HBP

The Human Brain Project

Madrid, June 20th 2013

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Proposal Preparation

August, 2010

HBP-PS Proposal

(FP7-ICT-2011-FET-F)
December, 2010

HBP-PS (CSA)

May, 2011

HBP Report

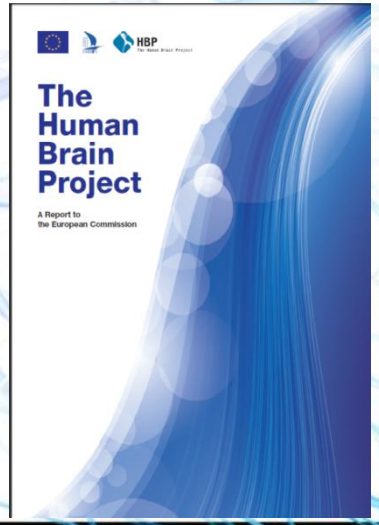
April, 2012

HBP Ramp-up

mid 2013-end 2015

(FP7-ICT-2013-FET-F, CP-CSA, Jul-Oct, 2012

HBP FULL-SCALE



PROJECT FICHE:

PROJECT TITLE: HUMAN BRAIN PROJECT

COORDINATOR: EPFL (Switzerland)

COUNTRIES: 23 (EU MS, Switzerland, US, Japan, China); 22 in Ramp Up Phase.

RESEARCH LABORATORIES: 256 in Whole Flagship; 110 in Ramp Up Phase

RESEARCH INSTITUTIONS (Partners):
- 150 in Whole Flagship
- 82 in Ramp Up Phase & New partners through Competitive Call Scheme (15,5% of budget)
- 200 partners expected by Y5 (Project participants & New partners through Competitive Call Scheme)

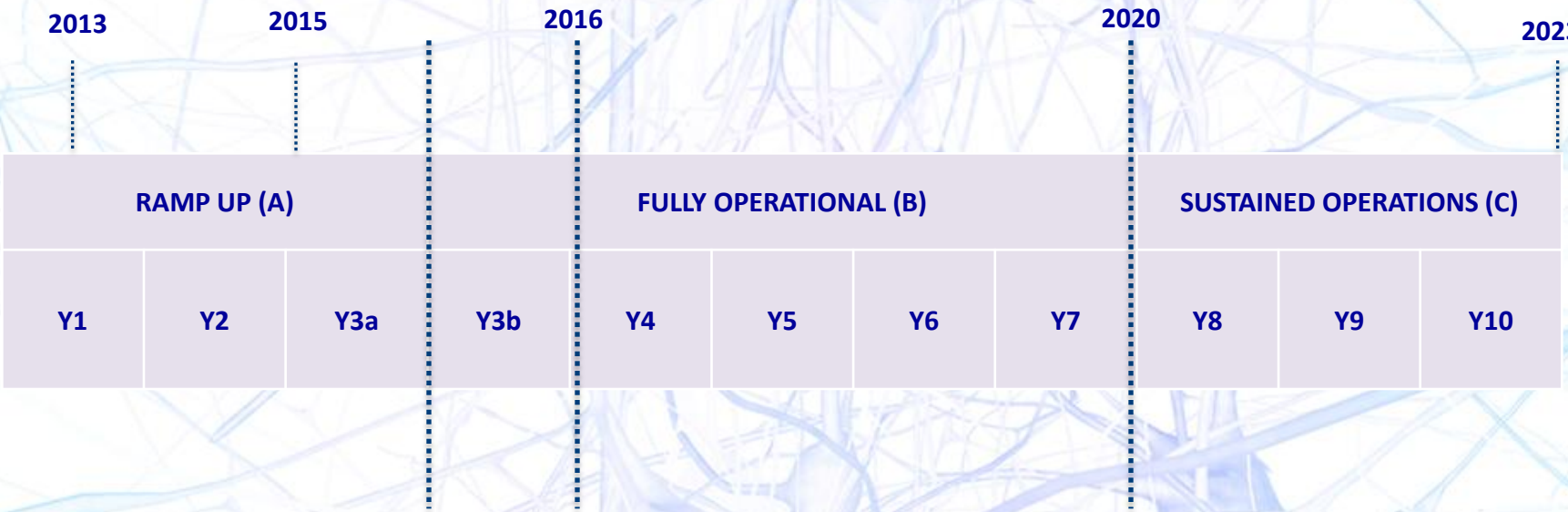
DIVISIONS:11

SUBPROJECTS: 13

TOTAL COSTS: 1.000* M€; 72,7 M€ in Ramp Up Phase

* 1160 M€ Project Total Costs (October, 2012)

Main Scheme of The Human Brain Project: HBP Phases



HBP Structure

HBP: 11 DIVISIONS; 13 SUBPROJECTS (10 SCIENTIFIC & APPLICATIONS & ETHICS & MGT)

DIVISION	SPN[1]	SUBPROJECTS	AREA OF ACTIVITY
MOLECULAR & CELLULAR NEUROSCIENCE	SP1	STRATEGIC MOUSE BRAIN DATA	
COGNITIVE NEUROSCIENCE	SP2	STRATEGIC HUMAN BRAIN DATA	DATA
	SP3	BRAIN FUNCTION	
THEORETICAL NEUROSCIENCE	SP4	THEORETICAL NEUROSCIENCE	THEORY
NEUROINFORMATICS	SP5	THE NEUROINFORMATICS PLATFORM	
BRAIN SIMULATION	SP6	BRAIN SIMULATION PLATFORM	
HIGH PERFORMANCE COMPUTING (HPC)	SP7	HPC PLATFORM	PLATFORMS
MEDICAL INFORMATICS	SP8	MEDICAL INFORMATICS PLATFORM	
NEUROMORPHIC COMPUTING	SP9	NEUROMORPHIC COMPUTING PLATFORM	
NEUROROBOTICS	SP10	NEUROROBOTICS PLATFORM	
	SP11	APPLICATIONS	APPLICATIONS
ETHICS & SOCIETY	SP12	ETHICS & SOCIETY PROGRAMME	ETHICS
MANAGEMENT	SP13	PROGRAMME & PROJECT MANAGEMENT	MANAGEMENT

[1]SPN: Subproject Number

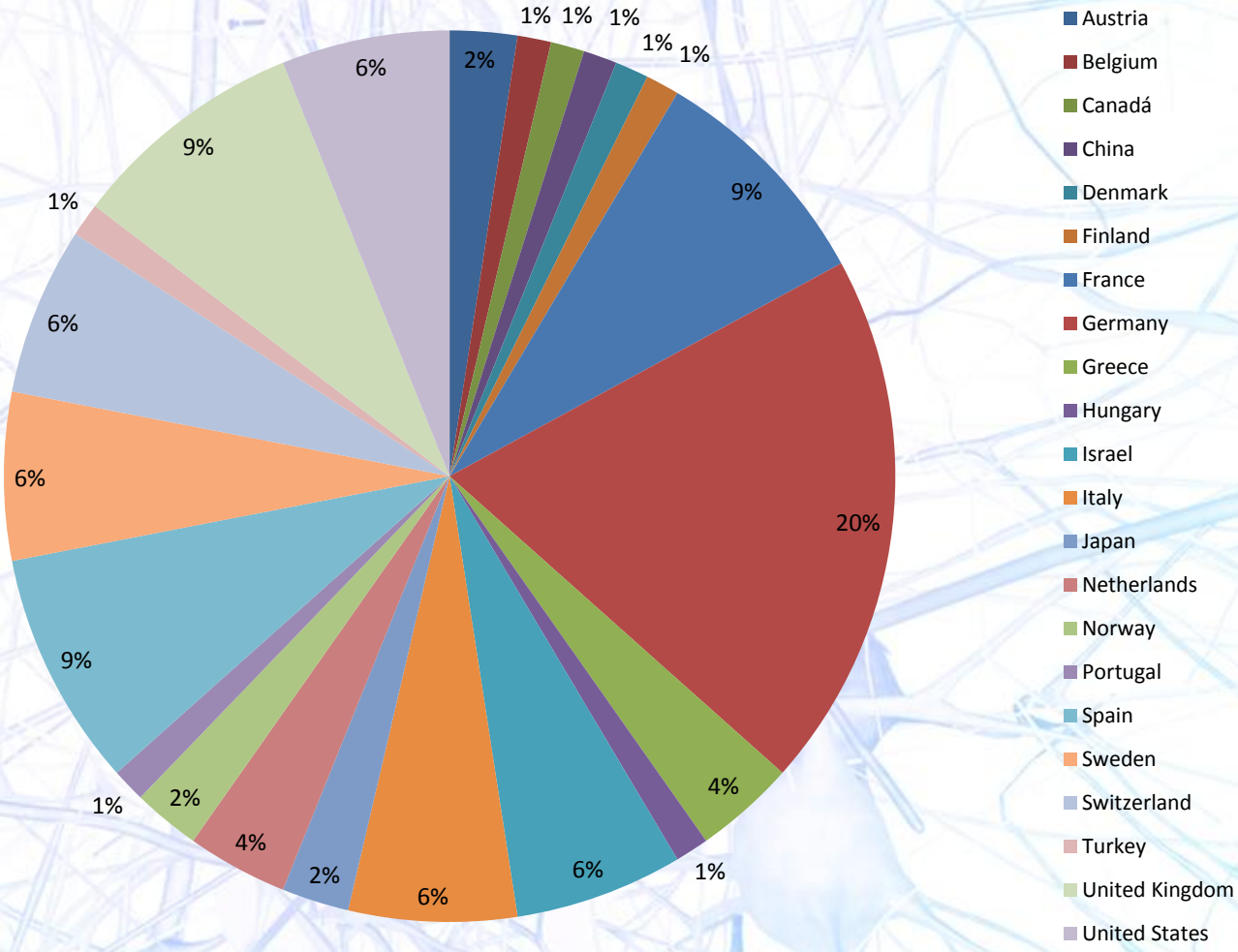
HBP Structure

DN[1]	SPN[2]	SUBPROJECTS	LEADER/S	COUNTRY
D1	SP1	STRATEGIC MOUSE BRAIN DATA	Javier DeFelipe & Seth Grant	ES / UK
	SP2	HUMAN BRAIN DATA	Katrin Amunts	DE
D2	SP3	BRAIN FUNCTION	Stanislas Dehaene	DE
D3	SP4	THEORETICAL NEUROSCIENCE	Alain Destexhe & Wulfram Gerstner	FR/CH
D4	SP5	NEUROINFORMATICS	Sten Grillner	SE
D5	SP6	BRAIN SIMULATION	Henry Markram & Jeanette Hellgren-Kotaleski	CH
D6	SP7	HPC	Thomas Lippert	DE
D7	SP8	MEDICAL INFORMATICS	Richard Frackowiak & Anastasia Ailamaki	CH
D8	SP9	NEUROMORPHIC COMPUTING	Karlheinz Meier & Steve Furber	DE / UK
D9	SP10	NEUROROBOTOCS	Alois Knoll	DE
	SP11	APPLICATIONS	Karlheinz Meier	DE
D10	SP12	ETHICS & SOCIETY	Jean-Pierre Changeux & Kathinka Evers	FR / SE
D11	SP13	MANAGEMENT	Henry Markram	CH

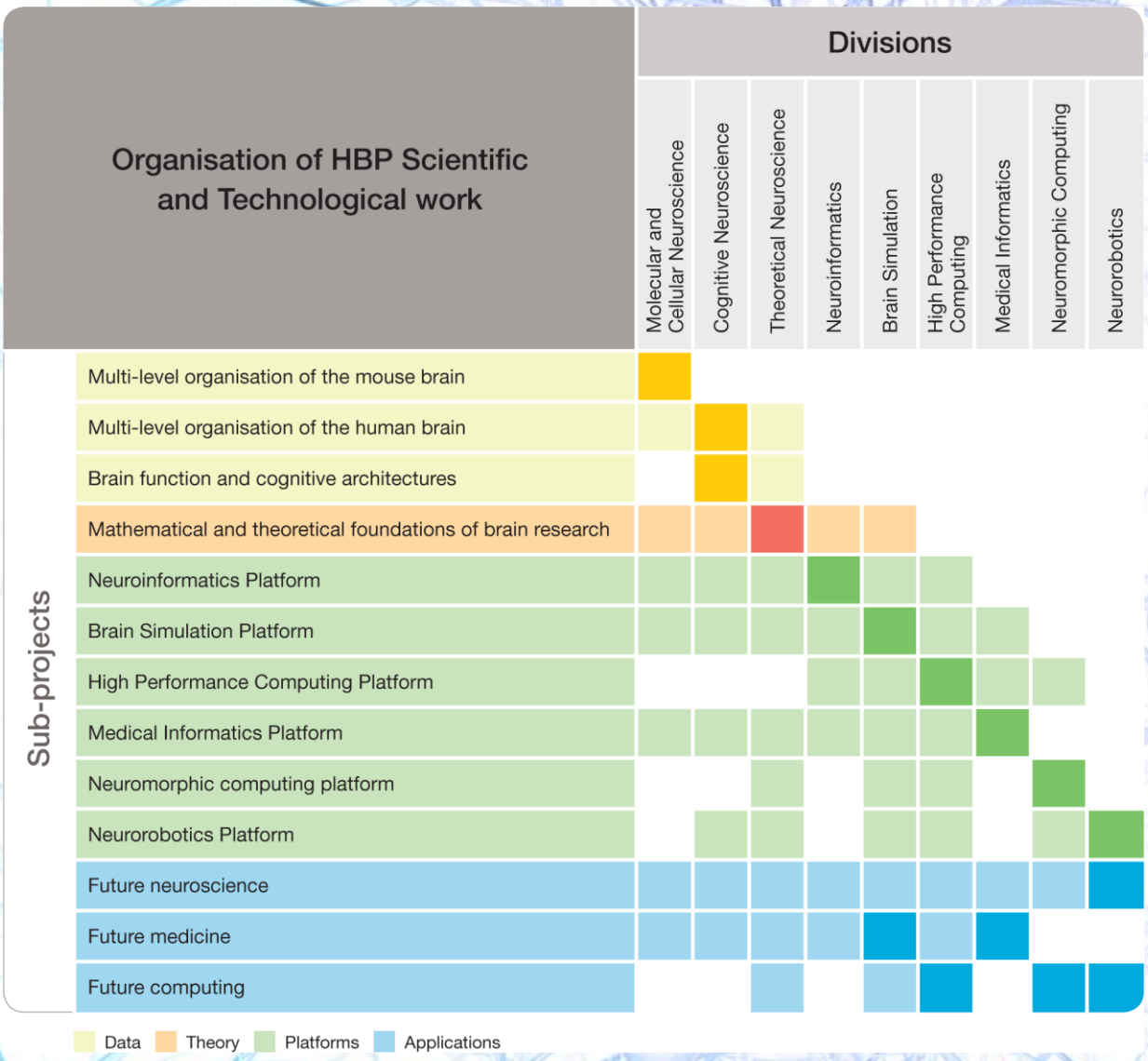
[1]DN: Division Number; [2]SPN: Subproject Number

HBP Countries

Countries	Organization/s
Austria	2
Belgium	1
Canadá	1
China	1
Denmark	1
Finland	1
France	7
Germany	16
Greece	3
Hungary	1
Israel	5
Italy	5
Japan	2
Netherlands	3
Norway	2
Portugal	1
Spain	7
Sweden	5
Switzerland	5
Turkey	1
United Kingdom	7
United States	5
22	**82**



Scientific organization



The HBP's nine scientific divisions will work together to:

- Collect and organize ***data***
- Build six ICT ***platforms*** open to the scientific community
- Exploit the platforms for new ***applications*** in
  - *Neuroscience*
  - *Medicine*
  - *Future Computing*

• Dark shaded areas represent responsibilities for work packages;
• Light shaded areas show contributions to the work programme

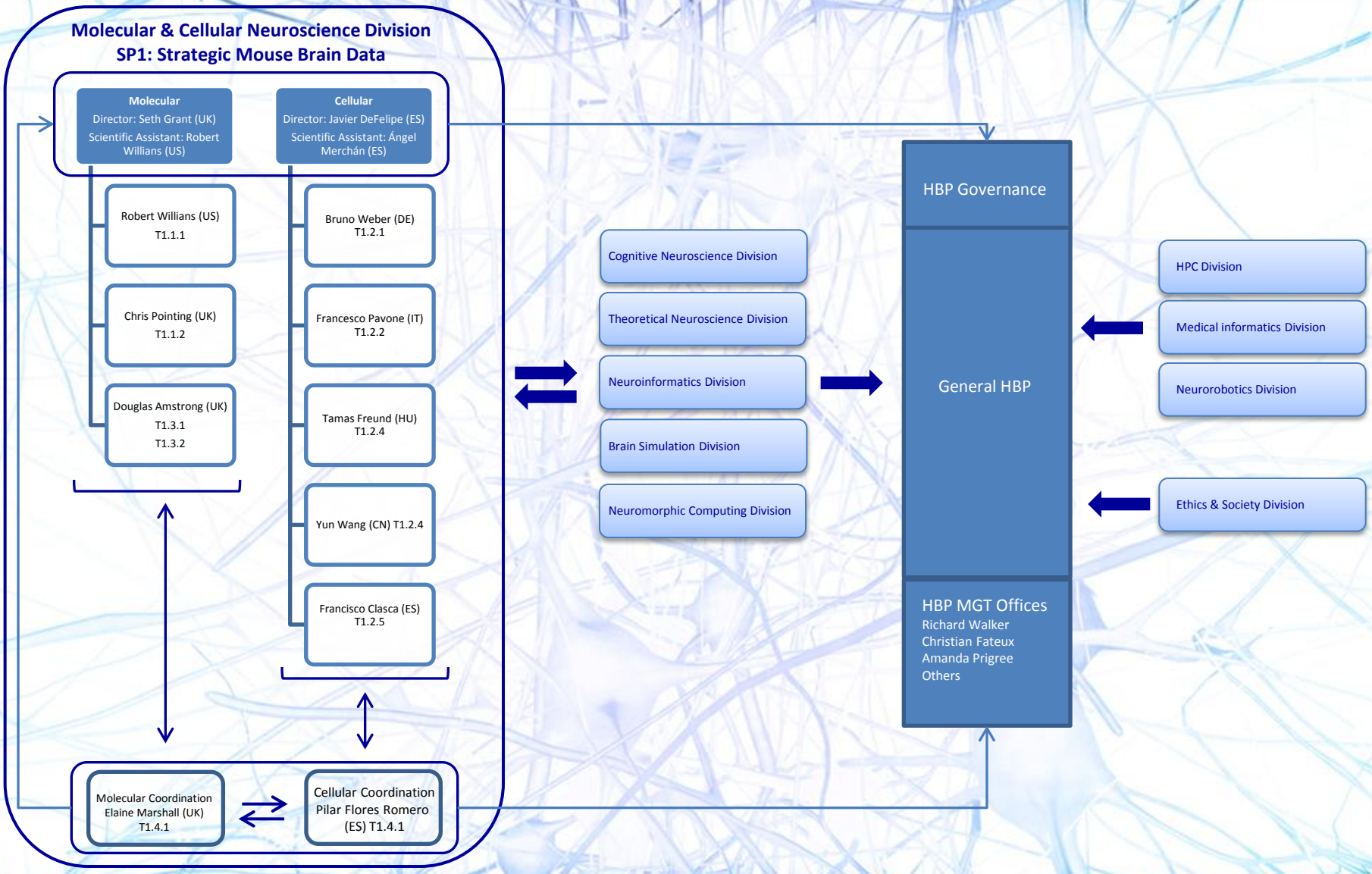
Subproject organization

HBP-SP1 GENERAL SCHEME

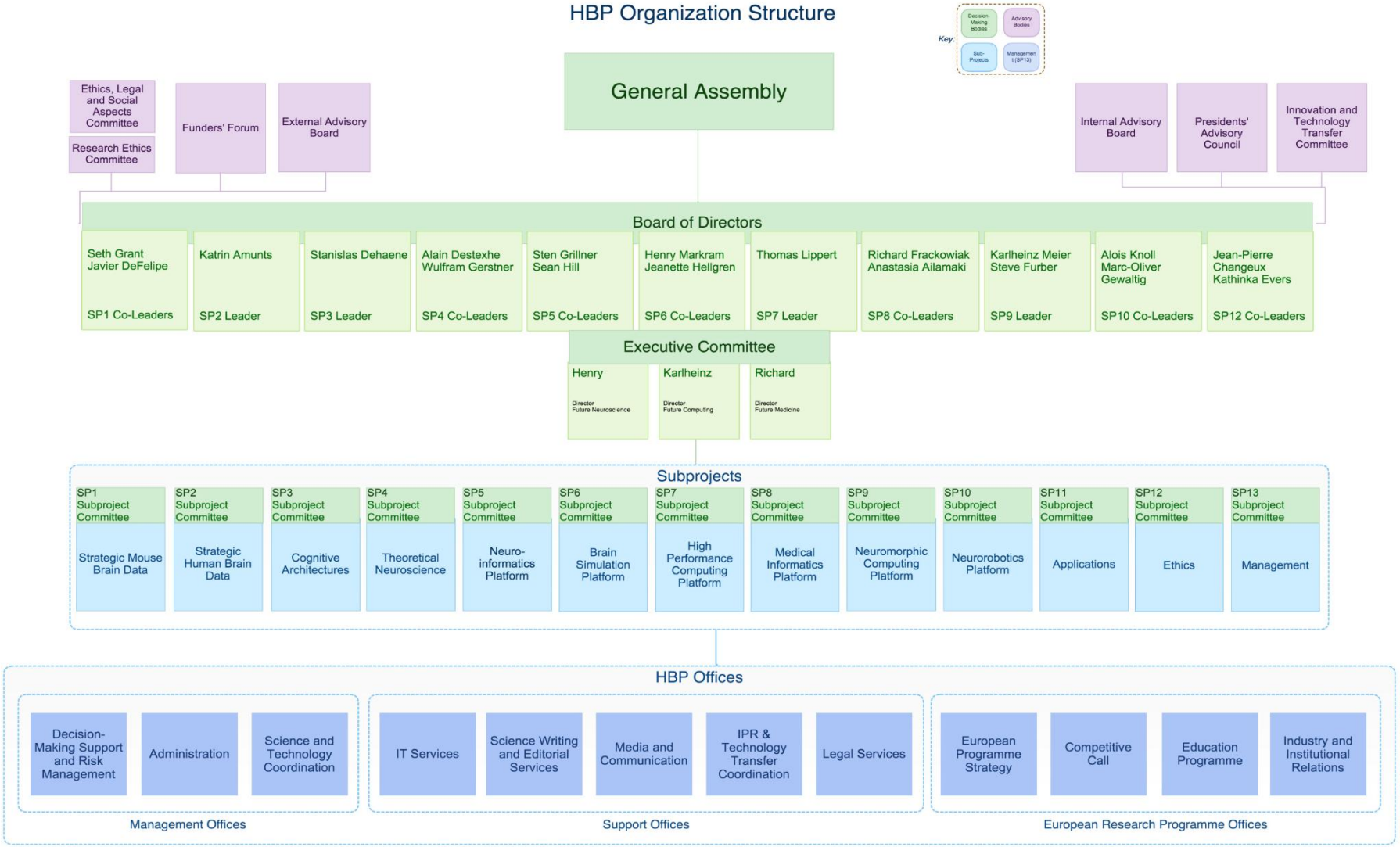
SP:
WPs:
Tasks
Deliverables
Milestones

Molecular & Cellular Neuroscience Division		
SP1 - Strategic Mouse Brain Data		
WP1.1 - Mouse brain transcriptomics and proteomics		**Leader**
Seth Grant	**Uni. Edinburgh**	
T1.1.1	Cell-type expressing transgenic mice	Robert Williams
T1.1.2	Profiling the transcriptome of different cell types	Chris Ponting
T1.1.3	The cellular and synaptic proteome	Seth Grant
WP1.2 - Mouse brain macrostructure, vasculature, cells and synapses		
Javier Defelipe	**UPM**	
T1.2.1	Detailed anatomical map of brain vasculature	Bruno Weber
T1.2.2	Whole brain cell distributions	Francesco Pavone
T1.2.3	Numbers and distributions of excitory and inhibitory neurons and glia	Javier DeFelipe
T1.2.4	Morphological analysis of neurons and glia	Yun Wang
		Tamas Freund
T1.2.5	Principles of axonal projections	Francisco Clasca
T1.2.6	Synapse Map of the Mouse Brain	Javier DeFelipe
WP1.3 - Data aggregation, analysis, and dissemination		
Douglas Armstrong	**Uni. Edinburgh**	
T1.3.1	Deposit data in the HBP mouse brain atlas	Douglas Armstrong
T1.3.2	Data sources and tools for molecular and cellular informatics	Douglas Armstrong
WP1.4: Strategic Mouse Brain Data: scientific coordination		
Javier DeFelipe	**UPM**	
T1.4.1	Scientific coordination and support	Javier DeFelipe
		Seth Grant

SP1 General Scheme



Management and Organization Structure



HBP Budget

HBP TOTAL COSTS (RU Phase 36 months):

RAMP UP (A)		
Y1	Y2	Y3

72.7 M€

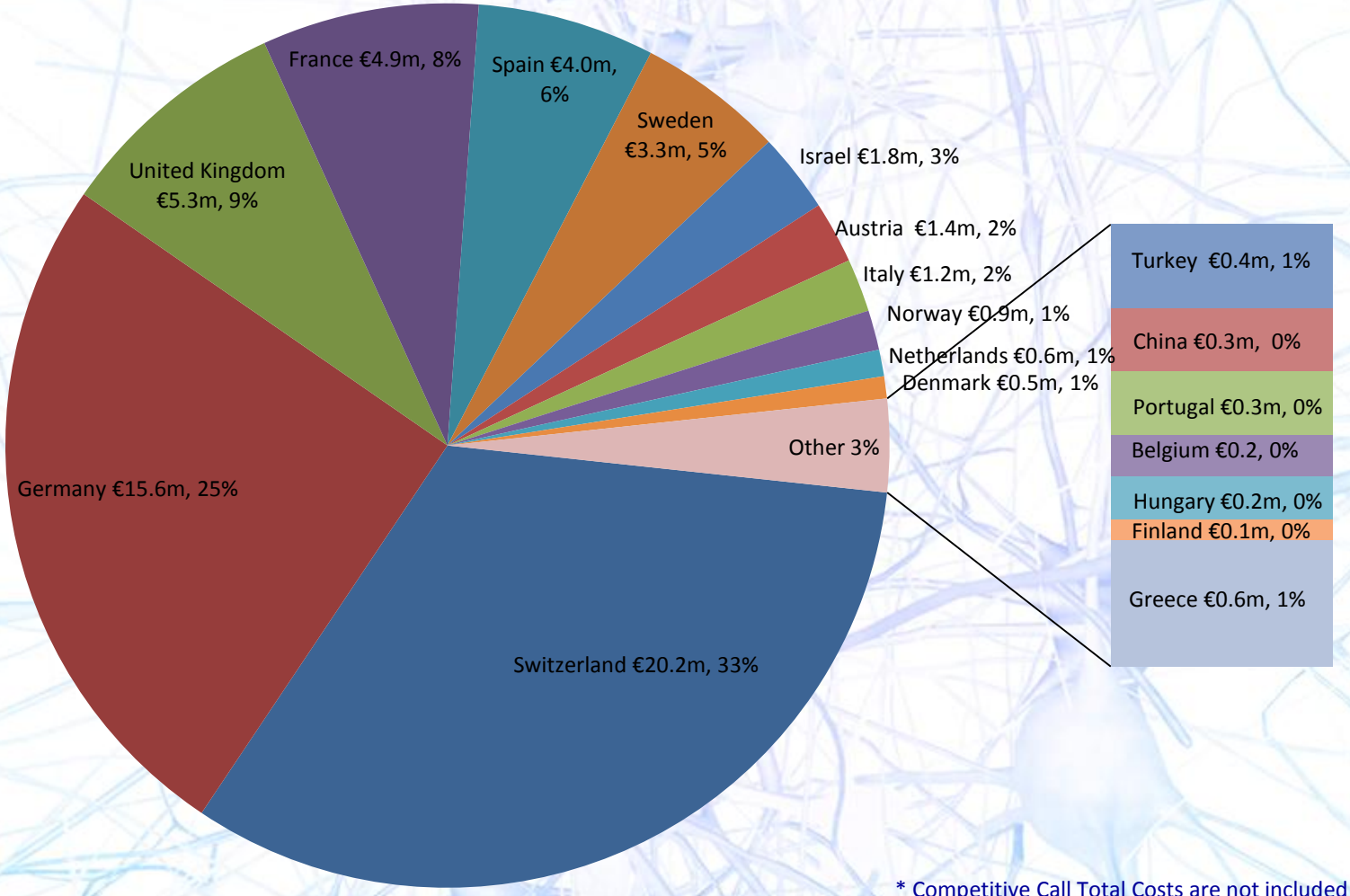
7 % of the Total Costs

PROJECT TOTAL COSTS: 72.7 M€

- **EU funding: 74.3 % (54M€)**
- **Partners Funding: 25.7 % (18.7 M€)**

HBP Budget

Total Cost breakdown by country (RU):



* Competitive Call Total Costs are not included

HBP Industry

INDUSTRIAL PARTNERS (IP):

- IP will pilot the use of the platforms for applications development
- IP will come mainly in the operational phase
- IP involved in the RU: SAP GA, Germany (SP11 Applications: Future Computing)
- Others in the RU can be joined the consortium through the competitive call

- SMEs that have expressed their intention to contribute to the HBP in the operational phase:

3H Biomedical AB, Sweden	Advanced Neuro Technology BV, Netherlands
Arivis GmbH, Germany	Artica Telemedicina S.L., Spain
B'SYS GmbH, Switzerland	Brain Products GmbH, Germany
CLC bio A/S, Denmark	Thomas Recording GmbH, Germany
Delta Phenomics BV, Netherlands	eemagine Medical Imaging Solutions GmbH, Germany
g.tech - GUGER Technologies OEG, Austria	JSW Life Science GmbH, Austria
Nanion Technologies GmbH, Germany	Neuro Zone, Italy
Noldus Information technology BV, Netherlands	Pharnext, France
Psynova Neurotech Ltd., UK	Sensapex Ltd., Finland
STAB VIDA Lda, Portugal	STARLAB Barcelona S.L., Spain
Centre Suisse d'Electronique et de Microtechnique (CSEM), Switzerland	

HBP Competitive Call

COMPETITIVE CALL

• Main goal: to involve groups and countries that are not represented in the original HBP Consortium.

• The Call will be designed to complement the collective skills of the Consortium with additional expertise and resources needed to reach its scientific objectives.

• Once selected, applicants will become full partners of the project and be integrated in subprojects of the Work Plan.

• Budget: 15,5 % of the total budget (Eur 11.1 million)

• The call will cover **seven specific themes:**

- ✓ Mouse and human channelomics and receptomics (SP1)
- ✓ Genotype to phenotype mapping of the mouse brain (SP1)
- ✓ Identifying, gathering and organizing human neuroscience data (SP2-3)
- ✓ Cognitive architectures (SP3-4)
- ✓ Novel methods for rule-based clustering of medical data (SP8)
- ✓ Neuromorphic implementation of cognitive architectures(SP9)
- ✓ Virtual robotic environments, agents, sensory & motor systems (SP10)

Spanish Participation (RU)

Short Name	Official Name
UPM	Universidad Politécnica de Madrid
UAM	Universidad Autónoma de Madrid
Uni. Barcelona	Universidad de Barcelona
Uni. Granada	Universidad de Granada
UPF	Universidad Pompeu Fabra
BSC-CNS	Barcelona Supercomputing Center-Centro Nacional de Supercomputación
URJC	Universidad Rey Juan Carlos

Spanish Participation:
7 Research Institutions (8.5%)
10 Research laboratories (9 %)

Spanish Participation (RU)

DIVISION	SPN[1]	SUBPROJECTS	Spanish Participation	Role
MOLECULAR & CELLULAR NEUROSCIENCE	SP1	STRATEGIC MOUSE BRAIN DATA	✓	DL, SPL, WPL, TL, TC
COGNITIVE NEUROSCIENCE	SP2	STRATEGIC HUMAN BRAIN DATA	✓	TC
	SP3	BRAIN FUNCTION	✓	TC
THEORETICAL NEUROSCIENCE	SP4	THEORETICAL NEUROSCIENCE	✓	WPL,TL
NEUROINFORMATICS	SP5	THE NEUROINFORMATICS PLATFORM	✓	WPL, TL
BRAIN SIMULATION	SP6	BRAIN SIMULATION PLATFORM	-	-
HIGH PERFORMANCE COMPUTING (HPC)	SP7	HPC PLATFORM	✓	TL
MEDICAL INFORMATICS	SP8	MEDICAL INFORMATICS PLATFORM	-	-
NEUROMORPHIC COMPUTING	SP9	NEUROMORPHIC COMPUTING PLATFORM	-	-
NEUROROBOTICS	SP10	NEUROROBOTICS PLATFORM	-	-
	SP11	APPLICATIONS	✓	TC
ETHICS & SOCIETY	SP12	ETHICS & SOCIETY PROGRAMME	-	-
MANAGEMENT	SP13	MANAGEMENT	✓	C

[1]SPN: Subproject Number

Roles[1]

DL	Division Leader
SPL	Subproject leader
WPL	WP leader
TL	Task Leader
TC	Task Collaborator

Spanish Participation

Spanish Participation in brief

- ✓ **Spanish Organizations (Whole Flagship):** 13 (8,6 %)
- ✓ **Spanish Research Laboratories (Whole Flagship)**: 26 (10 %)
- ✓ **Spanish Organizations (Ramp Up Phase):** 7 (8,5 %)
- ✓ **Spanish Roles[1]:** DL, SPL, WPL; TL & TC
- ✓ **Spanish budget in Ramp Up Phase**: 6 % (included within the five largest beneficiaries)
- ✓ **Spanish budget in Whole Flagship**: 7 %* (included within the five largest beneficiaries)

Roles[1]	
DL	Division Leader
SPL	Subproject leader
WPL	WP leader
TL	Task Leader
TC	Task Collaborator

* Estimated figure

The Human Brain Project

http://www.humanbrainproject.eu/

Madrid, June 20th 2013
Cajal Cortical Circuits Laboratory (UPM-CSIC)