The HBP Calls for Expression of Interest for SGA3

“Preparing Cellular-Level Models for Portable HPC Simulation using Arbor”

Proposal Template

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| --- | --- | --- | --- |
| Project Number: | 785907 | Project Title: | Human Brain Project SGA2 |

|  |  |
| --- | --- |
| Document Title: | HBP CEoI for SGA3 - Preparing Cellular-Level Models for Portable HPC Simulation using Arbor – Proposal Template |
| Document Filename: | HBP\_SGA2\_CEoI\_Arbor\_Proposal\_Template |
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| Proposal Submission Deadline: | 04.12.2019 17:00 Brussels time |
| Proposal submission online platform | [HBP Open Call Platform](https://opencalls.humanbrainproject.eu/all_calls) |
| Total Call Budget: | EUR 900,000. Maximum funding per proposal: EUR 450,000 |
| More information: | [info@opencalls.humanbrainproject.eu](mailto:info@opencalls.humanbrainproject.eu) |

Instructions:

This template is for proposals made in response to the HBP CEoI for SGA3.

Page limits refer to this text style (Body Text HBP) in MS Word:

* **Font**: Trebuchet MS 11pt
* **Line spacing**: single
* **Paragraph spacing**: 6pt before and after
* **Page size**: A4
* **Margins**: according to this template
* **Page limit**: 18 A4 (plus 1 page per additional Partner).

Letters of support can be added to the proposal. These letters will be considered as appendices, which do not count towards the page limit.

This form must be submitted electronically any time before the 04.12.2019 17:00 Brussels time to the [HBP open call platform](https://opencalls.humanbrainproject.eu/all_calls). Budgetary information must be provided via the electronic submission platform.

Instructions (in red) should be deleted.

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# Proposal information

Proposal name:

Proposal acronym:

Table 1: Proposal Consortium

|  |  |
| --- | --- |
| Project coordinator (contact person) | |
| First and last name |  |
| Email |  |
| Affiliation[[1]](#footnote-1) and short name |  |
| Country |  |
| Project partner 1 | |
| First and last name |  |
| Email |  |
| Affiliation and short name |  |
| Country |  |

Please extend the table for each partner of the consortium.

# Abstract

NOTE: length limit = 1 A4

# Scientific excellence and impact

NOTE: length limit for this chapter, including diagrams, images, etc. = 8 A4

## Methodology

In this section, describe the methodology you will use to accomplish the activities listed in the Guide for Applicants and to reach the expected contributions. Explain the methodology in detail and state how it relates to your experience in other similar contexts. Show how you are uniquely positioned to accomplish the objectives of the proposed work plan.

## Contribution of the proposal

Describe the contributions you will make to the HBP and the expected results of your future activities. Explain how they relate to the Flagship objectives of the HBP (see FPA under <https://www.humanbrainproject.eu/en/about/framework-partnership-agreement>) and to the objectives specific to SGA3 (see supplementary document HBP\_SGA2\_CEoI\_for\_SGA3\_Proposal\_Summary).

Please define your interaction with the existing WP of the HBP and the contribution to the HBP research platforms. Please be as specific as possible and clearly define the added value of your work to the HBP as a whole.

Your proposal should address the following points, as further detailed in the call:

* Explain integration with Arbor development in some of the areas mentioned in the call.
* In each case, significant parallel computational resources as well as integration into modular software infrastructure and workflows for supercomputing are required. Demonstrate that such resources are required for currently computationally intractable problems, include plans for the use of such resources, and describe targeted resources and centres.

Existing models and workflows designed for NEURON will be ported to a simulator agnostic description, and their portability will be validated using the Arbor simulation engine. Such validation will require commitment from interested parties to update workflows and model descriptions, support from the Arbor developers to add features, and HPC resources for the jointly implemented simulations. Thus, the integration of Arbor aims to achieve both transformative simulation performance and improved support for open standards and development for simulation services on the EBRAINs platform.

* Show commitment to these approaches: how will existing and new models and workflows be ported to simulator agnostic descriptions? How do you plan to integrate with current Arbor development? How will HPC resources for jointly implemented solutions be used? How will you use open standards and development to integrate with the EBRAINs platform? Are the proposed models and simulation features broadly useful to the neuroscientific community?
* Document how you will enable isolation of simulator-specific components, develop Arbor-specific elements, and co-develop required features with the Arbor team. All required features should be tabulated; existing features or features in progress should be identified, and new features should be planned in collaboration with Arbor team before the proposal is submitted (the pre-proposal may be used as one method to get feedback).

In particular, address the following points:

* Explain the model and workflow, and why it is relevant for HPC.
* Describe scientific outcomes that would will be specifically enabled by using state-of-the-art HPC simulation.
* Describe how the models and required datasets will be publicly released.
* Describe how the results of simulation ported to a new model description will be validated against existing results.

For all aspects, please provide evidence of your specific expertise.

## Relevance to the aims of the Human Brain Project

NOTE: length is limited to 3 A4.

In this section, describe the cross-cutting aim of your proposal, the benefits of your approach and the knowledge generated for the HBP as a whole, as well as for the HBP research infrastructure. Show that you are not duplicating work already done in the HBP.For a detailed description of the HBP WP, please refer to HBP\_SGA2\_CEoI\_for\_SGA3\_Proposal\_Summary.

Requirements that you need to demonstrate in this section:

Show commitment at the highest level to the HBP’s goal of open software, open development and open data, including models, networks and analytical results, across simulation engines and on emerging HPC resources. Models and simulations should support the goal of reproducible, validated and verified simulation.

The objectives of this CEoI to be demonstrated by proposals are to:

* Encourage the adoption of open standards in the computational neuroscience community in Europe.
* Increase the target audience of the cellular-level simulation facilities of the HBP simulation platform.
* Validate and improve the HBP-developed simulation technology Arbor.

**I**n particular, address the following points:

* Explain how the model and workflows will extend current capabilities of Arbor in light of EBRAINs integration and wider use by the neuroscientific community
* Describe how the models and required datasets will be publicly released
* Describe how the resulting workflows will use European HPC supercomputing resources and exercise them in ways that have not been previously possible by the neuroscientific community
* A timeline and resource requirement for porting existing models and ad-hoc model descriptions to open data formats such as SONATA and NEUROML should be included. A plan for and commitment to releasing all data sets, workflows and documentation as open access should be demonstrated.

# Implementation

NOTE: length limit for this chapter, including diagrams, images, etc. = 5 A4

## Structure of the Work Plan

The proposed work plan should include one Task, Milestones and Deliverables. The Task leader plus its organisation need to be clearly identified. The planning should be sufficiently detailed to justify the proposed effort.

Table 2: Proposal Work Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Plan for <Proposal Name>  Task <Name>  <Lead Partner> | | | | |
| Task Number <T x> | Task <Name> | Lead Partner / PI | Start Month | End Month |
|  |  |  |  |  |
| Milestone Number <MS x> | Milestone <Name> | Means of verification | Lead Partner | Due date (Month) |
|  |  |  |  |  |
| Deliverable Number <D x> | Deliverable <Name> | Description | Lead Partner | Due date (Month) |
|  |  |  |  |  |

Please extend the table as needed.

## Description of the Work Plan

Describe the work you propose for the period of 30 months. Contribution to the project activity reports will be required from the new Partners; for example, reporting on resources used in the period.

Table 3: Proposal Work Plan description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Plan for <Proposal Name>  Task <Name>  <Lead Partner>  Please insert your concrete (SMART [[2]](#footnote-2)) Objectives. Describe how you would reach these Objectives and how you would measure the results, e.g. the method you will use, the major scientific Milestones of your work, etc. This will become your Task description in the SGA3 Description of Action (DoA). | | | | |
| Task Number <T x> | Task <Name> | Lead Partner / PI | Start Month | End Month |
| Task descriptions should contain, in three separate sections:   * **Aim** of the Task * **Methods** to be used by the Task * **Outputs** (list of Outputs to which this Task contributes) | | | | |
| Interactions with the other WP.  The proposal should interact with other WPs. Please provide a short description for each relevant interaction. | | | | |
| HBP WP number | Description | | | |
|  |  | | | |

Please extend the table as needed.

## Quality of the Organisation

NOTE: length is limited to 1 A4 per Organisation.

In this section, describe the quality and relevance for the HBP of your Organisation/Group and what expertise it will bring to the HBP Consortium that is not already available. In particular, your proposal should address the following points:

* Brief description of the Organisation
* Brief description of the participating group/lab and their previous relevant experience to the task in the proposed work.
* Short profile of the main individual who will undertake the work, demonstrating their qualifications with respect to the task at hand.
* Up to five relevant publications. (NOTE: no extra annex for references is allowed!)
* Characterize the co-funding/proposed in-kind contributions the proposal will bring to the project (on average 50% of the proposal budget)

## Resources to be committed

NOTE: length is limited to 1 A4 of text plus the online budget tables.

You should address the following points:

* Describe how the totality of the necessary resources will be mobilised in the defined time frame including your own resources which you will be providing to complement the EU contribution.
* Identify **personnel costs** and any major **non-personnel direct costs**, and explain why they are necessary for the activity you propose. Justify equipment to be purchased, describe travel expenses, and other major cost items.
* Indicate whether you will include **subcontracting costs**, justify them, and state what they are and their amount. Subcontracting costs are not subject to indirect costs. Please note that you cannot subcontract core activities. Services purchased in the frame of the funded activity only count as subcontracting if they consist in a part of the task to be accomplished. Support of the activity, such as event organisation or software development, is not a subcontracting cost, unless the activity implicitly involves such activities.
* A voucher of EUR 43,000 is foreseen to fund technical support for integration of project results in EBRAINs, which will be performed by the HBP High Level Support Team (HLST). Include this voucher in your budget table, justify the possible usage.

## Cost and funding breakdown by participating organisation for the specific time frame

Please fill the **online budget table** for every partner of your application. The online budget table will be automatically added to your proposal upon submission*.*

# Equal opportunities

NOTE: length is limited to 1 A4.

Please provide the following information:

* For teams, is the diversity aspect (gender, age, career stage, other factors) taken into consideration/ are there any measures in place? If there is a gender imbalance, are measures planned to improve gender equality?
* In research activities when human beings are involved as subjects or end-users, gender differences or other diversity factors may exist. In these cases, is the gender dimension and relevance of scientific questions on gender or other diversity factors (e.g. age) in the research content addressed as an integral part of the proposal.

# Ethical implications

NOTE: length is limited to 1 A4.

Describe the ethical implications of your work and compliance with applicable international, European, and national law. Indicate which ethical approvals the project already has in place or will need to apply for. The proposal should also describe an approach to handle and mitigate possible risks related to data protection.

1. Affiliation = university or organisation, laboratory, department, etc. [↑](#footnote-ref-1)
2. SMART: Specific – target a specific area for improvement. Measurable – quantify or at least suggest an indicator of progress. Achievable – state how the results can be realistically achieved. Realistic – state what results can realistically be achieved, given available resources. Time bound – specify when the result(s) can be achieved. [↑](#footnote-ref-2)