Physiology and EUDAT

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What is the VPH?

The Virtual Physiological Human is a methodological and technological framework that will enable the investigation of the human body as a single complex system

This framework is:

- Descriptive
- Integrative
- Predictive

Organism
Organ
Tissue
Cell
Organelle
Interaction
Protein
Cell Signals
Transcript
Gene
Molecule

Integrative research

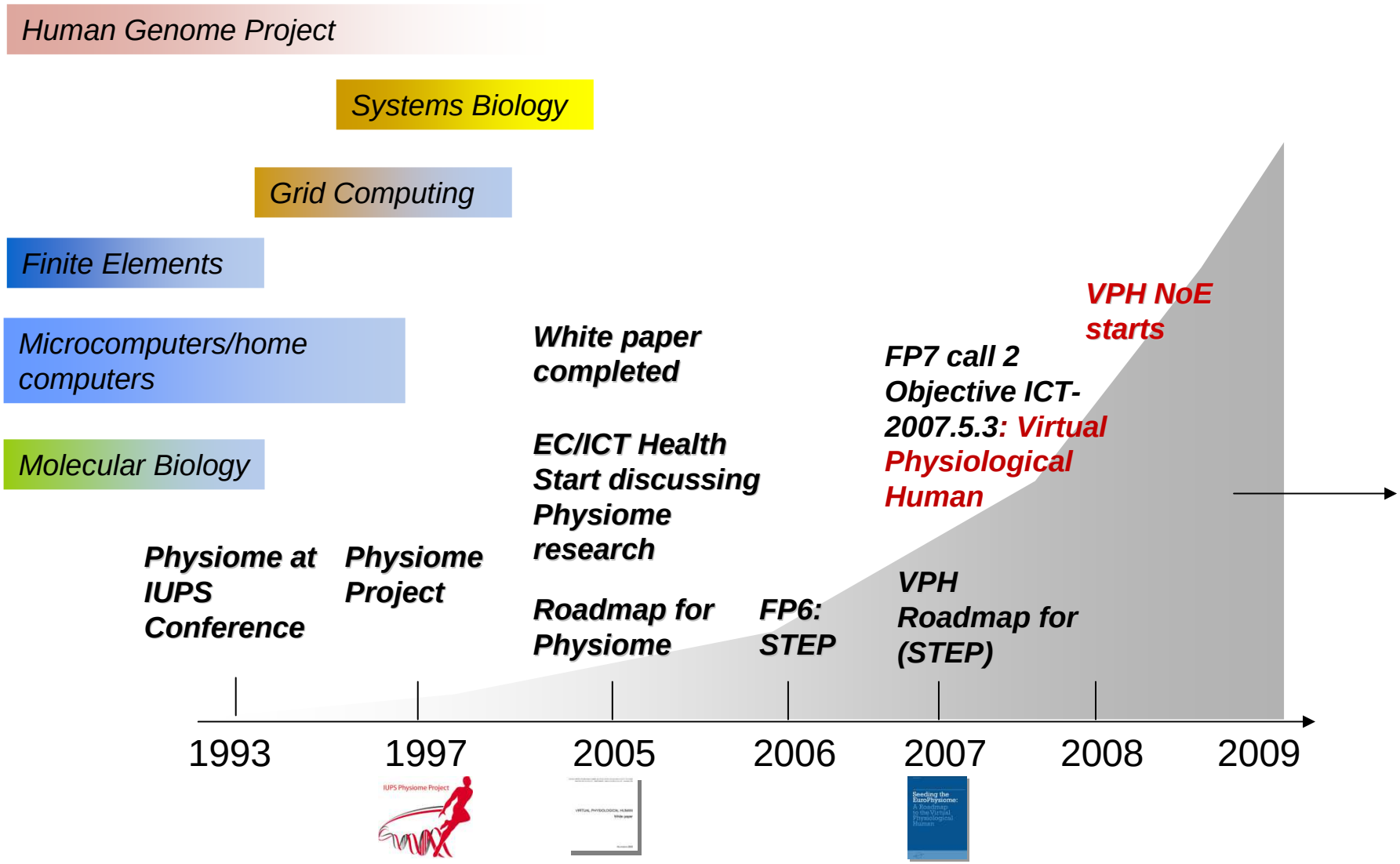
The Integrative Research approach requires a **radical** transformation of the way biomedical research is conducted

That is why it is necessary to create a framework made of technology and methods

This framework is called

Virtual Physiological Human

VPH/Physiome History



The VPH Initiative (VPH – I)

Funding available: 72 M€

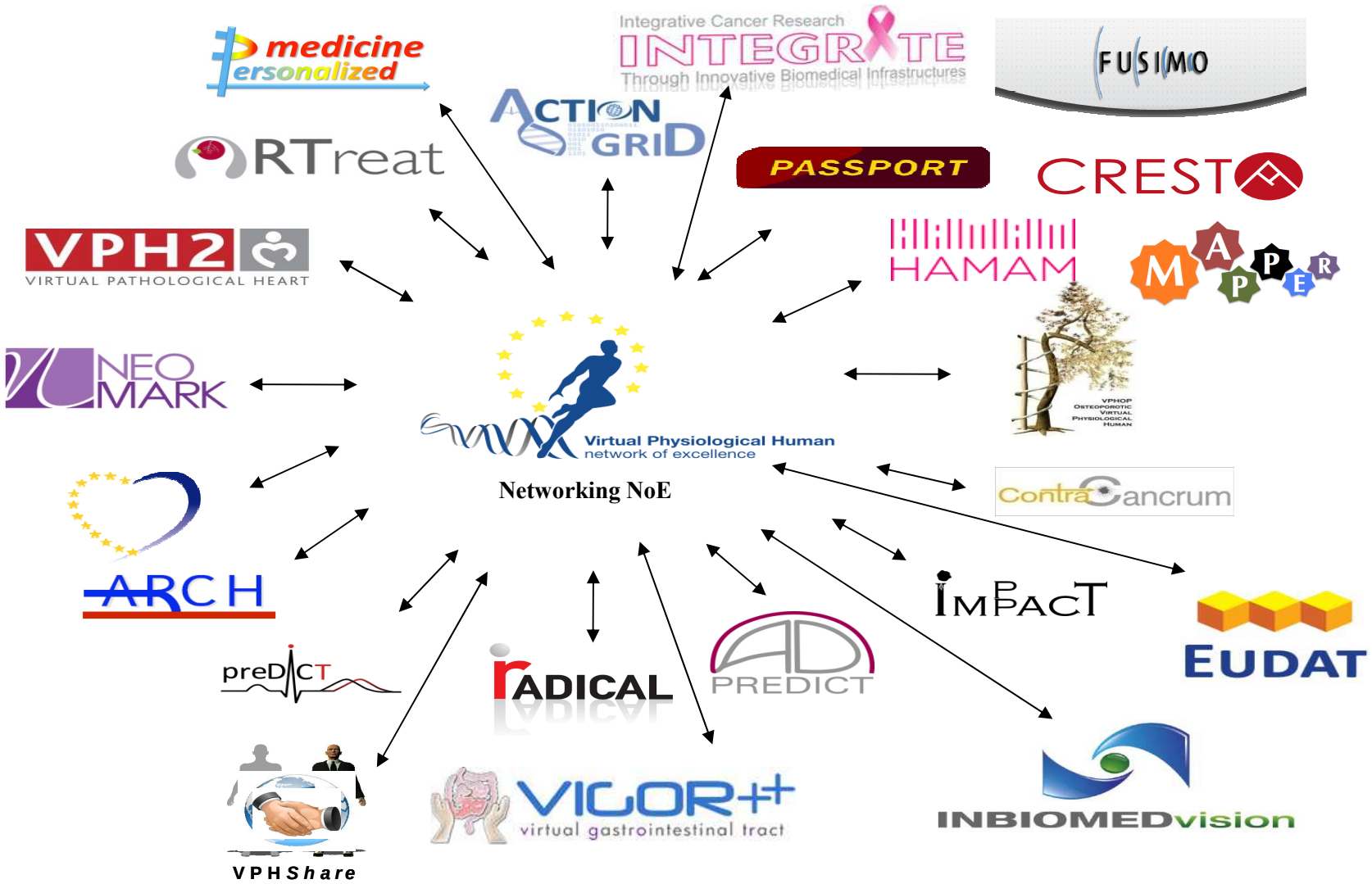
18 Collaborative projects (3 IPs/9 STREPs)

4 co-ordination and support actions

1 NoE to bring these together

- Collaborative projects within the call meet objectives associated with specific challenges
- VPH NoE connects all of these projects, and must focus on addressing issues of common concern that affect VPH-I projects collectively
  - research infrastructure
  - training
  - dissemination

VPH- I FP7 projects



VPH NoE

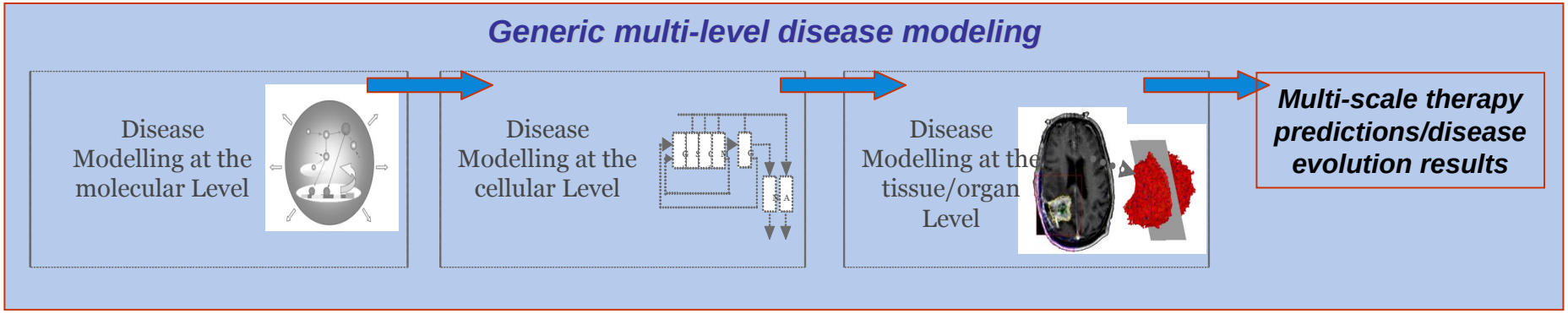
- VPH NoE - Virtual Physiological Human Network of Excellence
- Primary purpose to strengthen the VPH community and provide tools and services for researchers in the field
- Support VPH-I projects directly

"help support and progress European research in biomedical modeling and simulation of the human body. This will ***improve our ability to predict, diagnose and treat disease****, and have a* ***dramatic impact on the future of healthcare, the pharmaceutical and medical device industries****."*

Start Date	2008-06-01
End Date	2012-11-30
Project Funding	~9.65M€ (~7.99M€ EU funding)

P-MEDICINE: From data sharing and integration via VPH models to personalized medicine

Virtual Physiological Human
network of excellence



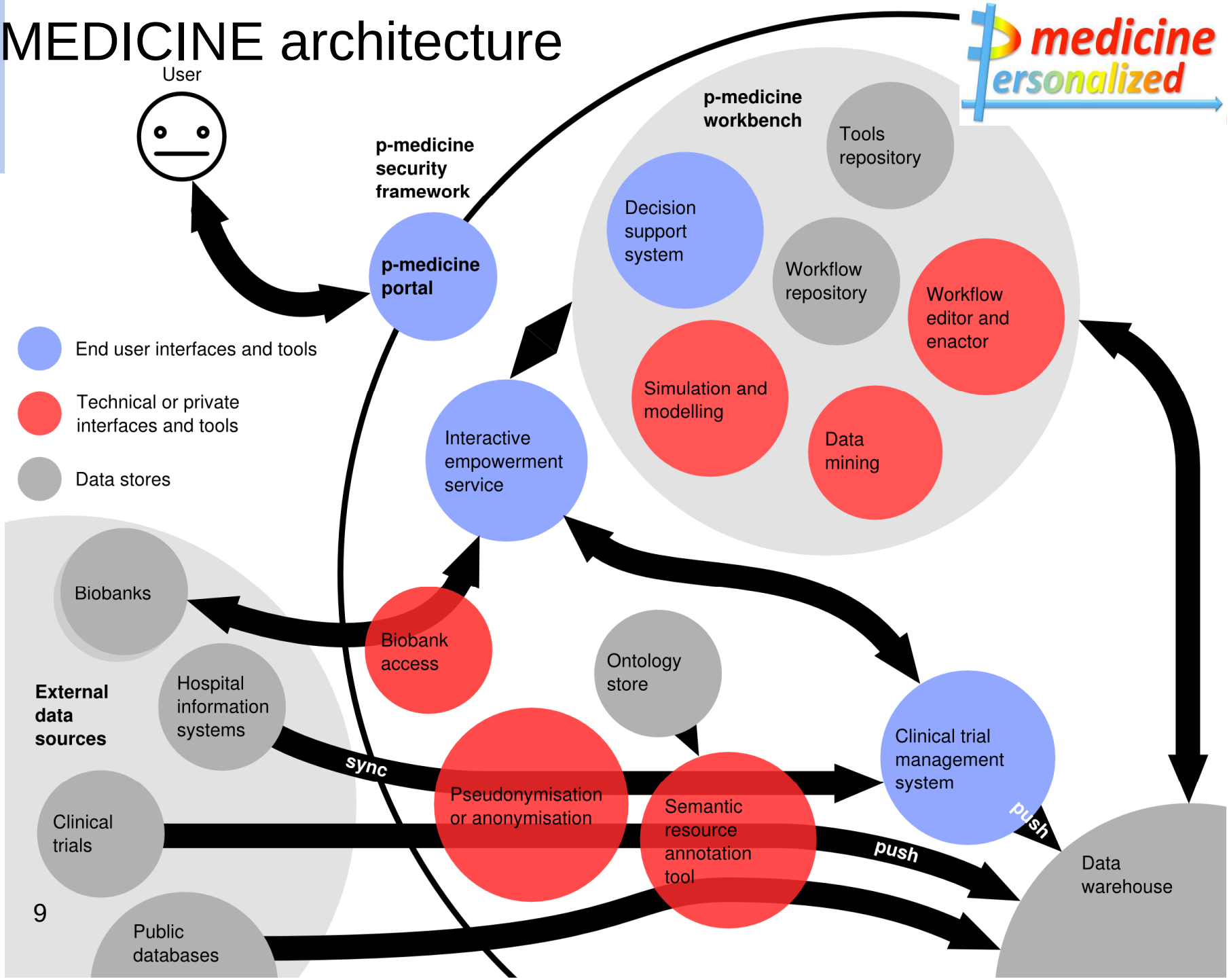
- Predictive disease modelling
- Exploiting the individual data of the patient in federated data warehouse
- Optimization of cancer treatment (Wilms tumor, breast cancer and acute lymphoblastic leukemia)
- Infrastructure supports:
  - generic seamless, multi-level data integration
  - VPH-specific, multi-level, cancer data repository
  - model validation and clinical translation through trials
- Scalable for any disease - as long as:
  - predictive modeling is clinically significant in one or more levels
  - development of such models is feasible

http://www.p-medicine.eu/

medicine personalized

Led by a clinical oncologist - Prof Norbert Graf! **€13M, 2011-2013, EU FP7**

P-MEDICINE architecture



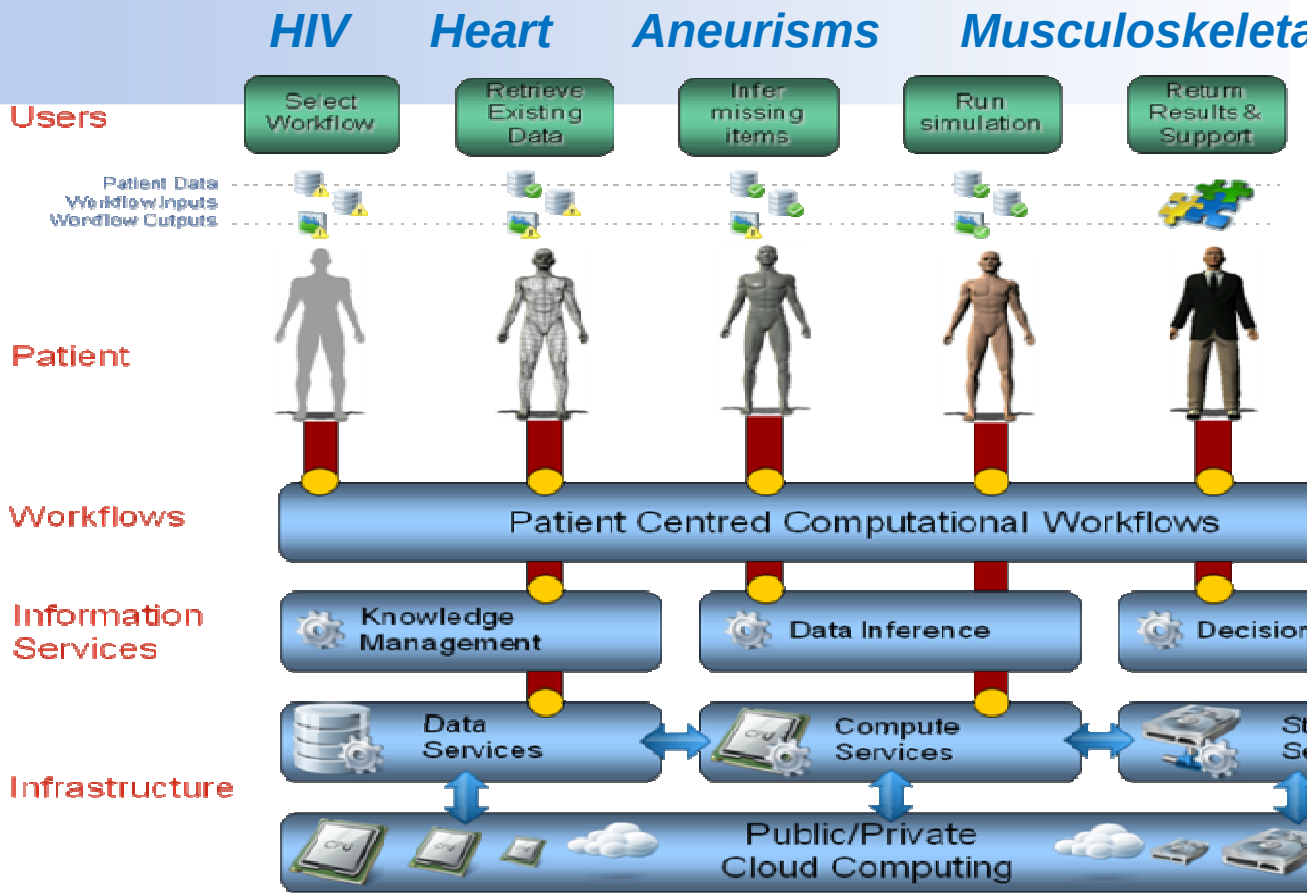
VPH-SHARE overview

- VPH-SHARE is developing the organisational fabric and integrate the optimised services to:
  - expose and share patient data (imaging, clinical, biomedical signals)
  - jointly develop multiscale models for the composition of new VPH workflows from @neurIST, euHeart, VPHOP, and Virolab projects
  - facilitate collaborations within the VPH community
  - evaluate the effectiveness and fitness-for -purpose of Data and Compute Cloud platforms for biomedical applications

- The project focuses on a key bottleneck: the interface with the wealth of data from medical research infrastructures and from clinical processes.

- Led by Rod Hose, Sheffield, UK (http://vph-share.org/)

VPH-Share Overview



Virtual Physiological Human network of excellence

VPH*Share*

VPH-Share will provide the organisational fabric realised as a series of services, offered in an integrated framework, to expose and to manage data, information and tools, to enable the composition and operation of new VPH workflows and to facilitate collaborations between the members of the VPH community.

€11M, 2011-2015, EU FP7 – Promotes cloud technologies

VPH Computational Requirements

- Science is becoming dependent on the trinity of compute+data+networks to acquire and process the data volumes being accumulated
- Provision of ICT resources and services has been achieved in a very *ad hoc* “best efforts” manner

  → e.g. the DEISA VPH Virtual Community which has now ended, and NO path for transition to PRACE Tier-0/1 is in place!
- ICT funded projects should receive fully aligned support from the EU based e-Infrastructure providers overseen by the infrastructure unit
- In a fully comprehensive strategy we need to be concerned about **hardware, software and people**

VPH & EUDAT

- What we want from EUDAT
  - A distributed data storage platform which we can build higher level services on
  - Simple interfaces so we can use EUDAT as our underlying data fabric
  - Close integration with compute
  - Long term archive and storage

- What we bring to EUDAT
  - Experience building federated data warehouses
  - Dealing with sensitive medical data

VPH in the Future

- VPH as a formal EU FP7 initiative may end in 2013 when FP7 concludes.
- Many funded VPH FP7 projects will continue into FP8
- Supporting ICT resources will continue to be required in the name of VPH for many years to come. Something VPH-like will persist into FP8 (maybe Digital Patient).
- ARGOS is establishing a “Transatlantic Observatory for Meeting Global Health Policy Challenges through ICT-Enabled Solutions”