










## Report of the EBRAINS Research Infrastructure Voucher Programme (D7.4 - SGA3)

<div style="display: flex; justify-content: space-between; align-items: center;">  <div> <p><b>Human Brain Project</b></p> <p>EBRAINS Research Infrastructure Voucher Call 2020</p> </div>  </div> <div style="margin-top: 20px;"> <p><b>Scope</b></p> <p>Apply for a voucher to get free access to the EBRAINS Infrastructure Services and engineering support. Each voucher is estimated to provide you with 4-12 person months of HBP engineering time.</p> <p>The call is open to researchers worldwide, academic, non-academic, from medical research including hospitals, and industry including pharmaceuticals, diagnostics and medical devices.</p> <p>Neither the applicants nor the associated groups are currently funded by HBP.</p> </div> <div style="margin-top: 20px;"> <p><b>Benefits for voucher winners</b></p> <p>Receive tailor-made solutions developed by the EBRAINS Infrastructure engineering teams and advance your research.</p> <p>Collaborate and exchange with the HBP scientific and technical network (there is a travel budget reserved for you).</p> <p>Lay the ground for longer-term successful partnerships, especially if you are a researcher or an expert from industry or pharma, and become a Partnering Project.</p> <p>Gain visibility as voucher winner via the HBP network and dissemination activities.</p> <p>Consult the HBP Innovation Team which offers expertise in the crossover area of ICT, neuroscience and the biomedical sector.</p> </div> <div style="margin-top: 20px;"> <p><b>Please note</b></p> <p>While benefitting from tailor-made developments and solutions, voucher winners do not receive any direct funding from the HBP.</p> </div> <div style="margin-top: 20px;"> <p><b>Next steps</b></p> <p>Please get in contact with the HBP and discuss your feature request, before the submission deadline. Contacts are provided in the "Guide for Applicants".</p> <p>Note: Your EBRAINS developer contact will contribute to the proposal after the external submission deadline on 6 Nov 2020.</p> </div>	<div style="display: flex; justify-content: space-between; align-items: center;">  <div> <p>Co-funded by the European Union</p>  </div> </div> <div style="margin-top: 10px;"> <p><b>Application process</b></p> </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p style="text-align: center; background-color: #333; color: white; padding: 5px;"><b>Before Applying:</b></p> <p style="text-align: center; background-color: #00aaff; color: white; padding: 5px;"><b>ELIGIBILITY CHECK</b></p> <div style="display: flex; justify-content: space-around; align-items: center; background-color: #e0f2f1; padding: 5px;"> <div style="text-align: center;"> <input checked="" type="checkbox"/> I have a suggestion for a useful EBRAINS feature         </div> <div style="text-align: center;"> <input checked="" type="checkbox"/> I am a researcher, academic, non-academic, including medical research, or industry and pharma         </div> <div style="text-align: center;"> <input checked="" type="checkbox"/> Neither myself nor my group is funded by HBP         </div> </div> <p style="text-align: center; margin-top: 10px;">Contact the HBP and discuss your feature request</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>1</p> <p style="background-color: #f44336; color: white; padding: 5px; border-radius: 5px;">Start now</p> </div>  </div> <p style="text-align: center; margin-top: 10px;">Upload the completed proposal to the Open Calls Platform by 6 Nov 2020, 17:00 Brussels time</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>2</p> <p style="background-color: #f44336; color: white; padding: 5px; border-radius: 5px;">6 Nov 2020</p> </div>  </div> <p style="text-align: center; margin-top: 10px;">EBRAINS Infrastructure contact(s) complete their part of the proposal and upload it to the Open Calls Platform by 30 Nov 2020, 17:00 Brussels time</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>3</p> <p style="background-color: #f44336; color: white; padding: 5px; border-radius: 5px;">30 Nov 2020</p> </div>  </div> <p style="text-align: center; margin-top: 10px;">Announcement of winners</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>4</p> <p style="background-color: #f44336; color: white; padding: 5px; border-radius: 5px;">Feb 2021</p> </div>  </div> </div> <div style="margin-top: 20px;"> <p>Link on <a href="http://www.humanbrainproject.eu/en/collaborate/open-calls/">www.humanbrainproject.eu/en/collaborate/open-calls/</a></p> <p>Call site with "Guide for Applicants" and "Proposal Template"</p> <p>Open Calls Platform login</p> <p>Contact &amp; feedback: vouchers@humanbrainproject.eu</p> </div> <div style="text-align: right; margin-top: 10px;">  </div>
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**Figure 1: Call flyer for dissemination**

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<b>Description in GA:</b>	This Deliverable will provide an overview of the management of the EBRAINS research infrastructure voucher programme for SGA3. It will include the description of the entire process, starting from the preparation of the call documents to the evaluation of the proposals. It will also include the information on the new projects selected for implementation.
<b>Abstract:</b>	Report on the EBRAINS Research Infrastructure Voucher Programme Call 2020 in SGA3
<b>Keywords:</b>	EBRAINS, Research Infrastructure, Vouchers, Partnering Projects, Voucher proposals, Human Brain Project, EBRAINS Service Categories, Implementation and New Applications for the External Community
<b>Target Users/Readers:</b>	All interested in EBRAINS features and high-level use cases: clinicians, computational neuroscience community, computer scientists, Consortium members, funders, general public, HPC community, neuroimaging community, neuro-informaticians, neuroscientific community, neuroscientists, Platform users, policymakers, researchers, scientific community

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# 1. Purpose of this document

The [EBRAINS](https://ebrains.eu/)<sup>1</sup> research infrastructure Vouchers are designed to enable non-HBP researchers to secure HBP engineering solutions for their challenging scientific and technical problems via co-development of new research infrastructure capabilities.

This document describes the procedure and results of the SGA3 EBRAINS Research Infrastructure Voucher Programme Call 2020. The results are compared to the former 2019 Call.

The Call involved the following principal steps:

- Development of Call concept and internal validation of Call concept & documentation
- Opening of the Call and dissemination to prospective applicants
- Receipt of proposals, evaluation procedure and Call results

# 2. Concept and internal validation of the EBRAINS Research Infrastructure Voucher Programme Call

The Vouchers fund work undertaken by EBRAINS engineering teams to implement research infrastructure features requested by Voucher recipients. An individual Voucher is worth between 4-12 Person Months (PMs) of HBP software engineering or development time and includes a travel budget to allow in-person interaction between HBP engineers and scientists in receipt of Vouchers.

The Vouchers are an incentive for the scientific community to co-design the EBRAINS research infrastructure and collaborate with the Project. Voucher winners are integrated as new [Partnering Projects](#)<sup>2</sup> and thereby expand the overall HBP FET Flagship. The Voucher programme therefore helps to make the HBP more open and responsive to the needs of the broader scientific community.

The researchers in Voucher projects are considered as senior users, capable of providing valuable feedback on the expectations and needs of different scientific communities, in neuroscience, brain simulation, brain-inspired and high-performance computing, neurorobotics and medical informatics. The new users will not only drive the creation of new RI features, applications and services, but also help to ensure their usability, accessibility and performance, by serving as the initial testers of these new additions to the infrastructure.

With EBRAINS engineering support, selected projects are expected to generate unique results that have the potential to lead to innovative new products, services and processes of mutual long-term benefit for European researchers.

The main principles of the Call were:

The Call was open worldwide to target researchers in academic and non-academic organisations, as well as hospitals and industry, including the pharmaceutical sector. HBP members were not eligible.

Potential applicants were required to discuss their ideas for new infrastructure features with HBP experts during the proposal preparation phase, before submission of any formal proposal. This allowed HBP engineers and potential applicants to discuss the feasibility and relevance of the infrastructure capabilities being sought.

The number of applications that an EBRAINS contact (PI and respective lab) could co-submit was limited to two. This was new compared to the 2019 Call.

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<sup>1</sup> <https://ebrains.eu/>

<sup>2</sup> <https://www.humanbrainproject.eu/en/about/project-structure/partnering-projects/>

The evaluation criteria were adapted to the ones of the HBP SGA3 Calls for Expression of Interest, which led to a shift of the “Innovation” criterion to the “Impact” criteria section and the addition of the new criterion “Equal Opportunities”. This was also a new feature compared to the 2019 Call.

The concept for the Call and the related documents were validated by the HBP Directorate before the Call was opened.

Please see the [Call flyer in Figure 1](#)<sup>3</sup> and the “[Guide for Applicants](#)”<sup>4</sup> for more information.

### 3. Opening and dissemination

The Call was opened on 18 September 2020 on the HBP’s Open Call Platform site<sup>5</sup>, which was used to manage the applications.

The Call was explained to the Work Package Managers via bi-weekly meetings between the Project Coordination Office and the Work Package Managers. The Work Packages supported the dissemination of the Call documents to target audiences outside the HBP.

The Voucher Call was announced on the HBP website and was posted on the HBP Twitter and LinkedIn channels, maintained by the communication team and local Work Package communicators: e.g. <https://twitter.com/HumanBrainProj> and <https://twitter.com/HBPBrainSim>. The Call was also distributed through the Géant blog and several university newsletters (e.g. at Heidelberg University, University of Innsbruck, Research Centre Jülich, University of Oslo, etc.).

Additionally, the Call was distributed to the list of the National Contact Points (NCP) for Health and Information and Communications Technology and via the HBP Education Programme Newsletter. Furthermore, the Call announcement was distributed via the HBP Innovation Team (UPM) and the Partnering Project networks (EPFL).

The programme Call flyer was disseminated by the HBP Education and Outreach Team (MUI) at:

- European Research and Innovation Days, HBP booth at the “Science is wonderful!” exhibition, 22-24 Sep 2020 <https://www.humanbrainproject.eu/en/follow-hbp/events/european-research-and-innovation-days/>
- Virtual booth at the Bernstein Conference, 29 Sep-2 Oct 2020 <https://www.humanbrainproject.eu/en/follow-hbp/events/bernstein-conference-online/>

### 4. Receipt of proposals, evaluation procedure and call results

The deadline for submission of the completed proposals was on 6 November 2020.

By that date, the Call had received 15 eligible proposals. Proposal evaluation was performed in two steps:

- 1) All submitted proposals were independently evaluated by three external experts from the relevant research fields.
- 2) The experts discussed and compared all proposals during a virtual panel meeting and established the final ranking of the proposals, providing a list of proposals being above and below the threshold.

<sup>3</sup> [https://sos-ch-dk-2.exo.io/public-website-production/filer\\_public/43/66/43666c48-743b-47ed-90bd-35cf44860a54/voucher-call-2020-flyer.pdf](https://sos-ch-dk-2.exo.io/public-website-production/filer_public/43/66/43666c48-743b-47ed-90bd-35cf44860a54/voucher-call-2020-flyer.pdf)

<sup>4</sup> <https://opencalls2.humanbrainproject.eu/call/filePreview/129>

<sup>5</sup> The Open Call Platform (<https://www.humanbrainproject.eu/en/collaborate/open-calls/>) contains procedural documentation for Calls which are currently open and provides an overview of past HBP Calls. The Research Infrastructure Voucher Programme Call described in this Deliverable is closed.

The ranked list of the proposals was presented to and endorsed by the HBP Science and Infrastructure Board (SIB) and the Directorate (DIR). The results of the evaluations were also shared with the European Commission.

13 proposals were awarded an EBRAINS Research Infrastructure Voucher.

## 4.1 Overview

Table 1 shows the overview of the submitted versus awarded proposals in numbers for 2020 as compared with those for the 2019 Call (listed in parenthesis).

In comparison to the 2019 Call, the number of proposals received was lower. One reason could be that the HBP had opened in parallel five Calls for Expression on Interest, so that there was a competitive effect with regard to the number of potential applicants and the visibility of the announcement.

Overall, the 2019 Call had a greater number of applications, institutions and the number of person months applied for. However, the 2020 Call had a larger number of companies, countries and female PIs than the previous Call. Compared to the 2019 Call, 6 companies (SMEs and industry) have (co-)applied and 5 will participate in Vouchers. Overall, nearly half of the applying PIs were female now.

**Table 1: Overview of the proposals for the EBRAINS Research Infrastructure Voucher Call 2020**

	Applied	Awarded
Number of Proposals	15 (23)	13 (13)
HBP Person Months applied for vs number awarded	175 (276)	149 (156)
Number of institutions	26 (31)	24 (19)
Number of companies - industry and SMEs	6 (0)	5 (0)
Number countries	16 (9)	14 (9)
Female participation (female PIs as % of all PIs)	48% (20%)	50% (30%)

Details of the projects which were awarded a Voucher are given in Table 2 for the new Vouchers of the 2020 Call, and Table 3 for the running Vouchers of the 2019 Call.

The selected Voucher projects will start from May 2021 on and last 12 months.

Most of the Voucher projects of the 2019 Call are still running and will end between May and November 2021.

## 4.2 Which Service Categories were the proposals interested in?

Scientists putting forward proposals for the Call were required to specify which [EBRAINS Service Categories \(SC\)](#)<sup>6</sup> they were interested in working with. The EBRAINS Service Categories are defined as follows:

- SC1 Knowledge Graph - Curated and shared data: EBRAINS FAIR data services - neuroscience data
- SC2 Brain atlas services: navigate the brain in 3D - find, contribute and analyse brain data, based on location
- SC3 Brain modeling and simulation workflows: integrated tools to create and investigate models of the brain
- SC4 Closed loop AI and robotics workflows: design, test and implement robotic and AI solutions

<sup>6</sup> <https://ebrains.eu/services>

- SC5 Medical brain activity data platform: human intra-cerebral EEG database and analysis service
- SC6 Interactive workflows on HPC or NMC: Europe-wide access to scalable and interactive computer services

Figure 2 shows for each SC, the number of proposals received and the number which were awarded a Voucher. For comparison, the proposals of the 2019 Call are listed as well.

In both Calls, there was a clear preference for the EBRAINS Brain Simulation services. In the 2020 Call the distribution of requested services has widened compared to the 2019 Call, which shows the increasing demand of the research community for the EBRAINS infrastructure with its full range of integrated services and tools.

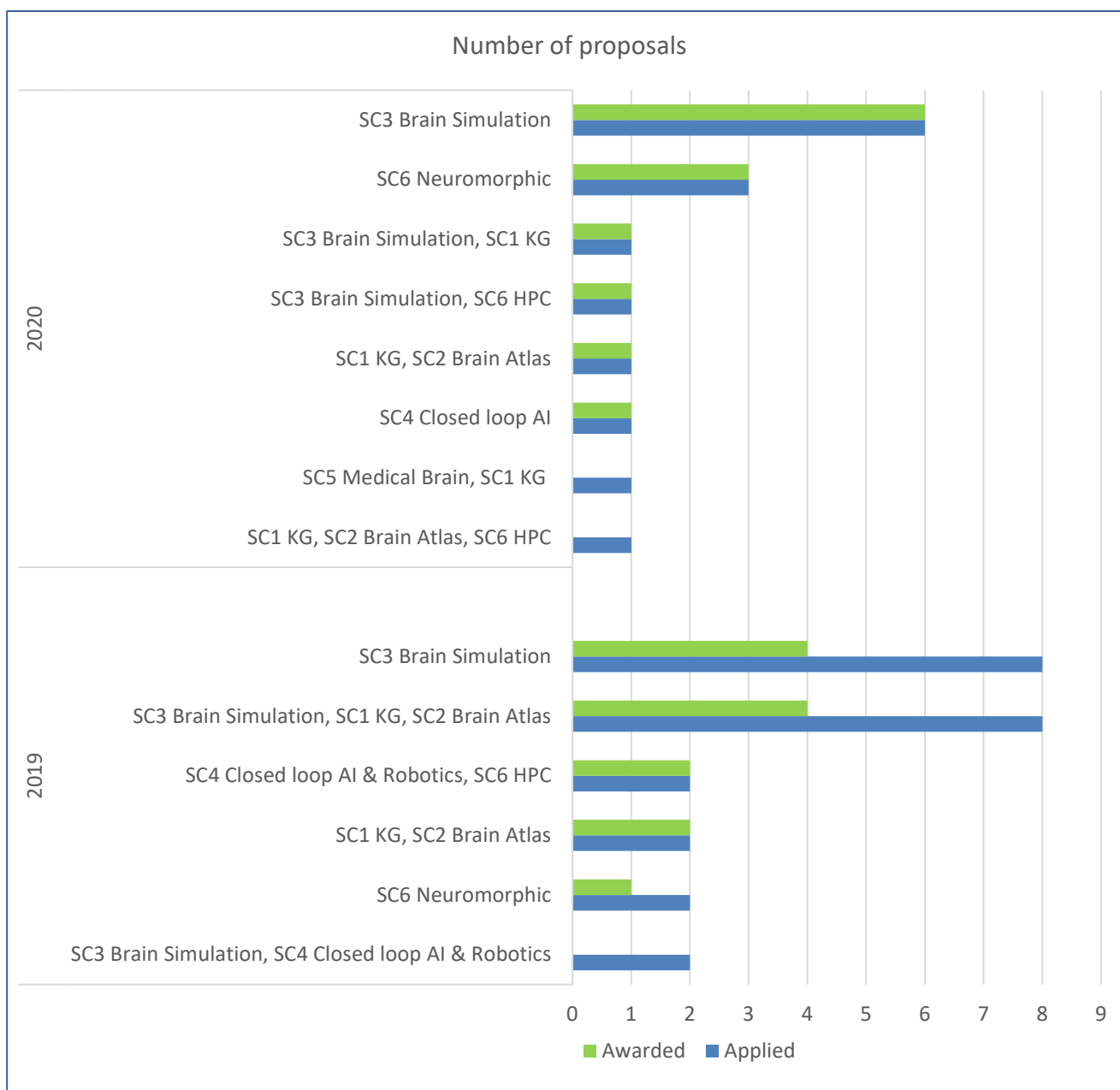


Figure 2: EBRAINS Service Categories that the proposals targeted - Calls 2020 and 2019

Abbreviations: KG = Knowledge Graph, HPC = High Performance Computing and Analytics, Neuromorphic = Neuromorphic Computing

### 4.3 Geographical distribution of partners in proposals

National involvement in the 2020 Call compared to the 2019 Call is summarised in Figure 3.

The proposals received from both Calls involved partners from 19 countries, including countries outside of the European Union: UK, USA, Canada, Australia, Japan and India. The HBP is trying to increase participation by EU Member States in Eastern Europe, so it was gratifying to receive proposals involving partners in the following countries: Lithuania, Estonia and Poland. Vouchers were awarded to proposals involving partners from 17 countries.

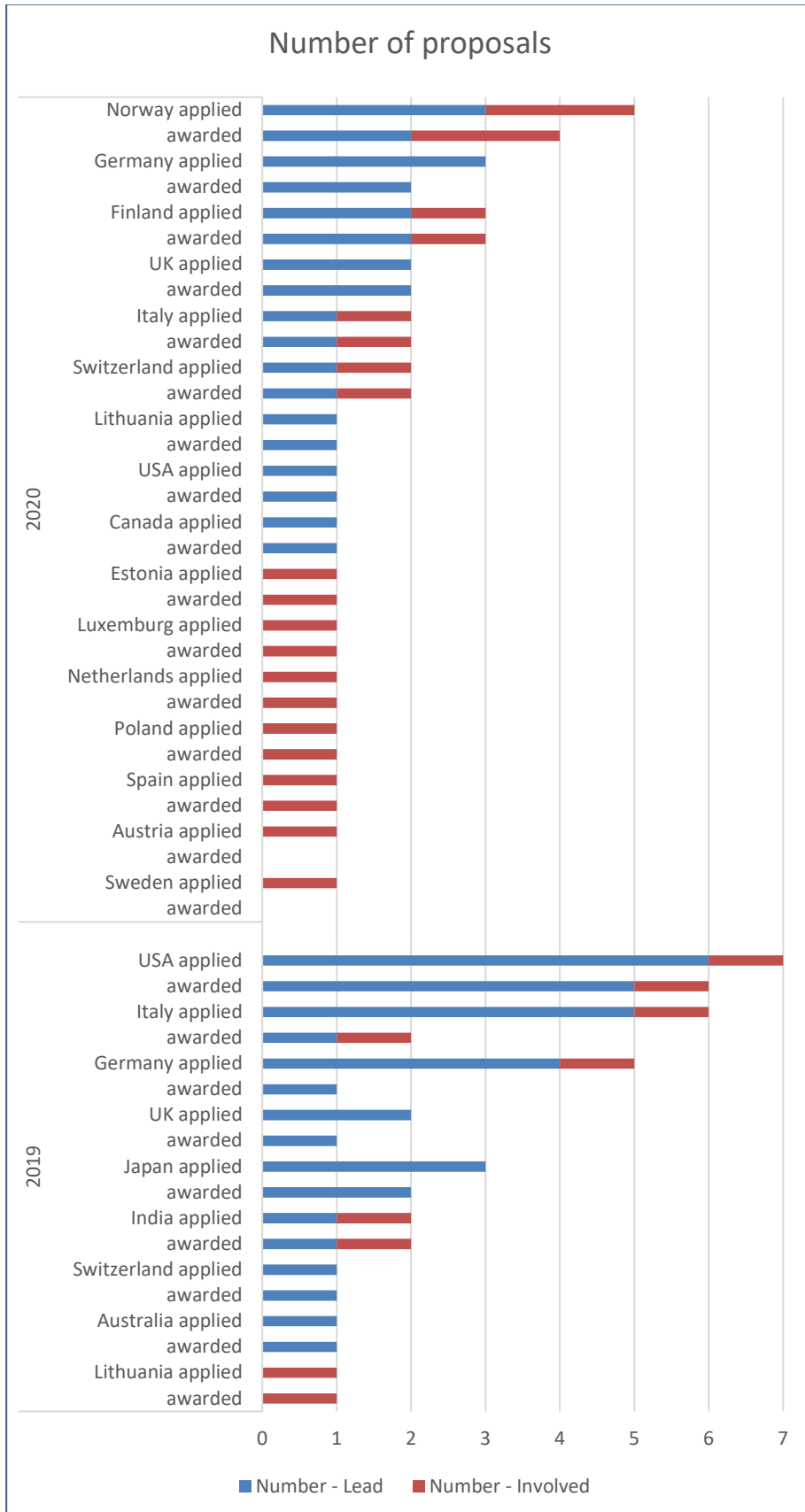


Figure 3: Proposals received from respective countries - Calls 2020 and 2019



## 5. Integration of Voucher projects

The 13 new Voucher projects will be guided by the HBP Partnering Environment Coordinator to start the procedure to integrate into the [HBP network as Partnering Project \(PP\)](#)<sup>7</sup> and ensure long-term sustainable collaborations.

Eight projects of the 2019 Call have been successfully developed into [Partnering Projects](#)<sup>5</sup>.

Additionally, all projects are integrated in the Task of the [EBRAINS High Level Support Team \(HLST\)](#)<sup>8</sup> which will support the Voucher teams to reach their aims and integrate generated data and knowledge into the EBRAINS infrastructure. The generated new features, applications and results of the Voucher projects directly contribute to the HBP Outcomes, which is a set of high level results of the HBP.

For further engagement with the user community, the leaders of the High Level Support Team, the Communication Team, the Service Level Unit, the Voucher Task, the Education Team and [Innovation Team](#)<sup>9</sup> are currently working on an action plan that will include specific measures for the Voucher partners.

**Table 2: List of selected Voucher proposals - 2020 Call**

Abbreviations: SC = Service Category, PM = Person Month

#	Acronym	Titel	SC	PM	Institution of Applicants	Institution of HBP Partners
1	PERIVIS	Unraveling the architecture of murine perirhinal and visual neural networks underlying perceptual and mnemonic processes using FAIR data	1, 2	12	University of Oslo (NO)	University of Oslo (NO)
2	NextGen	Next generation neural mass models: bridging the scales from micro to macroscopic dynamics	3	12	CNR-Istituto dei Sistemi Complessi (IT)	Aix-Marseille Université (FR)
3	ParkinsonBrain	Prediction of neurosurgical treatment outcomes in Parkinson's disease	3	12	University of Health Sciences (LT), Hospital of Lithuanian University of Health Sciences Kauno klinikos (LT), Nencki Institute (PL)	Aix-Marseille Université (FR)
4	AI-MIND	Intelligent digital tools for screening of brain connectivity and dementia risk	3, 1	12	Oslo University Hospital (NO)	Charité (DE)

<sup>7</sup> <https://www.humanbrainproject.eu/en/about/project-structure/partnering-projects/>

<sup>8</sup> <https://ebrains.eu/support/>

<sup>9</sup> <https://www.humanbrainproject.eu/en/collaborate/innovation/>

#	Acronym	Titel	SC	PM	Institution of Applicants	Institution of HBP Partners
		estimation in people affected by mild cognitive impairment			AI MIND consortium: Aalto University (FI), accelopment AG (CH), Alzheimer Europe (Lux), BrainSymph AS (NO), Det Norske Veritas-Germanischer Lloyd Group (NO), Helsinki University Hospital (FI), Scientific Institute for Research, Hospitalization and Healthcare, San Raffaele Pisana (IT), Lurtis Rules S.L. (ES), Neuroconnect Srl (IT), Oslo Metropolitan University (NO), Radboud University Medical Center (NL), Tallinn University (EE), Complutense University of Madrid (ES), Università Cattolica del Sacro Cuore (IT)	
5	SubSchiz	Startle-network modelling for schizophrenia research - insights from subcellular models of neuromodulation	3	12	Tampere University (FI) and University of Oslo (NO)	Royal Institute of Technology of Sweden (SE)
6	NeuroSMS	Simulating direct calcineurin suppression of protein kinase A in neurons	3 (6)	10	University College London (UK)	Royal Institute of Technology of Sweden (SE) and École Polytechnique Fédérale de Lausanne (CH)
7	NEST-Demoa	NEST-Demoa co-simulation: Towards linking closed-loop motor control models to multi-scale experimental data	3	12	University of Stuttgart (DE)	Norwegian University of Life Science (NO)
8	NEST-SONATA	Efficient support for Sonata in NEST	3	12	Allen Institute (US)	Norwegian University of Life Science (NO)
9	AstroNeuronNets	Astrocyte-neuron interactions in large-scale networks: Developing new astrocyte modules for NEST simulator	3	10	Tampere University and University of Eastern Finland (FI)	Juelich Research Center (DE)
10	CATRA	Cognitive architecture for therapy robots and avatars	4	12	University of British Columbia (CA)	University of Sheffield (UK)
11	LoL4 Speech	Exploiting local learning and criticality for speech recognition	6	12	Max Planck Institute for Dynamics and Self-Organization (DE)	Heidelberg University (DE)
12	STROBE	Surrogate-gradient-based training on BrainScaleS-2	6	12	Friedrich Miescher Institute of Biomedical Research (CH)	Heidelberg University (DE)

#	Acronym	Titel	SC	PM	Institution of Applicants	Institution of HBP Partners
13	Async-Neuromorph	Neuromorphic hardware operating at the edge of aynchrony	6	9	Bournemouth University (UK)	University of Manchester (UK)

**Table 3: List of selected Voucher proposals - 2019 Call**

Abbreviations: SC = Service Category, PM = Person Month

	Acronym	Proposal	SC	PM	Institution of Applicants	Institution of HBP Partners
1	DOPAMAP	Map of dopamine receptor positive cell types in the developing and adult mouse brain	1, 2	12	The Florey Institute of Neuroscience and Mental Health (AU)	University of Oslo (NO)
2	BRAINSPACE	Workflow optimization for brain-wide spatial analysis to identify regional and cell-type correlates of resilience to Alzheimer's in the AD-BXD mouse population	1, 2	12	The Jackson Laboratory (US)	University of Oslo (NO)
3	StriatalPlas	Multiscale Striatal Models for Neuronal Plasticity: Integration to the Brain Simulation Platform	3 (1)	12	George Mason University (US), National Center for Biological Sciences (IN)	Royal Institute of Technology of Sweden (SE)
4	ATLAS-cer	Enhanced mouse atlas for cerebellar connectivity	3 (1)	12	University of Washington (US), Allen Institute for Brain Science (US)	University of Pavia (IT)
5	BOLDsim	BOLD signal reconstruction and simulation from cellular data-driven models	3	12	AMRITA Vishwa Vidyapeetham (University) (IN)	University of Pavia (IT), Aix-Marseille Université (FR)
6	SODIUMsim	SODIUM signal reconstruction and simulation from cellular data-driven models	3	12	University College London (UK), IRCCS Mondino Foundation (IT)	University of Pavia (IT), Aix-Marseille Université (FR)
7	HippoTrisyn Plasticity	Modeling Synaptic Plasticity in the Hippocampal Trisynaptic Circuit: Integration to the Brain Simulation Platform	3	12	Justus-Liebig University Giessen (DE), Lithuanian University of Health Sciences (LT)	Royal Institute of Technology of Sweden (SE)
8	M3N2	Multiscale Mathematical Modeling: from Neurons to Networks	3	12	Università degli Studi di Napoli Federico II (IT)	Consiglio Nazionale delle Ricerche (IT)
9	INDOME	Integrating a Multimodal Olfactory Bulb Model into EBRAINS	3	12	Yale University School of Medicine (US)	Consiglio Nazionale delle Ricerche (IT)

	Acronym	Proposal	SC	PM	Institution of Applicants	Institution of HBP Partners
10	EBRnetpyne	Integration of NetPyNE into EBRAINS Platform	3	12	Kings County Hospital (US), SUNY Downstate Medical Center (US)	Consiglio Nazionale delle Ricerche (IT)
11	EXABRAINPREP	Preparing brain models for exascale systems	6 (4)	12	RIKEN (JP), Okinawa Institute of Science and Technology (JP), University of Electro-Communications (JP)	Norwegian University of Life Science (NO)
12	RoBoBrain	Whole-brain spiking neural network and rodent musculo-skeletal models integration for behavioral experimentation in the neurorobotics platform	4, 6	12	Okinawa Institute of Science and Technology Graduate University (JP), The University of Electro-Communications (JP), RIKEN (JP)	Technical University Munich (DE)
13	INTREC	Leveraging intrinsic recurrence for temporal processing in spiking neural networks systems	6	12	Friedrich Miescher Institute of Biomedical Research (CH)	Heidelberg University (DE)