solid protocol to be used in my future experiments. I started to perform some preliminary steps in a pilot experiment using HEK 293 cells and I will continue with this during these following months.
I shadowed the postdocs of my team to have a glance at other different techniques that are used in the laboratory. More in detail: dissection and preparation of hippocampal cell cultures, Translating Ribosome Affinity Purification (TRAP) technology.
I also attended health and safety trainings for working in laboratory areas: COSHH, Fire Awareness Training, Introduction to Biological Safety, Occupational health and laboratory animal allergens (LAA)

exposure, Respiratory protective equipment (RPE), Tight fitting respiratory protective equipment (RPE), and the theoretical course to work with laboratory animals that will be followed in few weeks by a practical assessment to obtain my personal license.
During the first weeks of my employment I participated in the kick-off meeting in Coimbra to get to know the other students and partners involved in the Syn2Psy project and attended the first Network School in which I had a theoretical and practical outlook on principles of microscopy, imaging approaches and data analysis (fluorescence microscopy, multi-photon microscopy, dynamic imaging approaches). I also participated in the SIDB Annual Research Retreat which consisted in presentation on most recent work in the field of autism and discussion on future development and research plans.

ESR13 – Loredana Cumpana, EPFL

In the first two months, I participated in training sessions and courses that would allow me to perform experiments with animals and use EPFL`s facilities. I completed the animal experimentation module 1 (resal), the mandatory Safety training course and a supplementary FOBS3 course that allows me to access P2 labs and work with viruses. Within EPFL I also acquired access to the Microscopy facility and the Histology platform by attending the required courses. During October I participated in the first Syn2Psy Network School on Microscopy and Imaging techniques held in Coimbra and in November I also participated in Fear Symposia organized by EPFL.
I learned ex vivo patch clamp on mouse brain slices from my Co-supervisor Simone Astori. After receiving the animal experimentation license I started performing control experiments on mouse brain slices containing the Thalamic Reticular Nucleus (TRN) to assess the intrinsic passive and active properties of TRN neurons. Recently I also started patch clamp experiments to investigate the effect of CRH on TRN excitability.
To confirm Corticotropine-release Hormone Receptor 1 (CRHR1) expression in TRN, as reported in the literature, I performed Immunohistochemistry labeling on perfused mouse brain slices, using antibodies against CRHR1 but also against Parvalbumin and Somatostatin. The latter are markers for populations of TRN neurons that have been shown to have different firing properties. To test CRHR1 antibody specificity, CRHR1 conditional knock-out mice were generated by tamoxifen induced Cre recombination.
I am also establishing two transgenic mouse lines that will be important for future experiments, CRH_IRES_Cre and Ai27D. I learned to perform stereotaxic surgeries for viral delivery and tested TRN coordinates, followed by viral injection in CRH Cre mice to further adjust experimental conditions in order to map CRH projecting neurons to the TRN in the near future.

ESR14 – Vanesa Salazar, CDBS-UEDIN

I started my training by attending the Syn2Psy kick-off meeting in Coimbra and 1st network school about Imaging acquisition and analysis. I kept on improving my competences on imaging analysis by doing a course in FIJI imaging processing back in Edinburgh. I also acquired the ScotPIL licence at A+B+C levels as well as completed the handling training and Schedule 1 killing methods for both, mice and rats. I've been trained in colony management and how to use the tick@lab software for this purpose. I completed both, the animal facility and NVS induction. I've been introduced to behaviour tests and EEG/LFP recording *in vivo* and how to build 8-tetrodes megadrives. In terms of writing skills, I attended

the Data Management Plan workshop as well as the PhD Autumn School in Edinburgh. Moving to data analysis, I've initiated in Matlab programming by doing an online course offered by Matlab enterprise and funded by the University of Edinburgh. Finally, I've completed the compulsory trainings on health and safety such as the Fire Awareness training or Biosafety by The University of Edinburgh.