

VPH NoE – Virtual Physiological Human Network of Excellence



The Virtual Physiological Human Network of Excellence (VPH NoE) has been designed with 'service to the community' of VPH researchers as its primary purpose. The aims of the network range from the development of a VPH ToolKit and associated infrastructural resources, integration of models and data across the various relevant levels of physiological structure and functional organisation, through to VPH community building, training activities and support.

PROJECT OBJECTIVES

- Inter-institution and interdisciplinary research projects;
- Development of the VPH ToolKit: shared and mutually accessible resource of data;
- Facilitation of development of horizontal and vertical model/data integration;
- Development of interdisciplinary training activities and VPH careers;
- Establishing a core set of VPH-related dissemination and networking activities;
- Implementation of key working groups to pursue integration of VPH research worldwide
- Creation of Industrial, Clinical and Scientific Advisory Boards for consultation

By involving clinical and industrial stakeholders, the VPH network of Excellence also plans to create a reliable foundation to support sustainable interactions and collaboration between research and healthcare communities.

The Challenge:

One of the key challenges in the development of quantitative, integrative and predictive models that describe human physiology is the provision of the necessary research infrastructure. This includes methodologies, databases and computational tools, that will allow scientists working in different scientific fields (at various physiological levels and scales) to communicate, exchanging data and technologies in a standardised manner. The scale of data to be generated, processed, and exchanged requires software tools and massive computer storage and that are currently not widely available. Dissemination is another key challenge as the VPH NoE scope is by definition multidisciplinary and only

a very limited number of journals currently accept physiome - related papers. Scientists able to deal with multidisciplinary topics are required, necessitating a need for training of multidisciplinary individuals and VPH specialists.

The VPH NoE will perform as an inwardly integrated and progressive networking action, at the centre of a wider network of VPH researchers throughout Europe

The Way Forward:

The VPH NoE objectives outlined reflect the above challenges, and will be addressed by a core group of project members - 13 institutions who are fully committed at the highest institutional level to the concept of the VPH NoE. They represent centres of excellence in physiological modelling; data processing and analysis; high performance computing; genomics; bioinformatics and medical informatics. Many Partners have shown prior commitment to integration within the European Research Area through leadership of, or involvement in, European Commission Sixth Framework Networks of Excellence and Collaborative Projects. The 13 organisations have clinical and industrial associations crucial for the creation of a VPH research environment with active end-user involvement. The core membership is augmented by a large and growing general/associate membership, comprised of institutions, organisation and commercial enterprise interested in VPH activities.

PROJECT DESCRIPTION

This leading group of universities, institutes and organisations aim to promote the creation of a virtual environment that actively supports and nurtures interdisciplinary research, education,

VPH NoE Exemplar Project: Supporting integrative, interdisciplinary research

VPH NoE Exemplar project (EP) support will be awarded through an annual competitive grant mechanism open to all VPH NoE member organisations. Individual EP support will be manifest as a grant of 6-12 months duration, to fund personnel strictly focussed on integration of VPH-related research already underway and which addresses an area of need. The EPs will foster new collaborative links, benefiting from transfer of skills from related VPH activities, with the mandate to make output (models, data repositories etc.) available to the VPH community via the VPH ToolKit, and with the expectation that such support will contribute to the ability of the recipients to obtain follow-on funding.

training and strategic development. In keeping with the general ethos of the VPH NoE, Exemplar Projects (EPs) will be developed (see box on page 1). EPs work towards integration amongst VPH researchers, in order to address specific research problems or challenges. The aim is to provide solid examples of horizontal and vertical model/data integration, which may only be achieved through the integration of disparate knowledge and research infrastructure.

The VPH ToolKit aims to provide the technical and methodological framework to support and enable VPH research. The Toolkit will be a shared and mutually accessible source of research equipment, managerial and research infrastructures, facilities and services. Other VPH projects, including the Exemplar Projects (EPs) will both be able to add and draw capacity from it. In pooling these activities within the VPH research area, issues of interoperability, standards and – more broadly - integrative VPH research, will be addressed.

The VPH NoE recognises a necessity for scientists able to deal with multidisciplinary topics. The VPH NoE will create a framework to support and facilitate this training. We will address training and career development for both early and in-career VPH researchers and training activities will pay special attention to the outcomes generated from other VPH-related projects and existing European Commission initiatives (e.g. Marie Curie).

Through dissemination, the “impact” of VPH NoE initiatives relating to VPH EPs, the VPH ToolKit, and interdisciplinary training will be maximised. In addition, an emphasis will be placed on the development of clear and consistent lines of communication and information dissemination within and beyond the VPH NoE itself – crucial to the ongoing success of the VPH initiative as a whole.

EXPECTED RESULTS & IMPACTS

The VPH NoE, within the broader VPH Initiative, should be responsible for:

- Strengthening the leadership role and increased interdisciplinarity of European research in biomedical research by fostering cooperation between disciplines and institutions
- Creating a more cohesive VPH research community, both within and beyond the EU.
- Improving semantic interoperability of biomedical information and contribution to a common EU health information infrastructure.
- Creation of new environments for predictive, individualised, evidence-based healthcare - to improve efficacy and safety.

- Acceleration of device and drug intervention development through predictive in silico modelling.
- Enhancing recognition on a national level of the importance of modelling and simulation in biomedicine.
- Increasing emphasis on interdisciplinary training in both biological and biomedical-engineering/physics curricula

Administrative information:

VPH NoE

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3. Centre National de la Recherche Scientifique, France
4. Universite Libre de Bruxelles, Belgium
5. Institut National de Recherche en Informatique et en Automatique, France
6. The University of Nottingham, UK
7. University Pompeu Fabra, Spain
8. University of Auckland, New Zealand
9. European Molecular Biology Laboratory, Germany
10. The University of Sheffield, UK
11. Karolinska Institutet, Sweden
12. Institut Municipal d'Assistencia Sanitaria, Spain
13. GEIE ERCIM, France

Timetable: June 2008 to November 2012

Total cost: €9,649,516.60

EC funding: €7,999,366.20

Instrument: NoE

Project Identifier: FP7-2007-IST-223920

Keywords: Interdisciplinary, Multilevel, Integration, Physiome, Modelling, Simulation.