



Project Number:	284941	Project Title:	Human Brain Project
Document Title:	ERP first progress report		
Document Filename:	SP13_D13.4.3		
Deliverable Number:	D13.4.3		
Deliverable Type:	Report		
Work Package(s):	WP13.4		
Dissemination Level:	RE = Restricted to a group specified by the Consortium		
Planned Delivery Date:	M12/30 September 2014		
Actual Delivery Date:	M15/12 December 2014		
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Abstract:	<p>The ERPO is leading the HBP's efforts to establish collaborations with diverse relevant stakeholders that will add value to the HBP's research roadmap, and enhance the Project's overall outreach and results. Activities in Y1 focused on establishing a team, starting a dialogue with potential collaboration Partners, developing the administrative framework for the future Partnering Projects, developing processes to map technology developments in the Project as they occur, and building the Innovation and Tech Transfer Committee (ITTC). Challenges encountered were mainly due to the time it took to staff the team, develop the operational plan for implementing the DoW (to ensure alignment and high-level buy-in from HBP leadership for the plan), and develop effective collaborations with the Subprojects.</p>		
Keywords:	Collaborations, initiatives, funding, industries, international organisations, civil society, European and international research institutions, initiatives and infrastructures, technology portfolio, EU member states and regions, European Commission, innovation hub, business development scenarios		



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1. Introduction

1.1 The Human Brain Project (HBP)

The Human Brain Project (HBP) is a major international scientific research project, involving over 100 academic and corporate entities in more than 20 countries. Funded by the European Commission (EC), the ten-year, EUR 1 billion Project was launched in 2013 with the goal "to build a completely new ICT infrastructure for neuroscience, and for brain-related research in medicine and computing, catalysing a global collaborative effort to understand the human brain and its diseases and ultimately to emulate its computational capabilities."

The fields of neuroscience, medicine and information technology each have important roles to play in addressing this challenge, but the knowledge and data that each is generating have been very fragmented. The HBP is driving integration of these different contributions.

During the Ramp-Up Phase, the HBP will collect strategic data, develop theoretical frameworks, and perform technical work necessary for the development of six Information and Communication Technology (ICT) Platforms during the Operational Phase. The ICT Platforms, offering services to neuroscientists, clinical researchers and technology developers, comprise Neuroinformatics (a data repository, including brain atlases and analysing tools); Brain Simulation (building ICT models and multi-scale simulations of brains and brain components); Medical Informatics (bringing together information on brain diseases); Neuromorphic Computing (ICT that mimics the functioning of the brain); and Neurorobotics (allowing testing of brain models and simulations in virtual environments). A High Performance Computing Platform will support these Platforms.

1.2 SP13: Management - The European Research Programme Office (ERPO)

The ERPO aims to maximise the potential and impact of the HBP, by integrating European and international research efforts on the brain, neuromorphic computing and diseases of the brain; supporting alignment of regional, national, European and international initiatives with HBP goals; associating with complementary programs; facilitating the commercialisation of research outcomes and European industry engagement.

The ERPO will pursue the following plan in the Ramp-Up Phase as part of the strategy development process.

- 1) Identify relevant stakeholders in the following target groups based on defined criteria:
 - a) European and international research institutions, initiatives and infrastructures
 - b) EU member states and regions
 - c) European industry including SMEs and large industry
 - d) International organisations including IGOs
 - e) Civil society including NGOs and interest groups
 - f) Funders (FLAG-ERA, EU research funding instruments, venture capital firms, early stage funding mechanisms, philanthropy, high net-worth individuals, business incubators, etc.)
- 2) Develop and pilot partnership categories and options for each of the target groups



- 3) Develop and pilot business development scenarios for the HBP
- 4) Develop technology portfolio
- 5) Develop and test an outreach approach and supporting materials for internal and external audiences
- 6) Identify and build relationships with other relevant Departments (DGs) of the European Commission to identify other EU policies, programs and instruments that could add value to the HBP
- 7) Monitor progress, assessing outcomes and outputs, reporting, identify key lessons
- 8) Develop strategy for Operational Phase including KPIs.

The operational plan for the ERPO does not strictly follow the structure of the DoW. This is because many crosscutting activities are best outlined in one plan for the ERPO, to ensure synergies and maximise limited resources. In addition, as described in the M6 Deliverable, tasks related to governance and education are handled separately by different teams. The ERPO also acquired a new Task, T13.3.4 (Innovation: coordination of IPR and technology transfer), which needed to be considered when planning and conducting activities in Y1.

1.3 Purpose of this Document

This report details progress in the implementation of the ERP. It includes chapters describing contacts with national funding agencies and with other research programmes and initiatives, contacts with industry. It also reports on the HBP Education Programme, although its plans were not described in the ERPO M6 Deliverable D13.4.1, the Education Programme having submitted its own separate M6 Deliverable D13.4.2.

1.4 Structure of this Document

The remainder of this chapter provides an SP-level overview, highlighting the SP's main accomplishments and issues encountered in the period M1-M12. Subsequent chapters look at accomplishments and in issues within individual components of the SP, as defined in D13.4.1 HBP ERP Planning Document.

- Identification of Relevant Stakeholders
- Development and Piloting of Different Types of Partnerships
- Development and Piloting of Business Development Scenarios
- Development of Technology Portfolio
- Development and Testing of Communications Approach and Materials
- Identification of Relevant EU Departments and Policies
- Monitoring Progress and Identification of Key Lessons
- Development of an Operational Phase Strategy

The Annexes present in tabular form what the Subproject planned to achieve in this period, and what it actually achieved, including the Subproject's Scientific Key Performance Indicators (SKPIs).

The Milestones for Y1 were:

- M236: All ERP functions set up and in operation (M2)
 - Staff members have been hired gradually throughout the year. The Chief Relations Officer started in M1, the International Relations Manager started in M2, the IP and



Tech Transfer Manager started in M4, the Industry Relations Manager started in M6 and the EU coordinator will start in M15.

- M238: Contacts established with all institutions and projects interested in ERP (M6-30)
 - The ERPO started establishing contacts on collaboration with relevant institutions and projects early in Y1.

1.5 Overview of ERPO Achievements

A main focus during Y1 has been to build the ERPO team and to define its priorities and working processes. We have established a comprehensive mechanism for monitoring progress in the identification of stakeholders, including the development of an action plan for the Ramp-Up Phase with Milestones, weekly team reviews, monthly progress updates and quarterly reporting. Monitoring and quality control activities are covered in Chapter 8 of this report.

We have started or maintained a dialogue with potential European and international collaboration partners; initiated relations with some EU Member States and Regions; begun identifying possible future industry partners, as well as networks focusing on innovation and industry; initiated contact with intergovernmental organisations; developed a close working relationship with FLAG-ERA and developed the administrative framework of the Partnering Projects; put in place processes to map technology developments; established the HBP's Innovation and Tech Transfer Committee (ITTC) and done research to understand the funding landscape of Europe

Collaboration and exchange with Graphene in common flagship areas, such as the development of the Partnering Projects approach, has also been established.

1.5.1 Lessons learned

Several lessons have been learned in Y1, mainly in terms of identifying relevant stakeholders (section 2 of this report), as this is the main focus of the ERPO efforts at the moment. Lessons include:

- The project teams have undergone a period of settling in in Y1 with new people joining, new teams being formed, collaborations between teams being established, and the scope of work being tackled. In this context, the possibility of establishing meaningful and concrete collaborations so quickly with external stakeholders was overestimated.
- The Commission's expectations regarding the progress of the ERPO team in mapping and developing collaborations with diverse entities in Europe (research, civil society, industrial) take into account several important factors including:
 - The time required to build the ERPO team (staff has been hired and joined gradually in Y1)
 - Human and financial resource limitations of the team. The ERPO is a small unit of currently four individuals with a very small discretionary budget.
- Before meaningful collaborations with the HBP can be built, particularly with industries, the concrete outputs of the project must be clearer, e.g. technologies.
- The identification of potential industry Partners is a complex process that considers the objectives, but also the tangible outputs of the HBP in terms of the Platform development process, the creation of commercially exploitable technologies, the needs of large industry, the needs of small and medium size enterprises, and opportunities for start-ups.



- It will take time for the HBP to produce technologies that can be patented or further developed in cooperation with industrial partners.
- Outreach/communications activities both internally and externally will be an important component of the ERPO's efforts going forward. No budget was foreseen for this as part of the ERPO's budget.

1.6 Changes to ERPO objectives, structure & personnel

The ERPO faced several staffing challenges in Y1, which have handicapped its operations.

The staffing of the EU coordinator role took much longer than planned. Initial attempts to have the position based in Brussels failed. Subsequently, the position evolved into a more junior role to be based in Switzerland, and the candidate will start in January 2015. This has meant that the EU coordinator activities have been shared among the existing team members, including development of close collaboration with FLAG-ERA and national funding agencies.

The ERPO was also obliged to help compensate for the shortcomings of the IP and Technology Transfer manager (T13.3.4) – see Section 1.7 below. The contract of this manager has not been renewed and a replacement will be recruited in the course of 2015. In the meanwhile, the ERPO's Industry Manager has had to cover the IP & TT function in addition to her regular duties.

In addition, the ERPO's International Relations Manager took on an additional demanding new role as Acting Chief Operations Officer (COO) of the HBP, a position which he will fill for at least the duration of the Mediation Process directed by Prof. Wolfgang Marquardt of Forschungszentrum Jülich. This position will have to be replaced in order to dedicate sufficient attention to international collaborations.

1.7 Overview of ERPO problems

A main challenge is in the area of building collaborations with external stakeholders. Hurdles encountered in Y1 are:

- Each of the HBP Partners has many on-going bilateral relationships with other institutes and participates in diverse networks. The ERPO began to gather and consolidate information about these collaborations in Y1, rather than starting exclusively to develop its own links outside the Project. A key challenge is how to access the HBP Partners in the most efficient way that adds value, illustrates the benefits of sharing this information, and doesn't distract people from their scientific work. This has been a challenge, as the Project lacks a coordinated internal communications structure.
- It is difficult for the HBP to enter into partnerships, because the HBP is not a legal entity. According to the Consortium Agreement, all HBP Partners must approve any agreement with an external actor.
- The goals and value proposition of partnerships with the HBP remain rather difficult to define at this stage, simply because the Project is still within its first year. This will become clearer over the course of the Ramp-Up Phase, as work in the Subprojects advances and actual (vs. intended) outputs and developments become clearer.
- Several new, unplanned tasks were given to the ERPO in the early phase of the Project that have required extensive and spontaneous use of staff time including data gathering and identifying country contacts.
- Relations within the Project consortia and with key external stakeholders such as member state governments and national funding agencies need to be continuously



nurtured and interlinked. Information exchange and cross-disciplinary work are essential. Priorities change from country to country, and even within countries and organisations. All of this must be taken into account for effective strategy implementation.

While the IP and Technology Transfer function (T13.3.4) is not formally part of the ERPO (WP13.4), in practice, its activities are so intimately linked with the Innovation/Industry Partnerships (T13.4.4) activities that close collaboration between the two is essential. Unfortunately, the person hired for the IP and Technology Transfer function proved incapable of delivering the expected outputs, falling short in timeliness, quality and volume. In particular, this function's M6 Deliverable (D13.3.3 – Plan for use of Results) and contribution to the HBP's FPA Proposal were unsatisfactory. Working to redress this situation has placed an additional burden on ERPO personnel, which will not be fully relieved until a new IP & TT manager can be hired in 2015 (see Section 1.6 above)

In the ERPO's M6 Deliverable D13.4.1), we mentioned our ambition to move quickly to set up a first innovation (technology transfer) hub. While this conforms to the HBP's long-term goals, the aggressive timetable for this particular move was influenced by the need to counter the political fallout from the Swiss referendum on immigration (9 Feb 2014). Since then, contacts have been made to prepare the ground for a pilot innovation hub in Croatia. These contacts have helped to clarify that the timeframe for getting a facility of this sort to an operational state will be significantly longer than originally foreseen (see Section 4.2.1 below), due to a range of factors, including the lead time for development of HBP technologies and a lack of specialist resources.

The development of new technologies and mapping of background and foreground IP is a time-consuming process, and the ERPO lacks sufficient human resources to expedite the process. Trustful relations need to be built with the technology transfer offices (TTOs); this is an activity in process. Next steps in terms of bringing them together and discussing concrete cooperation opportunities will begin in Y2. As noted in 1.7.3, the development of new "HBP" technologies is not likely to take place soon.

1.8 The Next Six Months for the ERPO

The next six months are important for the ERPO as the team moves into developing pilots and value propositions for collaborations with different stakeholder groups. A major problem may be not obtaining the timely input and feedback from HBP scientists. For this reason, the ERPO will increase work with the Board regarding collaborations.



2. Identification of Relevant Stakeholders

2.1 Identification of Relevant Stakeholders: Overall Goals

The ERPO's process for identifying stakeholders, Partners and relevant networks/programs included:

- Discussions with HBP Partners
- Working through existing networks
- Conference and event participation
- Internet research
- Tracking European and global trends through internet and literature research
- Following leads, responding to requests.

2.2 Identification of Relevant Stakeholders: Main Achievements

Activities to identify relevant stakeholders within each of these groups were undertaken. The ERPO has identified five main stakeholder groups relevant to explore cooperation possibilities with the HBP. These groups include European and international research institutions, initiatives and infrastructures. The ERPO worked with HBP scientific leaders to identify relevant European and international research institutions, initiatives and infrastructures for potential collaboration. To date, the following groups have been contacted:

- PRACE (High Performance Computing)
- CERN (for the big data handling and governance questions)
- IMI (Innovative Medicines Initiative, www.imi.europa.eu)
- Biomedbridges
- Elixir
- ESFRI
- The US BRAIN Initiative
- Cold Spring Harbor Laboratory
- GeneNetwork
- ICON
- Allen Institute

Other entities contacted include the Society for Neuroscience, Federation of European Neuroscience Societies.

The ERPO team has initiated research efforts to understand the landscape of funding agencies in six European countries including Germany, France, the UK, Portugal, Sweden and Israel and plans to continue this work as soon as a new staff member is hired (EU Coordinator). The ERPO has further supported the HBP scientists in efforts to build collaborations with research efforts internationally including in China, the US, Australia, and Japan. A dialogue with all of these initiatives has been established, and all participated in the 2014 HBP Summit, held in Heidelberg 29 Sept - 1 October.

2.2.1 EU member states and regions

Diverse efforts were initiated to build relations with EU member states and regions. In the stated reporting period, visits were made to Germany, Spain, Portugal and Italy, for



example, the HBP met with Partners in Germany and participated in a political dialogue with parliament (Bundestag). In Spain, the HBP established contacts with MINECO. In Italy, the HBP contacted the Italian ministry of science. In Portugal, the HBP contacted the funding agency and government representatives. In France, close contact was maintained with ANR and CNRS. In Croatia, ministerial and science contacts have been established.

2.2.2 European industry including SMEs and large industry

Activities to identify potential future industry sector Partners consisted of developing a database of information of industries that have already contacted the HBP, and Internet research. The ERPO defined the questionnaire to map the technologies, ideas, software etc emerging within the HBP labs (HBP Technology Portfolio). This mapping effort will give a clearer indication regarding the priority industries to approach.

In particular, contacts have been made with:

- EPFL's Innovation and Valorisation Department
- EUREKA (an intergovernmental network to support market-oriented R&D)
- EEN - Enterprise Europe Network
- Technology Transfer Offices (TTO) of HBP beneficiaries
- Institute for Advanced Medicine (IMI)
- Geneva Pharma Network
- Assembly of European regions
- Smart Specialisation Strategy

2.2.3 International organisations including IGOs

The team initiated a mapping process to identify relevant International organisations. Initial research has identified several groups including the World Intellectual Property Organization (WIPO) and the World Health Organization (WHO). Meetings have taken place with WIPO, the United Nations (UN), and with the WHO in cooperation with the HBP Governance Office.

2.2.4 Civil society including NGOs and interest groups

The ERPO has established a working relationship with SP12 to explore synergies regarding civil society groups including NGOs and interest groups. Both tasks have an external focus, to facilitate or to understand the HBP's impact on society. SP12 can provide the ERPO with information on future scenarios, which can help the ERPO identify future industry partners. The ERPO can provide SP12 with information on lessons learned to help them make better projections and on the stakeholders identified, as these could also be surveyed as part of SP12. The ERPO has also facilitated the participation of a representative of SP12 in a workshop that was hosted by EPFL in October as part of the European project on Responsible Research and Innovation (RRI). The workshop may lead to a broader collaboration between HBP and the RRI project in Europe.

2.2.5 Funders (FLAG-ERA, EU research funding instruments, venture capital firms, early stage funding mechanisms, philanthropy, high net-worth individuals, business incubators etc.)

An excellent relationship has been built with the FLAG-ERA. Via this mechanism the ERPO is in regular contact with national funding agencies. In addition, we identified some key funding agencies in Europe that are important for the HBP.



2.2.6 European programmes and networks focusing on issues such as innovation, the digital agenda and industry

Activities were undertaken to identify European programmes and networks during the reporting period, including internet research, conference participation, and discussions with HBP Partners. Contact has been made with the EUREKA, European Enterprise Network (EEN). We are waiting for our EU coordinator to be hired in order to further progress this activity.

Discussions with SP12 have taken place to identify areas for potential cooperation between SP12 and the work of the ERPO. For example, in SP12 and in WP13.4, diverse surveys will be conducted that focus on the emerging technologies and involve the SP managers and leaders. Both tasks have an external focus, to facilitate or to understand the HBP's impact on society. SP12 can provide the ERPO with information on future scenarios, which can help the ERPO identify future industry Partners. The ERPO can provide SP12 with information on lessons learned to help them make better projections and on the stakeholders identified, as these could also be surveyed as part of SP12. The ERPO has also facilitated the participation of a representative of SP12 in a workshop that was hosted by EPFL in October as part of the European project on Responsible Research and Innovation (RRI). The workshop may lead to a broader collaboration between HBP and the RRI project in Europe.

Discussions with Graphene regarding approaches to developing the Partnering Projects and other Flagship-related processes were held. Finally, the ERPO has established a comprehensive mechanism for monitoring progress in the identification of stakeholders, including the development of an action plan for the Ramp-Up Phase with Milestones, weekly team reviews, monthly progress updates and quarterly reporting.

2.2.7 Lessons learned

The first year of operation has been rich with valuable lessons. The challenges faced by the ERPO can be viewed as part of a natural maturing process within the Ramp-Up Phase of this Project. A key task of the ERPO in the first year has been identifying relevant stakeholders for potential partnership/cooperation. Challenges faced include:

- Leveraging knowledge from the HBP Partner institutes about their on-going bilateral cooperation in order to create a “map” of the HBP network. A challenge is how to access the HBP Partners in the most efficient way that adds value, illustrates the benefits of sharing this information and doesn't distract people from their scientific work. This has been a challenge as the Project lacks a coordinated internal communications structure.
- It is difficult for HBP to enter into partnerships because HBP is not a legal entity. According to the Consortium Agreement, all HBP Partners must approve agreements with external actors.
- There is a lack of immediate clarity about the goals and value proposition of partnerships with the HBP because the Project is still within its first year. This will become clearer within the course of the Ramp-Up Phase as work in the Subprojects advances and actual (vs. intended) outputs and developments become clearer.
- Several new and unplanned tasks were given to the ERPO in the early phase of the Project that have required extensive and spontaneous use of staff time including data gathering and identifying country contacts. This has absorbed the team for lengthy periods of time.
- Relations within the Project consortia and with key external stakeholders such as member state governments and national funding agencies need to be continuously nurtured and interlinked. Information exchange and cross-disciplinary work are



essential. Priorities change from country to country and even within countries and organisations, all of this must be taken into account for an effective strategy implementation.

- The Commission's expectations regarding the progress of the ERPO team in mapping and developing collaborations with diverse entities in Europe (research, civil society, industrial) do not sufficiently consider several important factors including
 - The time required to build the ERPO team (staff has been hired and joined gradually in Y1)
 - Human and financial resource limitations of the team. The ERPO is a small unit of currently four individuals with a very small discretionary budget.
- Before meaningful collaborations with the HBP can be built, the Subprojects teams must settle in, collaborations among the SPs must form, and concrete outputs of the Project must be clearer, e.g. technologies.
- The identification of potential industry Partners is a complex process that considers the objectives and tangible outputs of the HBP, the needs of large industry, the needs of small and medium size enterprises, and opportunities for start-ups.

Opportunities generated by the above challenges include closer cooperation with the HBP scientists and Partners to map existing stakeholder networks. This may lead to establishing an internal advisory board to the ERPO for all external-facing issues.

More specific challenges per stakeholder group include the following:

European and international research institutions, initiatives and infrastructures: The US Brain initiative keeps evolving, and the lack of a single point of contact makes cooperation more complicated. After initial very positive results, the cancellation of a planned workshop on the side of the US will delay the coordination somewhat. However, the dialogue is continuing and expected to be deepened once the US initiative has matured beyond announcements and the first calls, including a mid- to long-term funding perspective. In addition, it should be recognised that HBP Partners have extensive networks within the stakeholder group that the ERPO should leverage, rather than building new ones. Finally, there is a need to find a convenient and effective way to gather this information from the Partners.

EU member states and regions: Priorities and challenges are very different among countries and among stakeholders within countries (ministries, funding agencies, industry representatives). Understanding the political context is very important for effective stakeholder management and relations. Levels of available and prospective funding also vary and influence decision-making on every level. We have also learned there is disjointed information flow among key actors such as the EC, member states, and the representative offices of the member states in Brussels. This has led to lack of understanding about HBP funding received by the member states, posing challenges to future funding opportunities for the HBP from national funding organisations. This realisation led to the recognition that we need to have a better understanding about decision-makers at diverse levels, ministries and governments. Finally, as a part of approaching the national funding institutes, it is crucial to have a thorough understanding of current and planned research priorities and investments in member states. This information is not easily available.

European industry, including SMEs and large industry: Diverse strategies are required to identify potential future industry Partners. For example, 99% of companies in Europe are SMEs, employing more than 67% of Europe's workforces. There are more than 200 million highly diverse SME's in Europe. The number of relevant large industries is smaller and potential Partners may be easier to identify. Strategies need to be developed to draw large industries to the HBP in a "community" and maintain the relationships while the scientific work of the Project progresses. In terms of start-ups, the main challenge will be



building open relationships with HBP scientists and ensuring regular and fluid communications and dialogue regarding new ideas and the development of technologies while at the same time inspiring entrepreneurship in a way that adds value to scientific efforts. Finally, several HBP Partners have on-going relations with diverse industries. Not all Partners are willing to share information about these contacts.

International organisations, including IGOs: Challenges have been identifying the right people within these organisations and balancing developing relations with IGOs with other activities. It is felt that IGOs are not a first level priority for HBP and that it will be easier to develop these networks when the HBP moves to Geneva.

Civil society, including NGOs and interest groups: Europe is home to diverse civil society groups focusing on issues that could be relevant to the HBP including patient rights. Deciding which groups to engage with has been a challenge. HBP will seek to identify the most relevant groups in a first step through discussions with our Partners. This has not been deemed a first level priority.

Funders (FLAG-ERA, EU research funding instruments, Venture Capital Firms, Early Stage funding mechanisms, philanthropy, HNW individuals, business incubators etc.): For the collaboration with FLAG-ERA we note that there is considerable bureaucracy within the Consortium and while the collaboration with the liaison group works extremely well, and the Consortium seems to be led well, the plurality of positions and local procedures lengthen decision times considerably. VC contacts are in an exploratory phase, so not much can be said about this segment at this time.

European programmes and networks: This activity is waiting for the EU coordinator to come on board. Some programmes and networks have been identified such as EUREKA, EEN and IMI and contacts have been made. However this is an extensive piece of work requiring a dedicated person.

2.3 Identification of Relevant Stakeholders: The Next Six Months

The main Milestones in the reporting period include the development of an HBP external stakeholder database, and a website on partnering with the HBP linked to the HBP Collaboration Portal. These Milestones are both due by December 2014. Both should be achieved. We initiated work to develop plans for a database of stakeholders contacted, or who have contacted HBP to express interest in the Project.

International relations:

- Further develop relationship with US (Government, Congress, Institutions)
- Work with EC on initiating network of international brain initiatives
- Visit more HBP Partner countries (government, NFROs, national stakeholders organisations)
- Start developing relations with Israel, Asian countries.

The major challenge the WP faces in communicating with external stakeholders arises from the recent environment of instability resulting from the open letter. At the same time, this situation provides an opportunity to be more proactive about how the ERPO manages relationships and reinforces the importance of having a proper management group that agrees on priorities, steps and roles in interfacing with HBP Partners and external stakeholders. The ERPO will seek to set up an informal internal advisory group consisting of the section heads to discuss and explore closer cooperation on all outreach efforts, including with HBP Partners and external stakeholders.



3. Development and Piloting of Different Types of Partnerships

3.1 Development and Piloting of Different Types of Partnerships: Overall Goals

The ERPO will identify stakeholder target groups, from which potential Partners will then be selected. Three different types of Partner are envisaged in the Operational Phase: HBP Core Project Participants, HBP Partnering Project Participants, and HBP Collaborating Participants.

3.2 Development and Piloting of Different Types of Partnerships: Main Achievements

The process for the Partnering Projects is being finalised and approved.

Relationships with the German, Swiss, and French governments are good and being maintained and expanded. The relationship with Israel is being started currently and Asian connections (China, Korea, Hong Kong, Singapore) are being explored and made coherent.

The relationship with the EC was built and, through regular communication, is now strong trustful and interactive. US relations are being built on the BRAIN initiative on the level of scientific exchange primarily, but the HBP also maintains relationships with the relevant stakeholders in the US Government and with organisations such as AAAS. Relations with the Fattah Brain Initiative (Led by Rep Fattah D-PA) are fruitful.

A highly interactive relationship has been built with Flag ERA, including the work towards a Joint Transnational Call to be launched this October. A liaison group between HBP and Flag ERA has phone conferences monthly and physical meetings occur during the FLAG ERA meetings, the next one will be held in conjunction with the HBP Summit in September

The ERPO actively supported the CSA process, which was very work intensive, and highly interactive. The European Commission retained the TAIPI proposal. We will build on the relationships formed with the Consortium members for both proposals in the process.

Relationships with governments and funding agencies in SPAIN, Portugal, Croatia, France have been built, as well as with Graphene. The ERPO has supported process with the Chinese (CASIA and Wuhan University) together with EPFL services.

In terms of industry, the HBP has reached out to the following groups to date to explore possibilities for cooperation:

- EPFL innovation and valorisation to ensure we are aligned with our host institution
- EUREKA (an intergovernmental network launched in 1985, to support market-oriented R&D and innovation projects by industry, research centres and universities across all technological sectors).
- EEN - Enterprise Europe Network - The Enterprise Europe Network was launched in February 2008 by the Commission's Directorate-General for Enterprise and Industry.
- TTOs of HBP Partner institutes - we have started contacting the TTO (Technology Transfer Offices) of the HBP's Partner institutes to initiate a dialogue on cooperation on issues of tech transfer and intellectual property.
- IMI - Institute for Advanced Medicine, Brussels
- Geneva Pharma Network



- Assembly of European regions - to explore possible synergies with regional innovation strategies
- Smart Specialisation Strategy - to develop an understanding of regions specialising in technologies and with human resource capacities related to the HBP

3.2.1 Lessons learned

A main lesson learned is that HBP Partners and researchers have numerous existing operational relationships with stakeholders in European research institutes, international research institutes, and research infrastructures as well as industry. HBP can gather information about these relationships, including which organisations are involved, the nature of the relationships, and what kind of agreements are in place between the HBP Partners and the organisations. This will be an important step in understanding how HBP can add value. This approach will also build synergies with existing relationships, rather than create parallel and potentially confusing relationships.

3.3 Development and Piloting of Different Types of Partnerships: The Next Six Months

At this stage, it is too early to comment as we are still in a process of collecting and assessing information on relevant stakeholders.

The biggest challenge will be for the ERPO to identify the added value of cooperation to each stakeholder group. This is a step-by-step process that will be refined during the Ramp-Up Phase.

These efforts will feed into the development of tailored value propositions for each of our target stakeholder groups, and help us design models for cooperation that benefit all participants.



4. Development and Piloting of Business Development Scenarios

4.1 Development and Piloting of Business Development Scenarios: Overall Goals

In Y1, concrete activities in the area of business development did not take place. It is foreseen that business development models will be designed and piloted to the degree possible starting in Y2. Goals of the business development efforts are to bring in funding to the HBP to enhance the scope and depth of activities and to build a funding model that will sustain and expand the HBP after the Flagship funding ends.

4.2 Development and Piloting of Business Development Scenarios: Main Achievements

4.2.1 *Innovation hub, Croatia*

We are actively exploring the possibility of an innovation hub in Croatia together with a “teaming” Consortium but this will take some time as well. First contacts in Y1 were encouraging, but there are clearly challenges.

4.2.2 *Industry Day, Spain*

The ERPO participated in an HBP-Industry Day organised by Spain's Ministerio de Economía y Competitividad (Ministry of Economy and Competitiveness) that brought together representatives of the Ministry, HBP Partners in Spain, and representatives of diverse industries in Spain. The main objective of the meeting was to explore the interest of Spanish industry to engage with the HBP as a pre-competitive platform and to discuss possibilities for engagement, such as a Spanish industry group modelled on the European technology platforms. Industry representatives present expressed an interest in proceeding with establishing an HBP industry group and exploring possibilities in the future to establish hubs in Spain related to HBP technologies. The invitation to the industry day in Spain was the result of collaboration with HBP Partners in Spain.

4.2.3 *Lessons learned*

Some lessons have emerged from our initial discussions with Croatia to explore the possibility of setting up an innovation hub in Croatia:

- It is critical to have the complete support of a local institution or organisation
- The political backup for the process has to be secured
- The funding question is critical, and needs to be addressed from the beginning
- Ideally a larger framework has to be found to position the hub (in this case we are trying to work with the H2020 Teaming effort)
- Careful development of contacts and maintenance are important.

As the ERPO has collected information for the Technology Portfolio, it has become clear that the development of new technologies is likely to be farther in the future. Business development scenarios for new HBP technologies will come at a later stage in the Project. As develop the Platforms, incremental IP may also develop. IP is central to the development of innovation hubs, and therefore, this opportunity may take time to develop. The main challenge with developing business development scenarios to the time



it is taking for new technologies to develop as part of the HBP. As described in section 5 on the Development of a Technology Portfolio, a process is now being put in place to track the development of ideas and technologies. This will take time. The first factsheet is planned for the end of Q1 2015.

Thus, a shift is being made to developing a business development scenario that first focuses on the platforms. The scenarios and supporting tools are needed anyway to permit Partners and others to use the platforms. These issues are largely out of our control. We will need to wait and see how the process progresses over the next six months.

4.3 Development and Piloting of Business Development Scenarios: The Next Six Months

The work with our Croatian Partners will continue in the next reporting period. It is too early to make clear predictions, as this is a multi-actor environment. The development of a costing model for the Platforms will be initiated in the next reporting period. This will be a collaborative effort that brings together the heads of the six platforms and others relevant to this process.



5. Development of a Technology Portfolio

5.1 Development of a Technology Portfolio: Overall Goals

The ERPO will begin mapping the HBP innovation and technology. The information will be used to:

- Prioritise Partner identification activities. For example, in areas where progress is being made most quickly and outcomes are most apparent, Partners will be sought first.
- Inform discussions with potential Partners about needs and opportunities for cooperation, including commercialisation and use of the HBP Platforms.
- Update the website with information regarding partnering with the HBP.
- Prepare a comprehensive portfolio of technologies, IP and commercially relevant innovations, as described in Deliverable 13.3.3 “Intellectual Property and Technology Transfer: Plan for use of Results.”

5.2 Development of a Technology Portfolio: Main Achievements

In the reporting period, a general concept and survey questions for the portfolio were drafted and tested with 10 members of the HBP team representing Subproject leaders, Subproject managers, Subproject coordinators and PhD and postdocs. The concept was also shared with the ITTC for comments. Based on the feedback received, adjustments were made to the concept and to the questions. The concept will be shared with the HBP Consortium in the form of a poster presentation during the 2014 HBP Summit.

Progress is also being made in discussions with the TTOs about collaboration as part of the ITTC. To date all TTOs contacted have been supportive and willing to share information on background IP, patents, software, prototypes, industry collaborations and expertise. The feedback received from the HBP Partners was used to further refine the technology portfolio concept and questions. An action plan for developing, implementing and monitoring as well as communicating about the technology portfolio was developed to “control” the implementation process. To date, activities are on time.

5.2.1 Lessons learned

Members of the HBP team are keen to contribute to the development of new concepts and processes and have important experience to share. Feedback received has improved the concept and the questions enormously. This lesson could be taken into consideration in the development of new concepts and processes for HBP. A main challenge is the scope of the work involved, as the number of ERPO staff involved in this task is very small.

5.3 Development of a Technology Portfolio: The Next Six Months

The main focus over the next six months will be the development of the first quarterly factsheet and increasing collaboration with the TTOs and ITTC.

The major activities in M13-18 include:

- 1) Finalising the technology portfolio concept and survey questions
- 2) Finalising an internal and external communications plan for the portfolio
- 3) Rolling out the technology portfolio, meaning beginning to collect information.



The main challenge faced is human resources. The development and maintenance of the technology portfolio and relations with the TTOs as part of the ITTC are extensive tasks. While these are key activities, they are not the only efforts being pursued by the Industry Relations Manager and IP and Tech Transfer Manager.



6. Development and Testing of Communications Approaches and Materials

6.1 Development and Testing of Communications Approaches and Materials: Overall Goals

The ERPO will develop an outreach plan for the Ramp-Up Phase. This plan will focus primarily on the various types of external stakeholders that comprise the ERPO's target audience. It will build our understanding of their needs and concerns while informing them about the needs and concerns of the HBP. Simultaneously, the ERPO will also inform the HBP Consortium about its work. At the end of the Ramp-Up Phase, the ERPO will refine its outreach strategy for the Operational Phase, based on lessons learnt in the Ramp-Up Phase. In preparing and executing its outreach activities, the ERPO will coordinate closely with the HBP Communications Team.

6.2 Development and Testing of Communications Approaches and Materials: Main Achievements

We have initiated a dialogue with the HBP Communications Office about collaboration on this activity as well as with the team developing and maintaining the HBP website.

6.2.1 *Lessons learned*

The communications approach can be developed after we have a clearer understanding of actual progress in the HBP Subprojects, feedback from the HBP scientists about opportunities for collaboration and a clearer understanding of the needs and interests of our key stakeholders in cooperating with the HBP. The question of "value-add" both ways (e.g. how collaboration with HBP can add value to the different target groups and how the target groups can add value to the HBP) needs further clarification. A main challenge is that the ERPO does not have a dedicated budget for the development of the communications approach and is dependent on good cooperation with the communications team for the production of materials and financing of events.

6.3 Development and Testing of Communications Approaches and Materials: The Next Six Months

The next six months are an important phase in the development of the communications approach and materials. By the end of Y1, a plan will be developed and approved for internal and external communications about the activities of the ERPO and the production of materials (starting with web) will begin. The major challenge is securing the attention of the HBP scientific team to the work of the ERPO. For this reason the ERPO is considering establishing a small internal advisory group.



7. Identification of Relevant EU Departments and Policies

7.1 Identification of Relevant EU Departments and Policies: Overall Goals

The ERPO will identify and build relations with relevant Departments of the European Commission such as DG Research and Innovation, DG Enterprise and Industry, DG Regional Policy, DG Education and Culture, DG Joint Research Centre, DG Connect in order to ensure alignment with EU policies and identify possibilities for cooperation with other programmatic areas of the Europe 2020 strategy, which may be relevant for the HBP. Relevant areas that have been identified to-date include: A digital agenda for Europe, an industrial policy for the globalisation area, and an agenda for new skills and jobs. This activity will help to promote the HBP within other EC Departments.

7.2 Identification of Relevant EU Departments and Policies: Main Achievements

The EU coordinator, who has not been hired yet, will lead this activity. The hiring process is underway, and this post will be filled at the end of 2014.

The Project has made contact with some relevant programmes including DG Research & Innovation, DG Enterprise, DG Connect. A main challenge is the time it has taken to fill the role of the EU coordinator.

7.3 Identification of Relevant EU Departments and Policies: The Next Six Months

The individual will begin in January 2015.



8. Monitoring of Progress and Identification of Key Lessons

8.1 Monitoring of Progress and Identification of Key Lessons: Overall Goals

The main goal of this activity is to have an operational plan for managing implementation of the activities of the ERPO. An action plan was developed in Y1 for each of the eight activity areas in this report. The action plans include objectives, actions, KPIs, Milestones, individual responsible, resource needs, and a timeline. The ERPO will continue to follow the action plan for monitoring and identifying lessons learned. This includes weekly team meetings, monthly reports, quarterly feedback on lessons learned, quarterly reports and annual reports

It is crucial that during the Ramp-Up Phase, ample time is spent identifying lessons learned so that success, difficulties and risks can be identified early and decisions taken regarding the approaches to take that will likely be most fruitful. In this way, the ERPO will increase its chances of achieving the stated objectives for the Ramp-Up Phase and enter with Operational Phase with tested approaches that can be scaled up.



9. Development of an Operational Phase Strategy

9.1 Development of an Operational Phase Strategy: Overall Goals

The process for developing the strategy for the Operational Phase will be open and inclusive. Input will be drawn from the HBP Management Team, European Commission, HBP Executive Committee, external Partners, lessons from the pilots, and others to be identified. A plan will be created for drafting the strategy. This activity will begin in 2015. There is no progress to be reported at this time.



Annex A: Milestones

No.	Milestone Name	WP	Month Due	Month Achieved	See Page
M236	All ERP functions set up and in operation.	13.4	2	12	
M238	Contacts established with all institutions and projects interested in ERP.	13.4	6-30		



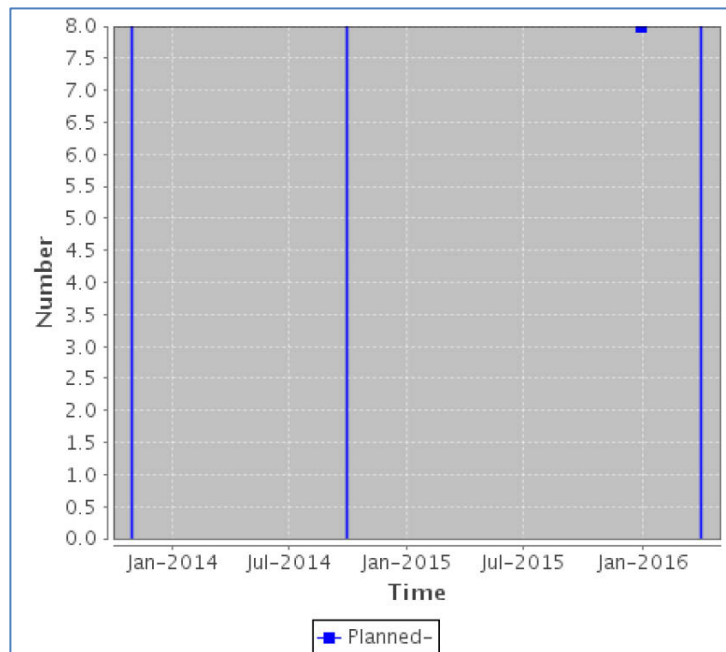
Annex B: Scientific Key Performance Indicators (SKPIs)

SP13's KPI information can be viewed at the following link on the Science and Technology Office's (STO's) KPI website:

<https://flagship.kip.uni-heidelberg.de/jss/CollectKPI?ul=268&s=UJuR3AgTezrb&um=sPO&oSP=13>

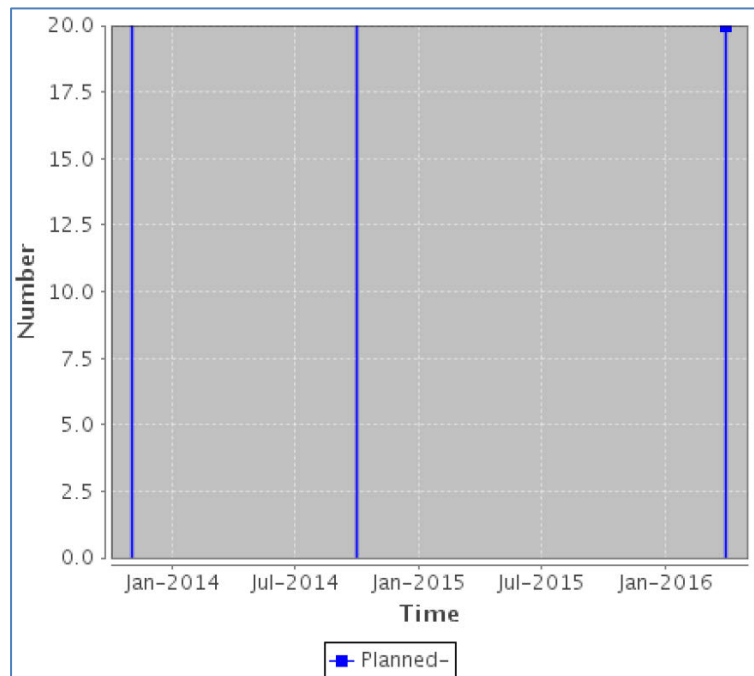
SP13.4_SKPI-20 Action plans produced (8)

- Responsible: annika.hjelm@epfl.ch



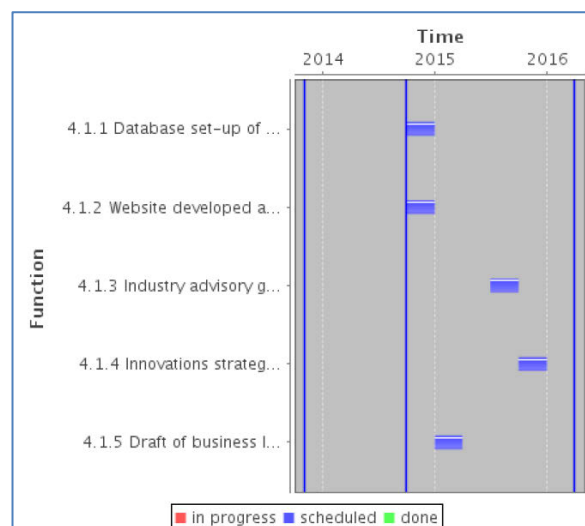
SP13.4_SKPI-21 Monthly progress overviews

- Responsible: annika.hjelm@epfl.ch



SP13.4_SKPI-13 Identification of relevant stakeholders

- Responsible: annika.hjelm@epfl.ch
- 4.1.1 Database set-up of HBP external stakeholders. Planned: 2014/09/30 - 2014/12/31
- 4.1.2 Website developed as part of HBP website. Planned: 2014/09/30 - 2014/12/31
- 4.1.3 Industry advisory group established. Planned: 2015/06/30 - 2015/09/30
- 4.1.4 Innovations strategy developed. Planned: 2015/09/30 - 2015/12/31
- 4.1.5 Draft of business landscape. Planned: 2014/12/31 - 2015/03/31

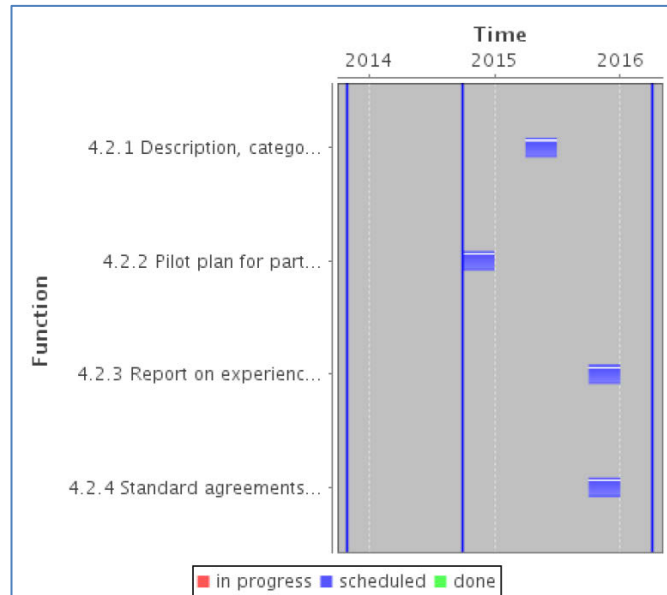


SP13.4_SKPI-14 Development and piloting of different types of partnerships

- Responsible: annika.hjelm@epfl.ch
- 4.2.1 Description, categories, options developed and documents approved. Planned: 2015/03/31 - 2015/06/30

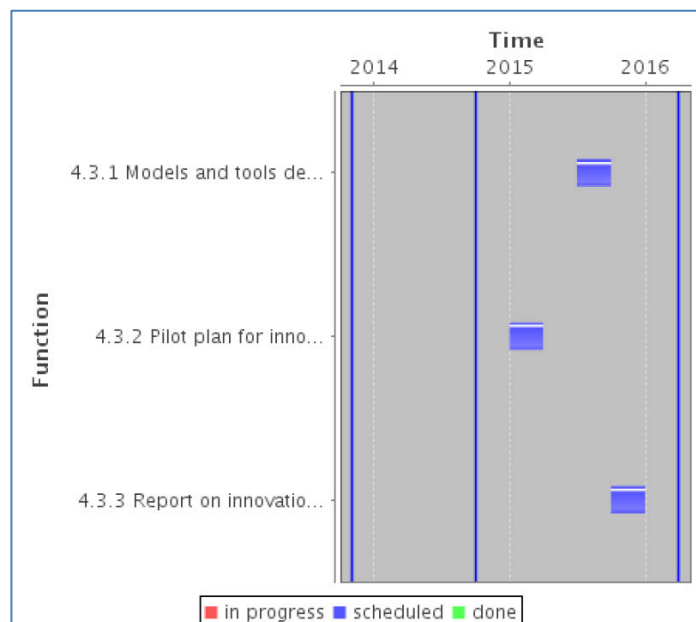


- 4.2.2 Pilot plan for partnership prepared and approved. Planned: 2014/09/30 - 2014/12/31
- 4.2.3 Report on experience from pilot prepared. Planned: 2015/09/30 - 2015/12/31
- 4.2.4 Standard agreements prepared. Planned: 2015/09/30 - 2015/12/31



9.1.1 SP13.4_SKPI-15 Business development models

- Responsible: annika.hjelm@epfl.ch
- 4.3.1 Models and tools developed. Planned: 2015/06/30 - 2015/09/30
- 4.3.2 Pilot plan for innovation hubs approved and launched. Planned: 2014/12/31 - 2015/03/31
- 4.3.3 Report on innovation hubs produced. Planned: 2015/09/30 - 2014/04/30

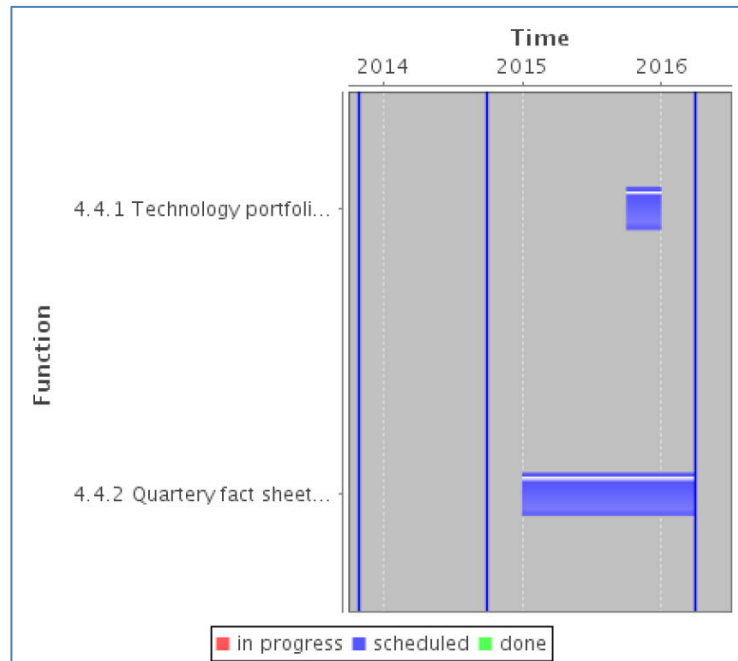


SP13.4_SKPI-16 Development of technology portfolio

- Responsible: annika.hjelm@epfl.ch

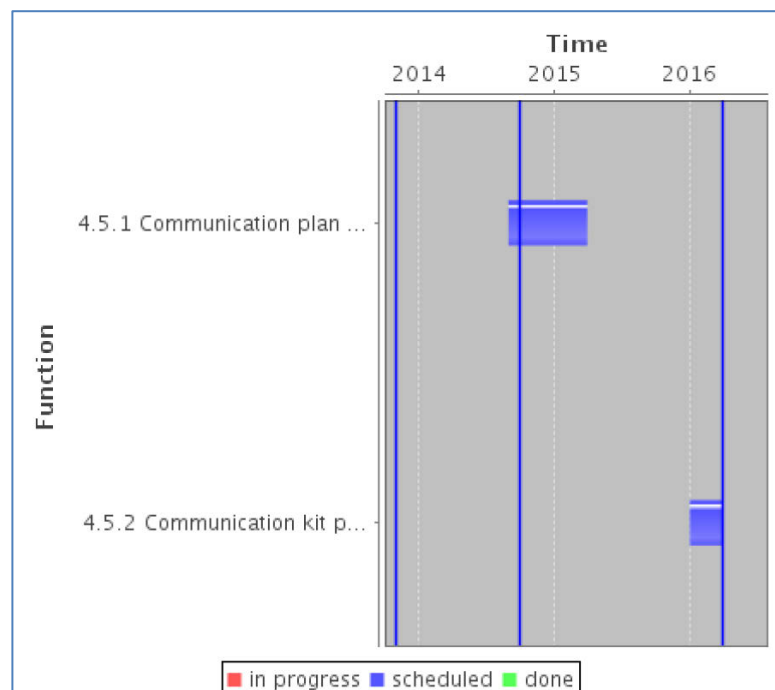


- 4.4.1 Technology portfolio developed and format approved. Planned: 2015/09/30 - 2015/12/31
- 4.4.2 Quarterly fact sheets (5). Planned: 2014/12/31 - 2016/03/31



SP13.4_SKPI-17 Development of communication approach and materials

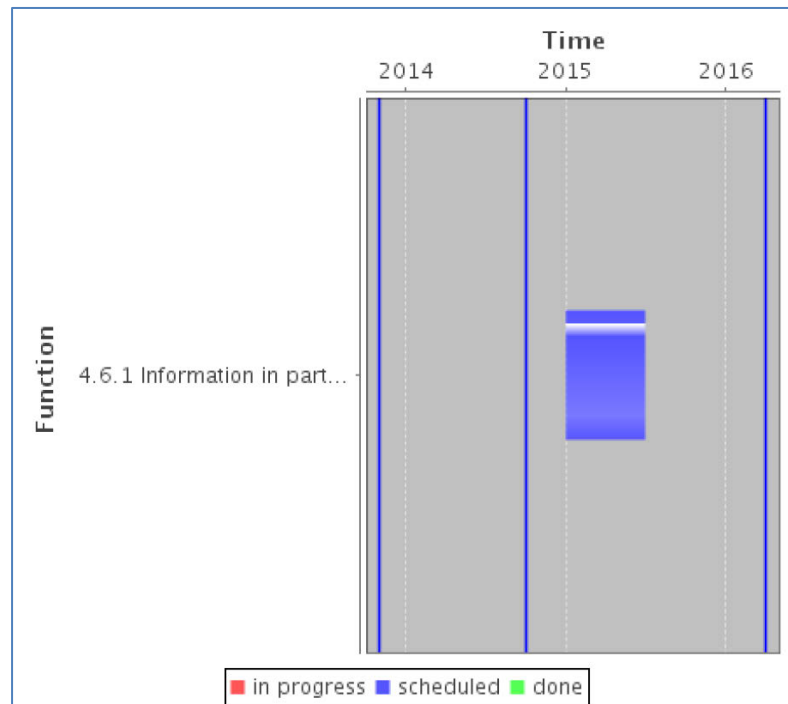
- Responsible: annika.hjelm@epfl.ch
- 4.5.1 Communication plan produced and approved. Planned: 2014/08/30 - 2015/03/30
- 4.5.2 Communication kit produced for each target audience. Planned: 2015/12/31 - 2016/03/31





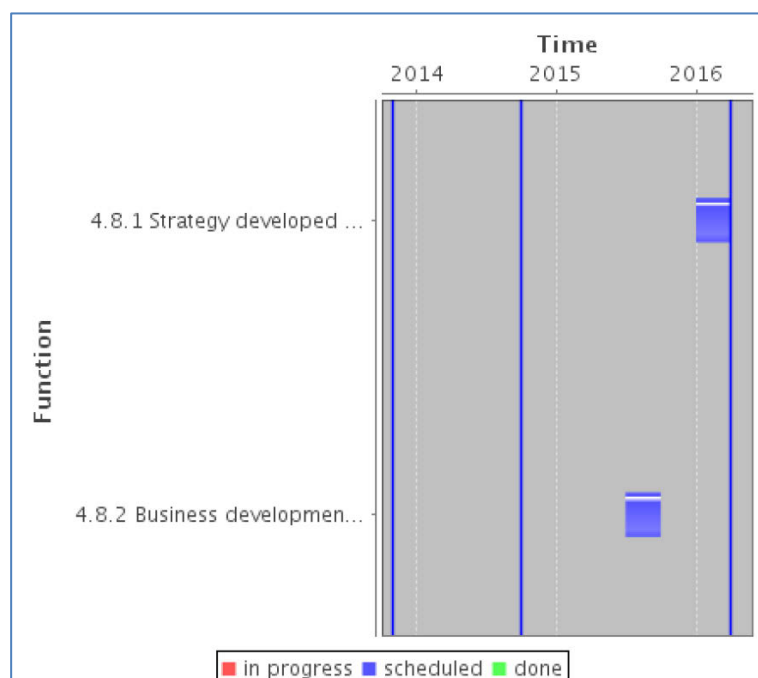
SP13.4_SKPI-18 EC relation: DGs and EU policies, programs

- Responsible: annika.hjelm@epfl.ch
- 4.6.1 Information in partner database included. Planned: 2014/12/31 - 2015/06/30



SP13.4_SKPI-19 Strategy for operational phase

- Responsible: annika.hjelm@epfl.ch
 - 4.8.1 Strategy developed and approved. Planned: 2015/12/31 - 2016/03/31
 - 4.8.2 Business development manager hired. Planned: 2015/06/30 - 2015/09/30







Annex C: Clarifications about the HBP Education Programme (T13.4.3)

NOTE: Elisabeth Wintersteller (IMU, P36) of the HBP Education Team has contributed this section of the Deliverable. It provides clarifications about the Education Programme, in response to specific questions posed by EC project officer Jose Fernandez-Villacanas.

Deliverable D13.4.2 sets commitments to be followed up, i.e. for M12. Check later these are fulfilled (pg. 26)

HBP foundation documents (DoW, CA, etc.) set out the expectation that Subprojects must contribute to the Education Programme (this is confirmed in the FPA proposal p.27). The Chief Governance Officer has been informed by the EPO, and both are working closely together to ensure that these formal requirements are taken into consideration during the preparation of the first Specific Grant Agreement.

Deliverable D13.4.3 (M12) First progress report on the ERP should also include an update on the Education Programme

The main management tasks and achievements for the first year of the Project were:

- Implementation of the Education Programme Committee
- Launch of the Education Website
- Completion of the first HBP Education Workshop and the first HBP School
- Definition of the first version of the HBP Curriculum and recruitment of the five Syllabus leaders to support the EPO to prepare the teaching of the HBP Curriculum

The Education Programme Office is currently planning the future HBP Schools and Education Workshops. The second HBP School supported by UHEI (P45) will be held in M11 and will focus on Future Computing. The third HBP School, supported by UTHSC (P75), will be held in summer 2016 and will focus on Future Neuroscience—specifically, genes to cognition. The second HBP Workshop will take place at CHUV (P23) in Spring 2015 and will focus on Future Medicine. The specific Call was published in M12 on the HBP Education Website.

Education committee formed (M6) from the different subprojects and first meeting in Frankfurt. Can you clarify who is this committee? Is it the education office and the advisory board? Who else?

- The Education Programme Office staff:
- Alois Saria (IMU) - Director of the Education Programme
- Christiane Riedl (IMU) - Project Manager of the Education Programme
- Elisabeth Wintersteller (IMU) - Project Assistant of the Education Programme

The Education Programme Committee acts as advisory board to the Education Programme Office. It will provide advice on sites chosen for Summer Schools in the Ramp-Up Phase and selection of topics for Schools and Workshops. Members assist in identifying and inviting scientists to act as tutors, approve guidelines for Syllabuses, Workshops and Summer Schools and selection of participants. In addition, they provide input for the definition of the EP Curriculum for postgraduate students and on the content of online education material. Subproject leaders and associates have been approached for nominations of scientists in order to cover all scientific fields of the HBP research areas.



The Education Programme Committee consists of at least one representative per Subproject:

- SP1 - Francesco Pavone (LENS)
- SP2 - Simon Eickhoff (UDUS)
- SP3 - Florent Meyniel (CEA)
- SP4 - Gaute Einevoll (UMB)
- SP5 - Sonja Grün (FZJ)
- SP6 - Markus Diesmann (FZJ), Jeanette Hellgren-Kotaleski (KTH), Egidio D'Angelo (UNIPV)
- SP7 - Sergi Girona (BSC)
- SP8 - Giovanni Frisono (HUG), Mira Marcus-Kalish (TAU)
- SP9 - David Lester (UMAN)
- SP10 - Eduardo Ros (UGR)
- SP11 - Giovanni Frisoni (HUG)
- SP12 - Kevin Grimes (KI)

Additional advisors of the Education Programme Office:

- Uri Ashery (TAU)
- Kirsty Grant (CNRS)
- Annika Hjelm (EPFL)
- Irina Kopysova (CNRS)
- Karlheinz Meier (UHEI)
- Sylvie Renaud (IMS)
- Robert Williams (UTHSC)

All the people listed above form the wider Education Programme Committee, but the Education Programme Office at IMU carries out the main operations. The Education Programme Committee acts as scientific advisory board to the Education Programme Office. So far it has met twice and plans to meet at least once or twice a year in the future. At these meetings the Education Programme Office presents the progress of the education programme to the Education Programme Committee. Further, tasks and actions that have been defined and that have to be carried out in the Ramp-Up Phase and tasks and actions that are in preparation for the Operational Phase are discussed and feedback is collected. Periodically, the Education Programme Committee Members are consulted for input for certain policy documents via email.

First release of online education services and HBP curriculum (M6). What do you exactly understand by this?

The Education Website is the main tool for online education services and additional support of all elements of the HBP Education Programme. In detail information about and application function for schools and workshops is provided as well as application guidelines for both events are available to make the process of student selection for participation transparent. Further a discussion forum was set up for collaboration among students.

The first version of the HBP Curriculum, i.e. the basic structure of syllabi and objectives, is defined in the M6 Deliverable. It is combined with a series of specific recorded lectures offered through the website.



Report on the workshop and summer school.

Please check the two reports attached. They are also available on EMDESK.

HBP education website launched 18/4. Give URL; explain why needs registration, not just news!

URL: <https://education.humanbrainproject.eu>

Registration is needed because we provide some confidential material on the Education Website that is for the HBP Community only. The parts of the Website that are not protected by IPR will be transferred to the public section at the beginning of the Operational Phase.

Marie Curie ITN application - more details (as in FPA).

The Marie Skłodowska -Curie actions allow the application for Partnering Projects that can be associated not only to the HBP Education Programme but in general to the HBP. The aim of the EPO is to encourage the HBP Consortium to apply for Marie Skłodowska -Curie ITN is that in case of a successful application more students can be employed in the HBP as for each ITN 540 PM are funded. This can increase the number of HBP students who participate in the transdisciplinary HBP Curriculum and innovative training structures defined in ITNs can be integrated into HBP education. Furthermore coordinating and monitoring of Marie Skłodowska -Curie applications of Consortium members by the Education Programme Office is important to avoid duplications and redundancies.

How will training on Platforms be organised from the Platform SPs? Details. How will this happen in practice?

As stated in the Education Programme's M6 Deliverable, the HBP Platforms are responsible for training Platform users: (please see p.11 of Deliverable)

"The text in the DoW that described the Education Programme included the provision of training to users of the six HBP Platforms (Neuroinformatics, Brain Simulation, High Performance Computing, Medical Informatics, Neuromorphic Computing and Neurorobotics). However, the Platforms themselves are better placed to provide such training than the Education Programme, having both the necessary technical expertise and a far better insight into users' learning needs. On 22 May 2014, the HBP Executive Committee confirmed that the Platforms are responsible for training their own users. However, the Platforms must report their training activities to the EPO, so that all HBP education and training activities are reported collectively to the EC. This report will be compiled by the EPO. The EPO will ensure that the Platforms are promoted and explained appropriately in EP Syllabuses, Schools and Pilot Webinars."

The Education Programme Office is currently developing communication structures with the Platforms to ensure that all training activities are reported properly to the Education Programme Office.

Tailoring educational material to each student may take a long time; are you having types of students or preparing for different types? Or individualising later the content prepared?

The educational material is tailored for each of the five Syllabi, as this is required by the unique structure of the HBP Curriculum.



Extra budget for industrial exploitation education (preparation) for the Ramp-Up Phase? Clarify.

The EPO is currently developing a sponsorship strategy for educational events in conjunction with the Industry Relations Manager. Further the EPO has confirmed with the Industry Relations Manager what additional resources will be needed to set up the IP & Translation and Exploitation of Research Results Syllabus. The EPO will contact the Chief Administrative Officer after the January 2015 review in Brussels, and will request a supplementary budget for the Ramp-Up Phase.

Coaching and mentoring programme. Only for females?

The coaching and mentoring programme will be designed for female PhD students and female post-docs (with no more than three years of experience). This is particularly important since in the fields of engineering and computing female participation is low.

Who are the syllabus leaders? (M10)

The Syllabus leaders are:

- ICT for non-specialists: David Lester (UMAN)
- Brain Medicine for non-specialists: Mira Marcus-Kalish (TAU)
- Neuroscience for non-specialists: Cyril Poupon (CEA)
- Research Ethics and Societal Impact: Abdul Mohammed (LNU)
- Intellectual Property Rights, Translation & exploitation of research: Kathleen Elsig (EPFL)

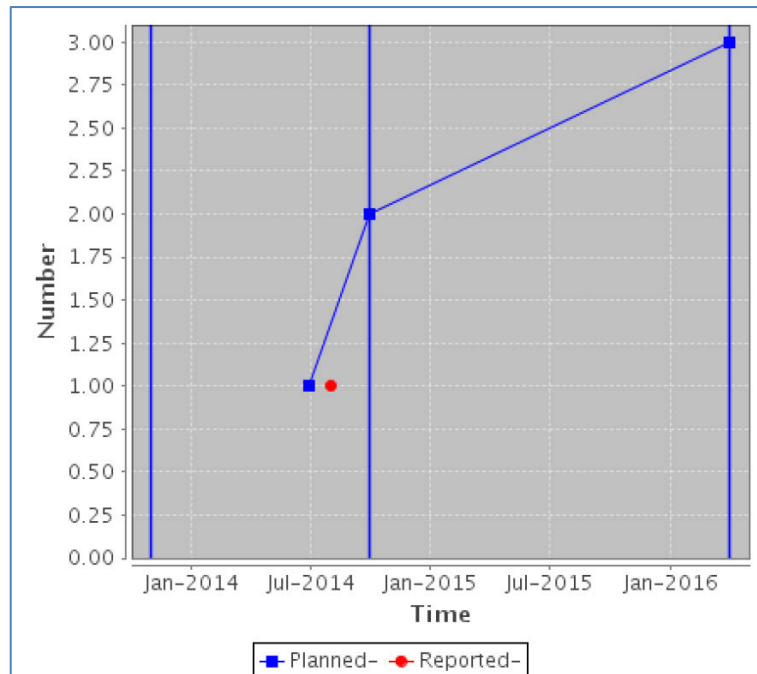


Annex D: Education Scientific Key Performance Indicators (SKPIs)

SP13.4.3_SKPI-01 Workshops

- Responsible: christiane.riedl@me.com

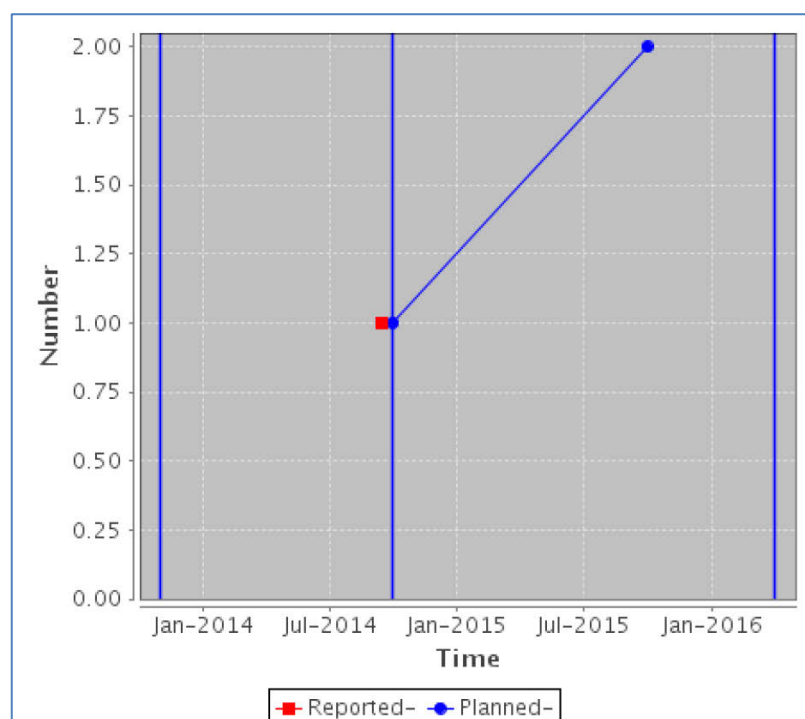
2014/08/01 (value 1): done



SP13.4.3_SKPI-02 Summer Schools

- Responsible: christiane.riedl@me.com
14.09.2014, Congress Centre Alpbach, Alpbach, Austria

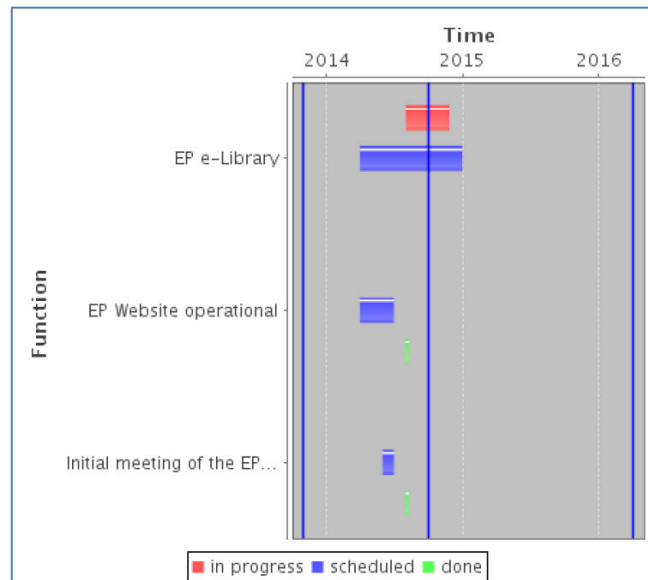
2014/09/14 (value 1): done





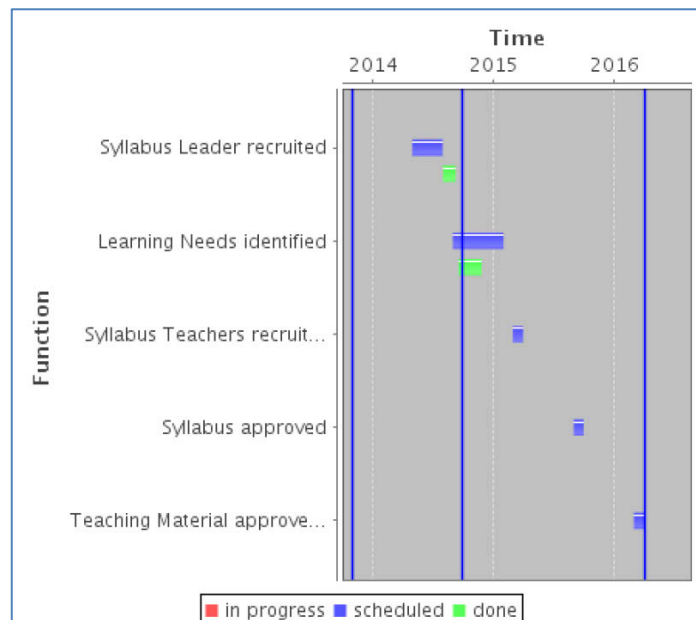
SP13.4.3_SKPI-03 Other operational actions to reach target audience

- Responsible: christiane.riedl@me.com
- EP Website operational. Planned: 2014/03/31 - 2014/06/30
- EP e-Library. Planned: 2014/03/31 - 2014/12/31
- Initial meeting of the EP Advisory Committee. Planned: 2014/05/31 - 2014/06/30



SP13.4.3_SKPI-04 Preparation of syllabus ICT for Non-Specialists

- Responsible: christiane.riedl@me.com
- Syllabus Leader recruited. Planned: 2014/04/30 - 2014/07/31
- Learning Needs identified. Planned: 2014/08/31 - 2015/01/31
- Syllabus Teachers recruited. Planned: 2015/02/28 - 2015/03/31
- Syllabus approved. Planned: 2015/08/31 - 2015/09/30
- Teaching Material approved. Planned: 2016/02/29 - 2016/03/31

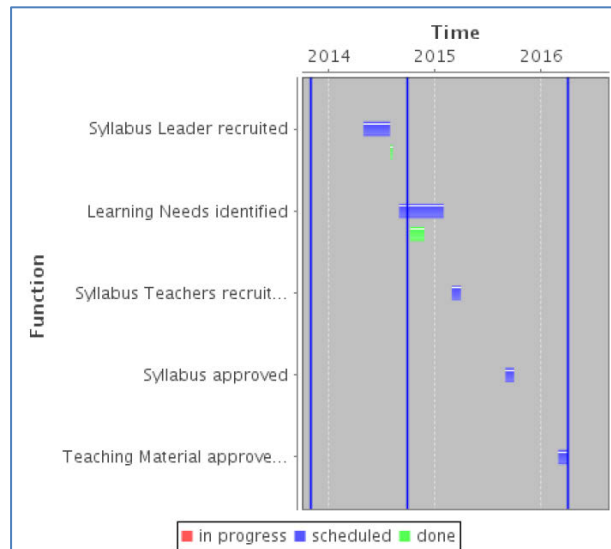






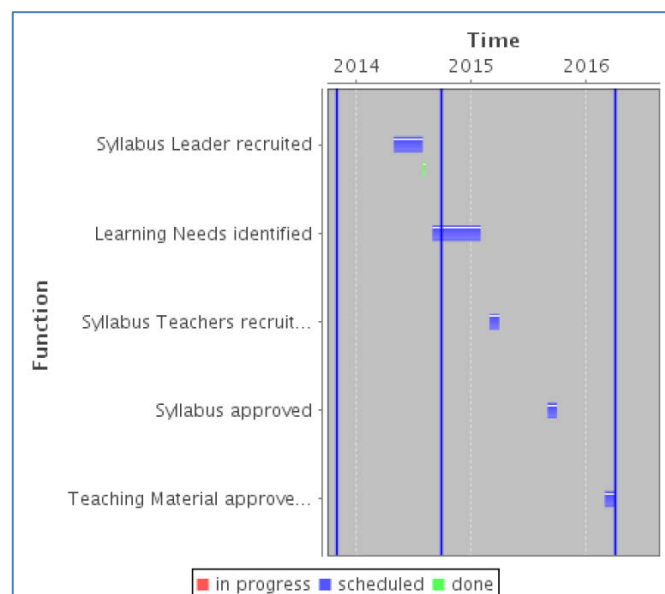
SP13.4.3_SKPI-05 Preparation of syllabus Brain Medicine for Non-Specialists

- Responsible: christiane.riedl@me.com
- Syllabus Leader recruited. Planned: 2014/04/30 - 2014/07/31
- Learning Needs identified. Planned: 2014/08/31 - 2015/01/31
- Syllabus Teachers recruited. Planned: 2015/02/28 - 2015/03/31
- Syllabus approved. Planned: 2015/08/31 - 2015/09/30
- Teaching Material approved. Planned: 2016/02/29 - 2016/03/31



SP13.4.3_SKPI-06 Preparation of syllabus Neuroscience for Non-Specialists

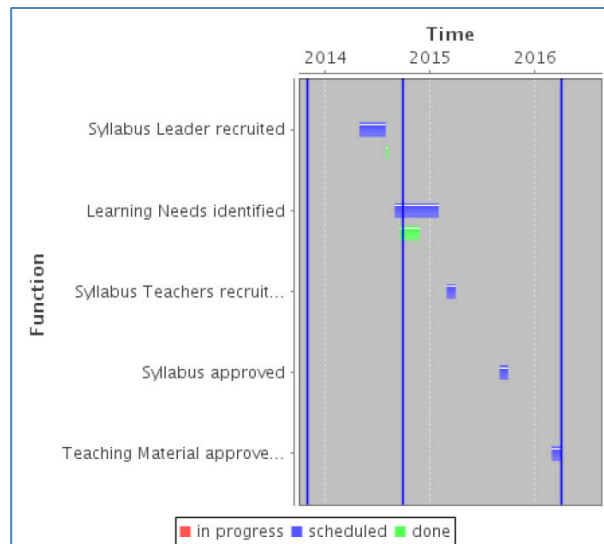
- Responsible: christiane.riedl@me.com
- Syllabus Leader recruited. Planned: 2014/04/30 - 2014/07/31
- Learning Needs identified. Planned: 2014/08/31 - 2015/01/31
- Syllabus Teachers recruited. Planned: 2015/02/28 - 2015/03/31
- Syllabus approved. Planned: 2015/08/31 - 2015/09/30
- Teaching Material approved. Planned: 2016/02/29 - 2016/03/31





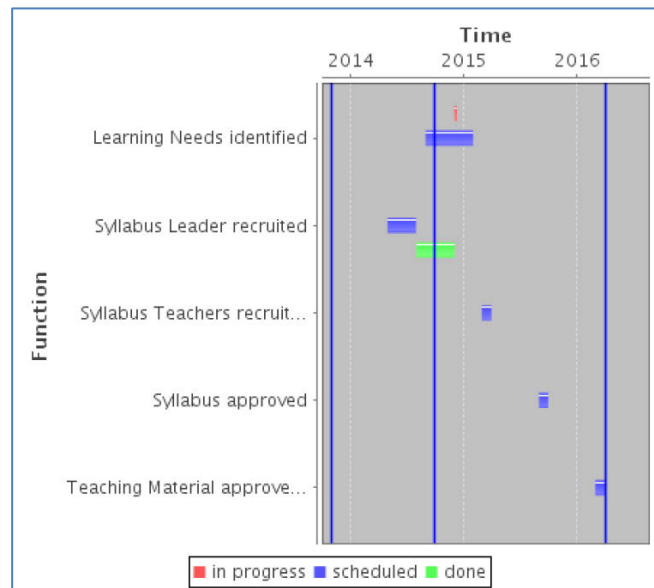
SP13.4.3_SKPI-07 Preparation of syllabus Research Ethics Societal Impact

- Responsible: christiane.riedl@me.com
- Syllabus Leader recruited. Planned: 2014/04/30 - 2014/07/31
- Learning Needs identified. Planned: 2014/08/31 - 2015/01/31
- Syllabus Teachers recruited. Planned: 2015/02/28 - 2015/03/31
- Syllabus approved. Planned: 2015/08/31 - 2015/09/30
- Teaching Material approved. Planned: 2016/02/29 - 2016/03/31



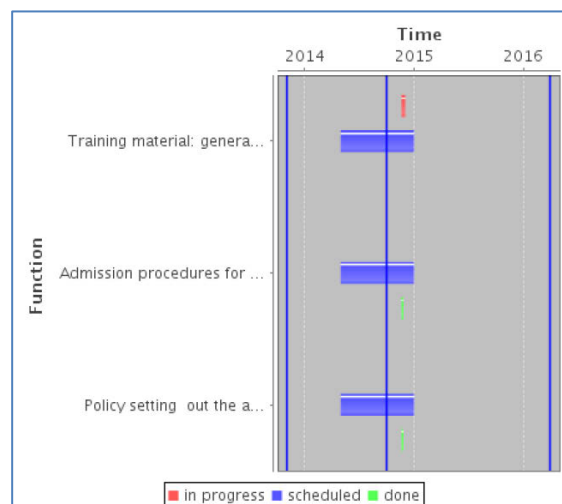
SP13.4.3_SKPI-08 Preparation of syllabus Intellectual property Rights IPR, translation & exploitation

- Responsible: christiane.riedl@me.com
- Syllabus Leader recruited. Planned: 2014/04/30 - 2014/07/31
- Learning Needs identified. Planned: 2014/08/31 - 2015/01/31
- Syllabus Teachers recruited. Planned: 2015/02/28 - 2015/03/31
- Syllabus approved. Planned: 2015/08/31 - 2015/09/30
- Teaching Material approved. Planned: 2016/02/29 - 2016/03/31



SP13.4.3_SKPI-09 Syllabuses additional requirements

- Responsible: christiane.riedl@me.com
- Training material: general guidelines, templates, and quality standards elaborated. Planned: 2014/04/30 - 2014/12/31
- Admission procedures for HBP Students to access training material defined: eligibility criteria. Planned: 2014/04/30 - 2014/12/31
- Policy setting out the accommodation and other expenses that the EP will cover for students and tea. Planned: 2014/04/30 - 2014/12/31

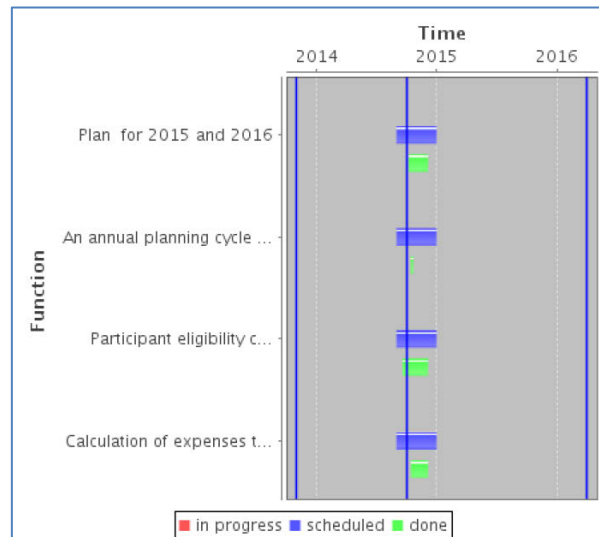


SP13.4.3_SKPI-10 Summer Schools Preparation

- Responsible: christiane.riedl@me.com
- Plan for 2015 and 2016. Planned: 2014/08/31 - 2014/12/31
- An annual planning cycle for operational phase defined. Planned: 2014/08/31 - 2014/12/31
- Participant eligibility criteria and admission procedures defined. Planned: 2014/08/31 - 2014/12/31



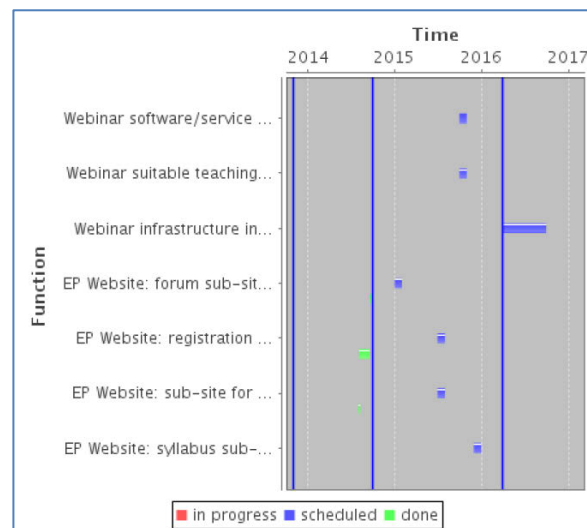
- Calculation of expenses that the EP will cover for students and speaker attending Summer Schools. Planned: 2014/08/31 - 2014/12/31





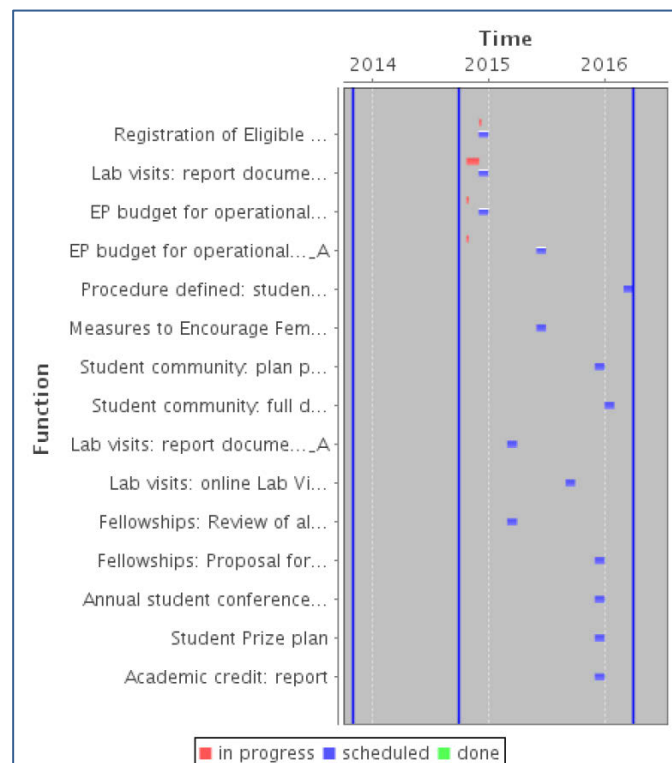
SP13.4.3_SKPI-11 Teaching Infrastructure

- Responsible: christiane.riedl@me.com
- Webinar software/service providers are evaluated and selected. Planned: 2015/09/30 - 2015/10/31
- Webinar suitable teaching locations are verified and confirmed for each teacher for each Syllabus. Planned: 2015/09/30 - 2015/10/31
- Webinar infrastructure installed at locations. Planned: 2016/03/31 - 2016/09/30
- EP Website: forum sub-site operational. Planned: 2014/12/31 - 2015/01/31
- EP Website: registration is operational. Planned: 2015/06/30 - 2015/07/31
- EP Website: sub-site for recorded lectures and slides is operational. Planned: 2015/06/30 - 2015/07/31
- EP Website: syllabus sub-sites for reading lists, closed forums, recorded lectures and slides are op. Planned: 2015/11/30 - 2015/12/31





- SP13.4.3_SKPI-12 Other Student Needs - preparatory actions
- Responsible: christiane.riedl@me.com
 - Registration of Eligible HBP PhD-level Students, list and estimate of annual demand. Planned: 2014/11/30 - 2014/12/31
 - Procedure defined: student Representative to Board of Directors. Planned: 2016/02/29 - 2016/03/31
 - Measures to Encourage Female Scientists. Planned: 2015/05/31 - 2015/06/30
 - Student community: plan presented. Planned: 2015/11/30 - 2015/12/31
 - Student community: full details published on EP website. Planned: 2015/12/31 - 2016/01/31
 - Lab visits: report documenting alternative sources of funding. Planned: 2014/11/30 - 2014/12/31
 - Lab visits: report documenting HBP Partners? Capacity to host lab visits. Planned: 2015/02/28 - 2015/03/31
 - Lab visits: online Lab Visit management system operational. Planned: 2015/08/31 - 2015/09/30
 - Fellowships: Review of all EU and national funding possibilities for international higher education. Planned: 2015/02/28 - 2015/03/31
 - Fellowships: Proposal for a fully funded scheme for three types of award. Planned: 2015/11/30 - 2015/12/31
 - Annual student conference plan. Planned: 2015/11/30 - 2015/12/31
 - Student Prize plan. Planned: 2015/11/30 - 2015/12/31
 - Academic credit: report. Planned: 2015/11/30 - 2015/12/31
 - EP budget for operational phase: plan. Planned: 2014/11/30 - 2014/12/31
 - EP budget for operational phase: document on services SPs are to provide and any compensation that t. Planned: 2015/05/31 - 2015/06/30





Annex E: Report on the First HBP Education Workshop on New Frontiers in Neuroscience and Methods of Transdisciplinary Education

18th-20th June 2014, Tel Aviv University, Tel Aviv, Israel



Workshop Summary

The 1st HBP Workshop took place from June 18th to 20th, 2014 at Tel Aviv University in Israel (MS241).

Call for the 1st HBP Workshop (MS239): The call has been published according to the "Guidelines for calls for HBP Workshops" on April 11th, 2014 on the HBP Education Website and has been communicated to the HBP Consortium via the HBP Newsletter on Tuesday, April 15th, 2014.

Promotion of the 1st HBP Workshop: A flyer to promote the event has been designed and provided to the HBP community via the HBP Newsletter on April 15th, 2014 and the Education Website. Also it has been forwarded to the Education Programme Committee for distribution to their scientific community. On April 14th and 15th national and mono-disciplinary member societies of the Federation of Neuroscience Societies have been contacted to inform their members about the first HBP Education Workshop. The event has also been published on the upcoming event page of the HBP Public website (www.humanbrainproject.eu) On May 15th, 2014 a reminder for the application has been sent to all PIs in HBP as well as to students registered on the HBP Education Website.

Application Deadline: The application deadline for the workshop was May 20th, 2014 and has been extended to June 3rd, 2014. The extended application deadline has been announced in the HBP newsletter on June 3rd, 2014 as well as in the public news section on the Education Website.

Student Selection: On May 22nd and June 3rd 2014 students have been informed about their selection for their participation at the 1st HBP Workshop. Students have been chosen according to the student selection guidelines of the HBP Education Programme.

Number of participants on day 1 and day 2: 26 senior scientists and 49 students

Open public session on day 3: Additional 80 people outside the university joint this special session

Poster Session: In total 21 posters were presented by students during the two poster sessions. Posters with uneven numbers were presented on day one and posters with even numbers on day two.

Student oral presentations: Nine students were selected to give a short oral presentation about their scientific work in addition to the poster session. Details can be found in the scientific programme of the workshop.

Live Stream of scientific lectures: All scientific lectures and panels have been live-streamed throughout the meeting and all HBP PIs and HBP students have received a link per Email to follow the live-stream, if wanted.



Workshop evaluation: On day two of the workshop student and faculty ratings have been distributed and collected for the evaluation of the event. The evaluation of the forms can be found in the HBP Workshop evaluation documentation.

Online Material for the HBP Education Website: All scientific lectures and Panel Discussions have been recorded and will be provided to the HBP community on the HBP Education Website. In addition posters and abstracts of students that granted their permission will be uploaded and provided to the HBP community.

Workshop Programme

- Wednesday, 18th June
 - 08:30-09:30 Registration
 - 09:30-09:50 Opening
 - Joseph Klafter, President, Tel Aviv University
 - Alois Saria, HBP Education Programme Director
 - Christine Bandtlow, Vice-Rector of Innsbruck Medical University
 - Mira Marcus-Kalish, HBP, Medical Informatics
- Opening Lectures
 - 09:55-10:25 The Human Brain Project: From Dream to Reality - Idan Segev (HUJI)
 - 10:25-10:40 Educating the Next Generation of Neuroscientists - The Sagol School of Neuroscience Approach - Uri Ashery (Sagol School, TAU)
 - 10:40-10:55 Coffee Break
- First Session
 - New Frontiers in Neuroscience I - Chair: Galit Yovel (The Sagol School of Neuroscience)
 - 10:55-11:25 From Bat Behaviour to Robot Behaviour - Yossi Yovel (TAU)
 - 11:25-11:55 Human Vision & Machine Vision: How They May Help Each Other Recognize Faces? - Galit Yovel (TAU)
 - 11:55-12:25 Neurovascular Coupling in the Omic Era- Pablo Blinder (TAU)
 - 12:25-12:55 The Role of Neuroimaging in Redefining Neuroplasticity Beyond the Synapse - Yaniv Assaf (TAU)
 - 12:55-14:20 Lunch Break + Poster session I
 - Posters with uneven numbers. Poster number = Poster board number.
 - Location of Poster Session: Lobby in front of lecture hall
- Second Session
 - New Frontiers in Neuroscience II - Chair: Yadin Dudai (WIS)
 - 14:20-14:50 Epigenetic History: Beyond the Blueprint - Oded Rechavi (TAU)
 - 14:50-15:20 Cognitive Neuroscience - Rafi Malach (WIS)
 - 15:20-15:50 Ethics in Neuroscience - Yadin Dudai (WIS)
 - 15:50-16:20 Medical Informatics and Data Mining - Yoav Benjamini (TAU)
 - 16:20 -16:50 Coffee Break
- 16:50-18:35 Special Student Session
 - Chair: Daniel Voisin (Neurasmus, Bordeaux University)
 - Conceptual Association of Object-Pairs Overcomes the Cost of Clutter in Object-Category Selective Cortex - Michal Bernstein, Merav Lutzky, Yaara Erez & Galit Yovel,



- Towards a Model of Motivation and Decision Making, Based on Human Data from Single Units Through LFP to fMRI - Feldesh, R., Gonen T., Fried I., Hendler T., Gazit T.
- Transient But Consistent Motor Cortex Activity Modulations as a Reliable Signature for Prior Motor Experience - Ella Gabitov, David Manor and Avi Karni
- The Dendextend R Package: Visualizing Clusters of Alzheimer Patients - Tal Galili, Alexis Mitelpunkt, Netta Shachar, Mira Marcus-Kalish, Yoav Benjamini
- Understanding Synaptic Pathways - Modelling Parkinson's Disease - KF Heil, O Sorokina, J Hellgren Kotaleski, JD Armstrong
- Neural Signatures of Processing Faces and Objects as Manifested in Steady-State Visual Evoked Potentials - Libi Kliger, Leon Y Deouell, Shlomo Bentin
- Dissecting the Effects of Iron and Ageing on Automated Brain Tissue Classification - Lorio S., Lutti A., Kherif F., Ruef A., Helms G., Weiskopf N. & Draganski B.
- Successful Rescue of Impaired Fear Extinction Induces Dynamic Regulation of miRNAs in the Amygdala - Conor Murphy, Ronald Gsür, Verena Maurer Simon Schafferer, Nigel Whittle, Alexander Hüttenhofer, Nicolas Singewald
- Human CORD7 RIM Mutation Modulates Presynaptic Plasticity in Drosophila - Mila Paul, Manfred Heckmann, Jennifer Gehring, Robert J. Kittel, Aaron DiAntonio, Georgios Hatzopoulos, Jonathan Shiroma, Ioannis Vakonakis, Tobias Langenhan
- 19:00 Get-together, Reception
 - Location: Beit Hatfuzot, Details will be announced onsite

Thursday, 19th June

- Education in Neuroscience in the 21st Century
 - 09:00-10:30 Panel A: Neuroscience Education, the Future: Online Tools and Public Involvement. - This panel will discuss the online educational approach and existing platforms including the large-scale involvement of the public.
 - Moderator: Charles Guttman (Harvard University)
 - Panelists:
 - Charles Guttman (Harvard University) Leveraging Synergies Between Science and Education: The SPINE Virtual Laboratory and Citizen Science Platform for Image-Driven Neuroscience
 - Reuven Babai (The Sagol School of Neuroscience) Neuroscience & Education: Mutual Challenges and Hopes
 - Shani Ben-Ari Fuchs (LifeMap Science) Compiling the Knowledge Base for Neuroscience Education: Extending LifeMap's Models and Online Tools by the Scientific Community
 - Hugo Vrenken (VU, Amsterdam) How Education and Public Involvement in Human Neuroimaging Could Help Patients
 - David Horrigan (HBP Chief Communications Officer, EPFL) Why Neuroscience Education is Special
 - 10:30 -10:45 Coffee Break
 - 10:45-12:15 Panel B: Industry-Academy Education: What Should Be Done to Enhance Such a Collaboration? - This panel will include example of several modes of operation to increase industry and academy collaboration and integration of courses aimed at providing complementary skills for students such as patent issuing, IP management, FDA and CE regulation and ethics.
 - Moderator: Uri Ashery (Sagol School, TAU)



- Panellists:
 - Michale Rosen-Zvi (IBM) A New Era of Cognitive: IBM View
 - Liat Hayardeny (Scientific Director, Teva) Why Are Basic Science and Mechanisms Important for Licensing New Molecules to Clinical Trials Design: The Case of Laquinimod
 - Shlomo Nimrodi (Ramot, TAU) From Basic Science to Industry... What Does it Take?
 - Dani Offen (TAU) Benefits and Challenges of Academia Industry Collaboration
 - Uri Ashery (Sagol School, TAU) BrainBoost, a New Concept to Accelerate Industry Academy Cooperation
- 12:30-14:15 Lunch Break + Poster Session II
 - Posters with even numbers. Poster number = Poster board number.
 - Location of Poster Session: Lobby in front of lecture hall
- 14:15-15:45 Panel C: Academic Programs & Career Development: Undergraduate and Graduate Programs and What Next? - This panel will focus on shaping the next generation of neuroscientists, based on existing interdisciplinary programs and new tailored ones.
- Moderators: Alois Saria (HBP Education Programme Director, IMU); Uri Ashery (Sagol School, TAU)
- Panellists:
 - Alois Saria (HBP Education Programme Director, IMU) A Curriculum for Teaching Students in the Human Brain Project: Needs and Challenges
 - Menno Witter (Chair Education and Training Committee, Federation of European Neuroscience Societies) FENS and European Training: The Cajal European Training Programme
 - Daniel Voisin (Neurasmus, Bordeaux University) Neurasmus, an Erasmus Mundus Master in Neuroscience: Lessons and Promises
 - Uri Ashery (Sagol School, TAU) Neuroscience, Is it Already a Standalone Discipline?
- 15:45-16:15 Special Lecture
 - The HBP Mixed Doubles: Computing for Neuroscience and Neuroscience for Computing
 - Karlheinz Meier (UHEI)
- 16:15-16:45 Coffee Break
- 16:45-18:15 Panel D: Clinical Neuroscience Education. - This panel will focus on subjects of Clinical Neurosciences education for students aiming to be clinicians or clinical researchers, the inter-phase between Clinical Neurosciences and the medical pharma and Ethical issues in Clinical Neurosciences
- Moderator: Nir Giladi (Soursky Medical Center)
- Panellists:
 - Anat Achiron (Sheba Medical Center) The Arrow Project Incorporating Research into Medical Studies
 - Illana Gozes (TAU) From Bench to Biotech: Davunetide's Clinical Development
 - Hilik Levkovitz (Shalvata Mental Health Center) Bridging the Impossible Gap between Clinical Neuroscience and Psychiatry
 - Nir Giladi (Soursky Medical Center) Exposing Students Who Will Not Be Clinicians to Clinical Neuroscience



Friday, 20th June

- Special Open Public Session
 - Brain Research - Education and Public Outreach
 - Britania building, Hall 14, 9:00-12:00
 - Chair: Mira Marcus-Kalish, HBP, Medical Informatics
- Special Lectures:
 - An International Approach Towards Brain Research Public Education
David Horrigan, HBP Chief Communications Officer, EPFL
 - The Science Museum as a Lab and Hub
Maya Halevy, The Bloomfield Science Museum Jerusalem
 - Exceptional Young Minds - The Challenge
Shira Shofty & Or Sagy, The Lautman Unit for Science-Oriented Youth, TAU
- Break
- From Bat Behavior to Robot Cognition
 - Yossi Yovel, Zoology, Sagol School of Neuroscience, TAU
- Alzheimer Disease Risk and Hopes
 - Danny Michaelson, Neurobiology, Sagol School, TAU

List of Posters

Alphabetical order according to presenting author

- 1) Conceptual Association of Object-Pairs Overcomes the Cost of Clutter in Object-Category Selective Cortex. Michal Bernstein, Merav Lutzky, Yaara Erez & Galit Yovel,
- 2) Towards a Model of Motivation and Decision Making, Based on Human Data from Single Units Through LFP to fMRI. Feldesh, R., Gonen T., Fried I., Hendler T., Gazit T.
- 3) Transient but Consistent Motor Cortex Activity Modulations as a Reliable Signature for Prior Motor Experience. Ella Gabitov, David Manor and Avi Karni
- 4) Procedural Memory Consolidation in the Elderly: Effects of Timing of Training and Quality of Post Training Sleep on Memory Trace Representation. Gal C, Korman M, Karni A
- 5) The Dendextend R Package: Visualizing Clusters of Alzheimer Patients. Tal Galili, Alexis Mitelpunkt, Netta Shachar, Mira Marcus-Kalish, Yoav Benjamini
- 6) The Effect of Acute Stress on Pain Modulation. Nirit Geva and Ruth Defrin
- 7) Understanding Synaptic Pathways - Modelling Parkinson's Disease. KF Heil, O Sorokina, J Hellgren Kotaleski, JD Armstrong
- 8) Vowel Letter Dyslexia. Lilach Khentov-Kraus and Naama Friedmann
- 9) Neural Signatures of Processing Faces and Objects as Manifested in Steady-State Visual Evoked Potentials. Libi Kliger, Leon Y Deouell, Shlomo Bentin
- 10) Cluster Visualization Using Banded Matrices. Jan Kralj
- 11) Abstract Title not Provided. Janez Kranjc
- 12) Dissecting the Effects of Iron and Ageing on Automated Brain Tissue Classification. Lorio S., Lutti A., Kherif F., Ruef A., Helms G., Weiskopf N. & Draganski B.
- 13) Abstract Title not Provided. Rinatia Maaravi-Hesseg



- 14) Characterizing Stress-Induced Resting-State Functional Connectivity Changes Using Anatomic Enrichment Analysis. Adi Maron-Katz
- 15) Successful Rescue of Impaired Fear Extinction Induces Dynamic Regulation of miRNAs in the Amygdala. Conor Murphy, Ronald Gstir, Verena Maurer Simon Schafferer, Nigel Whittle, Alexander Hüttenhofer, Nicolas Singewald
- 16) Functional, Structural and Topological Resting-State Alterations in Heroin-Dependent Individuals. N. Pandria, L. Kovatsi and P. D. Bamidis
- 17) Human CORD7 RIM Mutation Modulates Presynaptic Plasticity in Drosophila. Mila Paul, Manfred Heckmann, Jennifer Gehring, Robert J. Kittel, Aaron DiAntonio, Georgios Hatzopoulos, Jonathan Shiroma, Ioannis Vakonakis, Tobias Langenhan
- 18) The Roles of Perceptual and Conceptual Information in Face Recognition
- 19) Linoy Schwartz, Galit Yovel
- 20) Bodies Contribute to Person Recognition from Still Images Only if People Were Seen in Motion. Noa Simhi, Ofir Becker, Rita Krigman & Galit Yovel
- 21) Automated Modeling of System Dynamics and its Applications. Nikola Simidjievski, Ljupco Todorovski, Sašo Džeroski
- 22) Abstract Title not Provided. Anna Maria Wieczorek, MA

Summary of the Panel Discussions

Panel A:

Neuroscience Education, the Future: Online Tools and Public Involvement

This panel discussed the online educational approach and existing platforms including the large-scale involvement of the public.

Participants: Charles Guttman (Harvard University), Reuven Babai (The Sagol School of Neuroscience), Shani Ben-Ari Fuchs (LifeMap Science, Tel Aviv), Hugo Vrenken (VU, Amsterdam), David Horrigan (HBP Chief Communications Officer, EPFL).

Comments and suggestions:

Enhancing the synergy between education and research: There are several online tools that are available or under development (like SPINE, Lifemap science <http://www.lifemapsc.com/>). HBP can create links to these sites and encourage the implementation of online tools - both for students and the public.

Online courses:

Several questions have been raised about different ways to run online courses. Courses can be filmed at any time and broadcasted at a specific time of the week - each lecture can be followed by an online session with the lecturer in which students can ask questions and the lecturer can trigger a discussion (this can also be done in small groups).

Incentive for the lecturer is the educational aspect and exposure to students in many labs around Europe.

Gam(e)ification: Enhance gamification of kids and students and enhance the creation of presentations for the public.

Panel B:

Industry-Academy Education: What Should Be Done to Enhance Such a Collaboration?



This panel brought examples of several models of co-operations to increase industry and academy collaboration and integration of courses with the aim of providing complementary skills for students such as patent issuing, IP management, FDA and CE regulation and ethics.

Participants: Michale Rosen-Zvi (IBM), Liat Hayardeny (Scientific Director, Teva), Shlomo Nimrodi (Ramot, TAU), Dani Offen (TAU), Uri Ashery (Sagol School, TAU)

Comments and suggestions:

Collaboration:

A need for new concepts that will reduce the barriers and enhance common language between industry and academy was evident.

IBM has a long lasting research group that is continuously working with academy and creates fruitful ground for such collaboration.

The Sagol School of Neuroscience has started a special initiative called *BrainBoost* to enhance industry and academy collaboration. Under the framework of *BrainBoost*, the Sagol School is organizing annual joint symposiums between different companies and researchers from the Sagol School and allows students to perform rotations (mobility) in the companies. This has already led to new projects with mutual interest of the researchers and the companies. Such an initiative exposes students to the industry, triggers collaboration and brings together the strength of the academy from one side and the industry on the other side.

Panel C:

Academic Programs & Career Development: Undergraduate and Graduate Programs and What Next?

This panel focused on shaping the next generation of neuroscientists, based on existing interdisciplinary programs and new tailored ones.

Participants: Alois Saria (HBP Education Programme Director, IMU), Menno Witter (Chair Education and Training Committee, Federation of European Neuroscience Societies), Daniel Voisin (Neurasmus, Bordeaux University), Uri Ashery (Sagol School, TAU).

Comments and suggestions:

A very important outcome of this panel was that it has exposed the students and the PIs to new opportunities for Master and PhD studies in Europe (Neurasmus Plus, NENS, future HBP program).

Multi disciplinary studies versus one discipline:

Although neuroscience is a interdisciplinary field, both students and PIs highly recommend that students in their initial stages, Bachelor degree, will learn one or maximum two disciplines: they should have one major or a double major for their BSc. Having a double major, as being done in the Sagol School of Neuroscience can enhance the student 'plasticity' already at young stages. Then for the PhD studies, we should encourage the students to come from different disciplines and perform a multidisciplinary research. Hence, the field should encourage the integration of students from different disciplines and provide a series of core courses to integrate students from different disciplines.

Career development:

Both the EU and the NIH are requesting to invest in career development for students and to offer variety of courses in directions of intellectual property, patent, law on ethics, drug



approval and economical aspects. The rationale is that this activity will allow the students more knowledge and experience to find jobs later on. However, many students that attended this workshop claimed that they do want to have more basic academic education and these extra courses should be offered as extra curriculum courses and should not be part of the core syllabus.

Student point of view:

Students were very active during this workshop and provided very important inputs. It will be very important to receive student feedback and suggestions on the different plans related to courses, programs or any other decision related to student education as that might affect the future of these students.

Summer schools or workshops: Opening more training summer schools or workshops will allow more student mobility between institutes, diverse topics and more efficient use of existing facilities and knowledge as each university can offer its best course/workshop.

Panel D:

Clinical Neuroscience Education

This panel focused on subjects of Clinical Neurosciences education for students aiming to be clinicians or clinical researchers, the inter-phase between Clinical Neurosciences and the medical pharma and Ethical issues in Clinical Neurosciences.

Participants: Anat Achiron (Sheba Medical Center), Ilana Gozes (TAU), Hilik Levkovitz (Shalvata Mental Health Center), Nir Giladi (Sourasky Medical Center)

Comments and suggestions:

Clinical neuroscience education is not a very strong field. Suggestions made by the participants and the audience pointed to the establishment of tailored courses for neuroscience students that will expose them to: clinical aspects, patients, clinical education and clinical research skills. This should be done as joint courses between clinicians (Neurologists, psychiatrist, Neuro surgeons) and researchers at the university.

Summary of the Public Session on Friday, June 20th

The public outreach session that has been organized attracted about 80 people although it was on Friday morning and talks were held in English. This shows the thirst for knowledge and science of the public. We suggest continuing similar initiatives throughout the year.



Annex F: Report on the First HBP School

8th-14th September 2014, Congress Centre Alpbach, Alpbach, Austria

School Summary

The 1st HBP School took place from 8th to 14th September 2014 at the Congress Centre Alpbach, Alpbach, Austria. (MS241)

Call for the 1st HBP School (MS239): As written in the “Guidelines for calls for HBP Schools”, the call for the 1st HBP School was published on the 11th of April 2014 on the HBP Education Website. Further the HBP Consortium was informed about the call for the 1st HBP School via the HBP Newsletter on 15th of April.

Promotion of the 1st HBP School: The EPO designed a flyer to promote the event. It was distributed to the HBP community via the HBP Newsletter on April 15th, 2014 and the Education Website. Also it has been forwarded to the Education Programme Committee for distribution to their scientific community. On April 14th and 15th national and mono-disciplinary member societies of the Federation of Neuroscience Societies have been contacted to inform their members about the first HBP School. The event has also been published on the upcoming event page of the HBP Public website (www.humanbrainproject.eu).

Application deadline: The application deadline for the 1st HBP School was the 22nd of June 2014 and has been extended until the 8th of July 2014. The extended application deadline has been announced on the HBP Education Website and was also published in the HBP Newsletter on the 24th of June 2014. Further, the EPO informed all PIs in HBP about the extension of the application deadline via email.

Student Selection: Following the student selection criteria defined in the school guidelines, selected students were informed by mid of July 2014 about their successful application. Students that did not fulfil the selection criteria were also informed that they have not been selected to participate.

Number of participants: A total number of 43 people were present at the 1st HBP School. This amount can be split into 27 students, 16 speakers. Ten out of the 27 students and three out of 16 speakers were female, i.e. in total 30% of the school participants were female. The 1st HBP School was dedicated to the HBP Community only, so no visitors from the public attended the 1st HBP School.

Scientific Programme: The scientific programme covered the three major research areas of the HBP: Future Computing, Future Neuroscience and Future Medicine. The programme combined both lectures of tutorial style and hands-on training small group workshops. The students had the possibility to present a poster on their current research. Therefore two poster sessions were scheduled on the 9th of September in the afternoon. Posters with uneven numbers were presented in the first session; posters with even numbers were presented in the second session.

Small group workshops:

Three small group workshops were held at the school on the following topics:

- Workshop 1 (combined of workshop 1a and workshop 1b):
 - Correlation Analysis of Parallel Spike Trains
 - Simulating large-scale spiking neuronal networks with NEST
- Workshop 2: How to use neuromorphic hardware
- Workshop 3: The increasing lifestyle use of smart drugs by healthy people



On 19th of August students have received an overview of the three workshops plus detailed information on the content and participation requirements. Students had then one-week time to submit a ranking of their preferred workshop and were then assigned to the different workshops considering their preference and capacity of the workshop defined by the workshop organizers. Additional reading material was provided to all participants of the small group workshops about one week before the school. All three groups were asked to prepare a presentation of the outcomes of their workshop. The presentations of the small group workshops were held on the 13th of September in the afternoon.

Student lecture chairs: A number of ten students were informed on the 19th of August via email to act as a student lecture chair. They were instructed to introduce the lecturer and moderate the discussion. A CV of the respective speaker was provided by email before the school.

Recording of scientific lectures and online material for the HBP Education Website: The 13 scientific lectures were recorded and will be made available on the HBP Education Website. Students have been asked on the 16th of September to give their permission to upload their abstract and poster on the HBP Education Website.

During the school the EPO collected all speakers presentation slides and provided them to the participants via the Dropbox. They will also be made available to the HBP Student Community via the HBP Education Website.

School Documents: School documents like the list of posters, the list of participants, a general information, abstract of students and abstract of speakers, student lecture chairs, shuttle list and all information on the small group workshops were provided to all participants via a Dropbox on 3rd of September. It also allows participants to exchange documents via the Dropbox.

Certificates: In the afternoon of the 13th of September all students received a certificate of participation.



1st HBP School - Final Programme Schedule

8th to 14th September 2014 in Alpbach, Austria

Final Programme, 1st of September 2014



Human Brain Project

	Monday, 8th Sept.	Tuesday, 9th Sept.	Wednesday, 10th Sept.	Thursday, 11th Sept.	Friday, 12th Sept.	Saturday, 13th Sept.	Sunday, 14th Sept.
09:00-10:30	Arrival day	Spinnaker System David Lester (UK)	Analysis of parallel electrophysiological data Sonja Grün (Germany)	Optical imaging of the brain Francesco Pavone (Italy)	Meta-analyses and activation databases Simon Eickhoff (Germany)	Medical informatics platform Richard Frackowiak (Switzerland)	Departure Day
10:30-11:00		Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	
11:00-12:30		Neural networks in silico: Physical implementation, architecture and applications Mihai Petrovici (Germany)	Ethics and Society Abdul Mohammed (Sweden)	Simulation of brain-scale neuronal networks at cellular and synaptic resolution Markus Diesmann (Germany)	High performance computing Wolfram Schenck (Germany)	neuGRID: An online environment for research and care in neurodegenerative diseases Paolo Bosco, Alberto Redolfi (Italy)	
12:30-14:00		Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	
14:00-15:30		Poster session 1 uneven poster board numbers	Small group workshops in parallel: Workshop 1a Workshop 2 Workshop 3	Social programme	Small group workshops in parallel: Workshop 1b Workshop 2 Workshop 3	Presentation of outcomes of small group workshops to all participants	
15:30-16:00		Coffee break	Coffee break		Coffee break	Coffee break	
16:00-17:30	Registration	Poster session 2 even poster board numbers	Small group workshops in parallel: Workshop 1a Workshop 2 Workshop 3	Social programme	Small group workshops in parallel: Workshop 1b Workshop 2 Workshop 3	Discussion: Feedback from students	
18:00-19:30	Welcome Reception + Dinner	Dinner	Dinner	Dinner	Dinner		
19:30-21:00	Short Student Introduction Introduction to the HBP David Horrigan (Switzerland) Discussion: What do students expect from the HBP?	Small group workshops kick-off	Optional time for small group workshops	Optional time for small group workshops	Communicate science to the public David Horrigan (Switzerland)	Farewell Dinner	

Workshop 1a: Correlation analysis of parallel spike trains, Sonja Grün (Germany) and Emiliano Torre (Germany)

Workshop 1b: Simulating large-scale spiking neuronal networks with NEST, Markus Diesmann (Germany) and Johanna Senk (Germany)

Workshop 2: How to use neuromorphic hardware, Mihai Petrovici (Germany) and Thomas Pfeil (Germany)

Workshop 3: The increasing lifestyle use of cognitive enhancing, or 'smart' drugs by healthy people, Abdul Mohammed (Sweden) and Barbara Sahakian (UK)

Future Computing
Future Neuroscience
Future Medicine
Ethics and Society



Workshop 1a: Correlation Analysis of Parallel Spike Trains

1st Human Brain Project Flagship School, 8 – 14 Sept. 2014, Alpbach, Austria
Emiliano Torre, Michael Denker, Sonja Grün

In the workshop *Correlation analysis of parallel spike trains*, the students have the opportunity to complete a hands-on tutorial on the analysis of parallel (experimental and simulated) spike data.

Neuronal network processing involves interaction of neuronal activity. In order to get a better understanding of the neuronal processes underlying behavior and cognitive functions, we need to be able to study such neuronal interaction on the individual neuron level, while coping with the statistical features of neuronal activity. Non-stationarities of neuronal activities and deviations from mathematically preferred descriptions of stochastic processes provide obstacles for the analysis of neuronal interactions. Ignorance of these features may lead to false positive outcomes and wrong interpretation of the data. Statistical analysis of the significance of correlations is therefore often performed by the use of surrogate data, i.e. modified original data in which a particular feature under statistical investigation is destroyed.

In this tutorial we provide insights in such correlation analyses approaches. In particular, participants learn how the analysis is influenced by common features of neuronal spike data, such as changes in the firing rates in time, cross-trial variability, or differences in spiking dynamics across neurons. During the exercise, we emphasize the interpretation of results obtained by correlation methods in relation to the features exhibited by the data.

In the first part we concentrate on the analysis of pairs of neurons, and in the second on the analysis of higher-order correlations in massively parallel spike data. Perhaps the most widely used method for correlation analysis of parallel spike trains is the cross-correlation, which quantifies jittered, time-lagged correlation for a pair of neurons [1,2]. Thus the first part of the tutorial is dedicated to apply cross-correlation analysis to various simulated data characterized by different degrees of variability across neurons, time, and trials. Participants will also be provided with tools to generate various types of surrogate data to estimate the statistical significance of observed cross-correlations [3]. In the second part of the tutorial more advanced data analysis techniques are introduced, such as CuBIC [4,5], which estimate population (rather than pairwise) correlations.

The participants will be provided with skeleton code in Python to start working on the analyses, and therefore basic knowledge of the Python is of advantage. Analysis will be based on functionality that is provided by the Functional Data Analysis Toolbox (FDAT) developed within the Human Brain Project.

- [1] Perkel DH, Gerstein GL, Moore GP (1967 Jul) *Biophys J* 7(4):419–440
- [2] Eggermont J J (2010) Chapter 5 in APST
- [3] Louis S, Borgelt C, Grün S (2010) Chapter 17 in APST
- [4] Staude B, Rotter S, Grün S (2010) *J Comput Neurosci*, 29 (1-2): 327—350
- [5] Staude B, Grün S, Rotter S (2010) Chapter 12 in APST

APST: Analysis of Parallel Spike Trains, eds Sonja Grün & Stefan Rotter, Springer New York, DOI 10.1007/978-1-4419-5675-0

Workshop requirements:

The students have to bring their own laptops (running Linux, Windows, Mac or Solaris OS), preinstalled VirtualBox [www.virtualbox.org] would be helpful, and at least 10 GB of memory should be available.



Workshop 1b: Simulating large-scale spiking neuronal networks with NEST

1st Human Brain Project Flagship School, 8 - 14 Sept. 2014, Alpbach, Austria

Johanna Senk, Jochen M. Eppler, Jannis Schücker, Markus Diesmann

The neural simulation tool NEST [1, www.nest-simulator.org] is a simulator for heterogeneous networks of point neurons or neurons with a small number of electrical compartments aiming at simulations of large neural systems. It is implemented in C++ and runs on a large range of architectures from single-processor desktop computers to large clusters and supercomputers with thousands of processor cores.

With the example of the microcircuit model published by Potjans and Diesmann [2], we explain the basic modeling paradigm and features of the recently released version 2.4 of NEST. The tutorial includes an introduction to the most important neuron and synapse models as well as the routines to set up and configure the network.

It is helpful (but not required) for the tutorial if NEST or another simulator for spiking neuronal networks has been used previously and if basic knowledge about neuronal modeling in general is present.

[1] Marc-Oliver Gewaltig and Markus Diesmann (2007) NEST (Neural Simulation Tool), Scholarpedia 2 (4), p. 1430.

[2] Tobias C. Potjans and Markus Diesmann (2014) The cell-type specific cortical microcircuit: relating structure and activity in a full-scale spiking network model, Cerebral Cortex, 24:785-806, doi:10.1093/cercor/bhs358.

Workshop requirements:

The students have to bring their own laptops (running Linux, Windows, Mac or Solaris OS), preinstalled VirtualBox [www.virtualbox.org] would be helpful, and at least 10 GB of memory should be available.



Workshop 2:

How to use neuromorphic hardware

Lecturer:

Thomas Pfeil
thomas.pfeil@kip.uni-heidelberg.de

Description:

The goal of this workshop is to learn the usage of the single-chip neuromorphic Spikey system developed at the Heidelberg university [1]. This system consists of the “Spikey” chip comprising several hundred analog circuits that implement physical models of spiking neurons. Neuromorphic networks emulated by this chip run about ten thousand times faster than biological real-time. Due to its easy operation via the network description language PyNN [2], its small size, and its low power consumption the Spikey system is a good candidate for sandbox experiments. As a future perspective, a wafer-scale system is currently under development, which will be able to emulate networks containing up to several hundred thousands of neurons [3].

After a short introduction of the Spikey system and PyNN we will write our own scripts to run networks on this device. First, we will characterize the inhomogeneity in neuron and synapse parameters that arises from fluctuations in the production process. Then, we will set up simple functional networks and finally networks with spike-timing dependent plasticity [4]. Attendants are also welcome to implement their own network models on the chip.

Requirements:

We will provide remote access to the Spikey systems, which will be connected to a common server. Please bring your own notebook. To use the chips you have to establish an SSH connection to our server. Therefore, we recommend a Linux system (e.g. Ubuntu), also as a live system or virtual machine. Windows and Mac OS systems should work, too, but additional software supporting SSH connections, preferably tested with X11, may be required (e.g. Cygwin, putty etc.). Please ensure that appropriate software is installed and tested in advance of the workshop. Otherwise you will not be able to use the chips.

Further reading:

- [1] Pfeil et al (2013).
Six networks on a universal neuromorphic computing substrate (Especially Section 2)
<http://arxiv.org/abs/1210.7083>
- [2] PyNN webpage.
<http://neuralensemble.org/trac/PyNN> and
the API compatible with the Spikey system <http://neuralensemble.org/trac/PyNN/wiki/API-0.6>
- [3] Schemmel et al (2010).
A Wafer-Scale Neuromorphic Hardware System for Large-Scale Neural Modeling
<http://www.kip.uni-heidelberg.de/Veroeffentlichungen/download.php/4833/ps/2018.pdf>
- [4] Pfeil et al (2013).



*Professor Barbara J Sahakian FMedSci,
Department of Psychiatry and MRC/Wellcome Trust Behavioural and Clinical Neuroscience
Institute, University of Cambridge*

Workshop on Neuroscience and Society: The Increasing lifestyle use of smart drugs by healthy people

Psychiatric disorders are disorders of cognition. The cognitive manifestations of mental health disorders include distorted attentional biases, aberrant learning, memory impairments, dysfunctional reward systems and lack of top down cognitive control by prefrontal cortex. Cognitive enhancing drugs are needed to treat the cognitive dysfunction of disorders, including Alzheimer's disease, Attention Deficit Hyperactivity Disorder and schizophrenia. However, some of these cognitive enhancing drugs are now being used by healthy people and this lifestyle use is increasing.

Drugs such as methylphenidate (Ritalin) and modafinil (Provigil) are two of the most commonly used cognitive enhancing drugs by healthy people. They act by boosting chemicals in the brain such as dopamine and noradrenaline which improve attention, working memory, planning and problem solving as well as making tasks more pleasurable.

So why do people take these 'smart drugs'? To get a competitive edge over others: The Academy of Medical Sciences 2008 Report stated that a 10 % improvement in a memory score may lead to a higher 'A' level grade or degree class. Our study published in *Neuropharmacology* (Muller et al, 2013) suggests that healthy people also use smart drugs, like modafinil, to get down to and complete tasks that they have been putting off, because these tasks seem more enjoyable when taking these drugs. Finally, healthy people are using these drugs to stay awake and alert, and to counteract the effects of jetlag and shift-work (Sugden et al, 2012, Joint Academies Report on Human Enhancement and the Future of Work, 2012). Our recent study has shown that the drug methylphenidate acts in a similar way in the brains of adults with attention deficit hyperactivity disorder (ADHD) and healthy people. Furthermore, it improves attention in those with low performance whether they have a diagnosis of ADHD or not (del Campo et al, 2013).

People desire to enhance themselves in all sorts of ways – physically through cosmetic surgery; sexually through Viagra; and in terms of being smarter through the use of cognitive enhancing drugs. It is likely that cognitive enhancement in a globally competitive environment will be the most desirable form of enhancement.

What are the concerns about the use of these drugs? At present there are no long term safety studies of these drugs in healthy people. Furthermore, we know that the brain is in development into late adolescence. Therefore we do not know the long term consequences of the effects of these drugs on a healthy developing brain. Many students purchase these drugs via the internet, which is a very dangerous way to obtain prescription only drugs, as you do not know what you actually purchasing.

There are also many neuroethical concerns in regard to the use of 'smart drugs' by healthy people ("Ethical Considerations of Neuroscience Research", 2014). My book, 'Bad moves' discusses these in detail, including the issues of direct or indirect coercion. Now we have to ask ourselves as a society is that what we want? Will we use these drugs for the benefit of all members of society and can we preserve a good work-life balance and a sense of wellbeing?



List of Posters

- 1) Golgi apparatus structure — a study in normal brain and Alzheimer's disease
- 2) Antón Fernández A, León-Espinosa G , Aparicio-Torres G , DeFelipe J and Muñoz A
- 3) A three dimensional model for investigating the functions of brain microcircuits: The olfactory bulb
- 4) Michele Migliore, Francesco Cavarretta, Michael L. Hines, and Gordon M. Shepherd
- 5) Is cystathionine beta synthase a viable therapeutic target for acute ischemic stroke? S.J. Chan, T.W. Lim, C. Chai, S.Q. Koh, M. Yamamoto, M.K.P. Lai and P.T.H. Wong
- 6) Convergent thalamic inputs to primary and association visual areas in mice
- 7) M. Evangelio, L. Prensa, J. Rodríguez-Moreno, F. Clascá
- 8) Exploratory analysis of pathological features in Alzheimer's disease
- 9) Diana Furcila, Juan Morales, Gonzalo León-Espinosa, Ángel Rodríguez , Javier DeFelipe and Lidia Alonso-Nanclares
- 10) The socio-economic implications of artificial intelligence for education: An exploratory study
- 11) Jovana Gjorgjioska
- 12) The neuroprotective effect of granulocyte-colony stimulating factor and dizocipiline in partial global cerebral ischemia. Dibbanti HariKrishnaReddy, BaldeepKumar, Ajay Prakash, A Chakrabarti, KL Khanduja, Biman Saikia, Bikash Medhi
- 13) On autopoiesis of intentionality
- 14) Léon Homeyer
- 15) Large-scale host interface for wafer-scale neuromorphic hardware
- 16) Vitali Karasenko
- 17) A CUDA Port for Neural Simulation Tool(NEST)
- 18) Engin Kayraklioglu, Tarek El-Ghazawi
- 19) Multi-electrode array recordings of nucleus accumbens in cocaine conditioned C57BL/6 mice
- 20) Kummer, K.K., Kress, M., Saria, A., and Zernig, G.
- 21) Hybrid parallelization of a seeded region growing segmentation of brain images for a GPU cluster
- 22) Anna Maria Lührs, Dr. Markus Axer, Oliver Bückner, Prof. Dr. Johannes Grotendorst
- 23) Extending the mind: A review of ethnographies of neuroscience practice
- 24) Tara Mahfoud
- 25) RetiMap: A simulation platform of retinotopic maps in the visual system
- 26) Martínez Cañada, P., Morillas Gutiérrez, C.A., Del-Pino Prieto, M.B., Romero García, S.F., Ros Vidal, E., Pelayo Valle, F.J.
- 27) A real-time spiking cerebellum model for robot control
- 28) Francisco Naveros, Niceto R. Luque, Jesús A. Garrido, Richard R. Carrillo, Eduardo Ros
- 29) Measuring impacts and outcomes in technology assessment research centres



- 30) Michael Reinsborough
- 31) Indications of higher-order correlations in pairwise population measures
- 32) Vahid Rostami, Junji Ito , Moritz Helias and Sonja Grün
- 33) Distribution of synapses on dendritic spines and shafts in the rodent somatosensory cortex
- 34) Santuy, A., Rodríguez, J.R., DeFelipe, J., Merchán-Pérez, A.
- 35) B - Amyloid plaque in Human Immunodeficiency Virus (HIV)
- 36) Asli Semerci, Özge Sönmezler
- 37) From randomly connected to spatially organized cortical networks
- 38) Johanna Senk, Espen Hagen, Sacha van Albada, Markus Diesmann
- 39) Data clustering with coherence analysis in prodromal AD and dementia diagnosis
- 40) P. Bosco, A. Chincarini, L. Rei, F. Sensi, I. Solano, G. Gemme, S. Squarcia, R. Longo, R. Bellotti
- 41) Constructing a library of domain knowledge for process-based modeling of neurons using the Hodgkin-Huxley formalism
- 42) Nikola Simidjievski, Ljupco Todorovski, Sašo Džeroski
- 43) Automated process-based modeling and design of dynamic biological systems
- 44) Jovan Tanevski, Ljupco Todorovski, Sašo Džeroski
- 45) Robotic implementation of an artificial cerebellum based on neural plasticity models
- 46) Lorenzo Vannucci
- 47) Reinforcement learning signals of social influence on human decision-making
- 48) Lei Zhang, Jan Gläscher

Student Lecture Chairs

Speaker	Student
Paolo Bosco, Alberto Redolfi	Tara Mahfoud
Markus Diesmann	Léon Homeyer
Simon Eickhoff	Alejandro Antón Fernández
Richard Frackowiak	Jovan Tanevski
Sonja Grün	Jovana Gjorgjioska
David Lester	Anna Maria Lührs
Abdul Mohammed	Francisco Naveros Arrabal
Francesco Pavone	Lei Zhang
Mihai Petrovici	Iulia Diana Furcila
Wolfram Schenck	Sebastian Porsdam Mann