VPH2012

Integrative approaches to computational biomedicine

Virtual Physiological Human
network of excellence

Conference
programme

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Welcome and conference overview

Dear VPH2012 Attendee,

We are pleased to welcome you to the VPH2012 conference on 'Integrative Approaches to Biomedicine'. This conference is the second in the series of international VPH conferences organized by the Virtual Physiological Human Network of Excellence (VPH NoE), and is supported by the European Commission ICT for Health / DG Information Society and Media.

VPH2012 is a celebration of all things related to the Virtual Physiological Human and is a place where leading experts and PhD students alike can come together to share, discuss and exchange ideas and visions in the effort to improve healthcare for all in the future. Marco Viceconti (outreach officer of the VPH NoE) once referred to the Virtual Physiological Human as a 'grand challenge', with a related challenge of identifying those applications where VPH technology can more easily show its efficacy and make a bigger impact. In the four years since the VPH Initiative began, many VPH-related projects – within Europe and beyond – have been achieving exactly that goal. The overall conference theme this year is "Integration", and VPH2012 is an opportunity to find out what other VPH teams have been working on around the world.

The program this year will consist of four conference themes: (1) **Physiome**: multiscale modelling of physiology and pathology; (2) **Virtual Physiological Human**: infrastructures and technologies for integrative biomedical research; (3) **Systems Medicine/ -omics**; and (4) **VPH in Translation**. Within each of the themes are sub-themes composed of individual sessions which show the huge diversity and complexity of the VPH. There will be over 150 VPH papers presented at the conference from participants all over the world – making this a truly international conference.

We are delighted to welcome four keynote speakers, who are internationally acclaimed leading experts in their respective fields: Professor Raimond Winslow (Director, Centre for Cardiovascular Bioinformatics and Modeling, Johns Hopkins School of Medicine, USA), Professor Salvador Moncada (Wolfson Institute for Biomedical Research University College London, UK), Professor Douglas Kell (Chief Executive, Biotechnology and Biological Sciences Research Council (BBSRC), UK) and Professor Hiroaki Kitano (President, The Systems Biology Institute, Japan, and Principal Investigator, Okinawa Institute of Science and Technology).

We collected feedback at VPH2010 and many of you in the community asked for more workshops and hands-on sessions in the second VPH conference. This year, we have scheduled seven workshops to take place alongside the main conference. "Sessional" workshops focus on a particular theme, whilst "hands-on" workshops will give attendees a deeper knowledge and familiarity of a specific set of tools or concepts, often in the context of demonstration sessions (see programme for details).

We are pleased to announce that a selection of VPH2012 papers (invited for peer-review on the basis of conference reviewer scores) will be published after the conference in Interface Focus. This follows on from the success of the VPH 2010 conference issue, appearing in Interface Focus

in 2011. The publication of a second VPH themed issue in such a prestigious journal shows a continued interest in the VPH field.

This conference is also a chance to bid farewell to the VPH NoE. The project will officially end in May 2013, following a six-month extension granted this year. The VPH NoE was created by a leading group of universities, institutes and organisations and was set up with 'service to the community' of VPH researchers as its primary purpose. Since its foundation in 2008, the VPH NoE has created:

- A 'VPH ToolKit' and web portal to encourage best-practice for common standards, open-source software, freely accessible data and model repositories.

- A 'Vision and Strategy' document (a roadmap for the VPH, included in your conference packs).

- A 'VPH Textbook' and Education Engine, which will be available in early 2013.

This momentum will be carried on by exciting projects pushing at each of these frontiers. Attendees will get a glimpse of the future at 2pm on Day 1 of the conference: Vanessa Diaz will discuss DISCIPULUS (the roadmap for the digital patient), Keith McCormack will present the work of the VPH ToolKit and web portal, Peter Hunter will discuss the 'Vision and Strategy' of the VPH Initiative, and Marco Viceconti will introduce you to the new VPH Institute for Biomedical Research.

The VPH Institute is an international non-profit organisation, whose mission is to ensure that the Virtual Physiological Human is fully realised, universally adopted, and effectively used both in research and clinic. The VPH institute will take over from the VPH NoE in many respects, including hosting the VPH conference series in years to come. Every two years, they will steer a bid selection process to assign the conference format to a local organising group.

One other important achievement of the VPH NoE is the Exemplar Projects (or EPs), externally funded projects with a "physiome" aspect, whose coordinators cooperate with the development of the VPH ToolKit by adopting ToolKit features as they become available, and, perhaps more importantly, by serving as a testing ground during development of tools, and adapting the software they develop for inclusion in the VPH ToolKit. The Exemplar projects can be viewed as a lasting legacy of the VPH NoE. We are happy to announce that VPH2012 gives you an opportunity to see some of these outstanding results:

- A multi-nephron model of whole-kidney function for simulation of renal pathologies and blood pressure regulation by Moss *et al.* **(EP1)** – Multiscale applications session, Day 1 (18 September)

- seedEP2: Integrated modelling of musculoskeletal system by Van Sint Jan *et al.* **(EP2)** – Musculo-skeletal modelling session, Day 1

- Multiple systems ontology model of the lower limb by Bonnechère *et a.l* **(EP2)** – Image data and visualisation session, Day 3 (20 September)

- A-model, a deep look into the atherogenesis onset by Gomez-Cabrero *et al.* **(EP3)** – Vasculature session, Day 1

- Multiscale simulation and prediction of drug-induced cardiotoxicity: Integrating molecular, cellular and tissular levels by Obiol-Pardo *et al.* **(EP4)** – Cardiac electro-mechanical models session, Day 2 (19 September)

- Ontology-based knowledge management : RICORDO and ApiNATOMY by de Bono *et al.* **(EP6)** – Predictions and pharmacology session, Day 3

- A toolbox for causally cohesive genotype-phenotype modelling by Vik *et al.* **(EP7)** – Predictions and pharmacology session, Day 3

- Virtual experiments for reusable models by Cooper *et al.* **(EP7)** – VPH data and information session, Day 2

- Building a shared data infrastructure: a narrative by Varma *et al.* **(EP8)** – Data and computing infrastructures session II, Day 2

- EP9: A virtual imaging platform for the Virtual Physiological Human by Glatard *et al.* **(EP9)** – Image data and visualisation session, Day 3

- Multiscale modelling of Chlamydia trachomatis infection by Sutton *et al.* **(EP10)** - Immune System session II, Day 2

- Vascular tissue modelling environment by Owen *et al.* **(EP11)** – Cardiovascular modelling session, Day 1

Finally, we wish to give a big thank-you to the organizers of VPH2012; Miriam Mendes, Tara Chapman and Katherine Fletcher. Special mention should be given to Katherine Fletcher who also co-ordinated and organised the Scientific Programme. We would like to thank the reviewers of VPH2012 for their hard work and enthusiasm and finally we thank you, the VPH community, for continuing to support the endeavours of the VPH NoE to bring together all manner of people from different fields ranging from industrial personnel, to politicians, scientists, clinicians, researchers and many more to participate in this grand and exciting challenge to create the Virtual Physiological Human.

We hope you have a very successful and enjoyable conference.

The VPH2012 Scientific (Organising) Committee:

Peter Coveney (Chair), University
College London, UK
Vanessa Diaz (Vice-Chair), University College London, UK
Stephen Emmott, Microsoft Research Laboratory, UK
Norbert Graf, University of Saarland, DE
Peter Hunter, University of Auckland, NZ
Paul Kellam, Wellcome Trust Sanger Institute, UK
Peter Kohl, Imperial College London, UK
Ferran Sanz, Universitat Pompeu Fabra, ES
Jesper Tegner, Karolinska Institutet, SE
Marco Viceconti, University of Sheffield, UK

Conference Programme

Day 1 – Tuesday, 18 September

09:00 **Welcome to VPH2012** – Lecture Theatre

Keynote lecture: Salvador Moncada
Connecting cell cycle progression to metabolic requirements

10:00 **Respiratory modelling** – Lecture Theatre

Neurology and vascular applications – Siemens Room

Cardiovascular modelling – Thompson Room

Vasculature – Mountbatten Room

Sessional Workshop: *Cardiovascular applications and medical device design and assessment (MeDDiCA)* (10:00 – 18:00) – Council Chamber (c.bonacasas@uva.nl)

11:20 **Coffee break**

11:35 **Musculo-skeletal modelling** – Lecture Theatre

Neurological applications – Siemens Room

Multiscale modelling applications – Thompson Room

Multiscale applications – Mountbatten Room

13:00 **Lunch**

14:00 **Keynote lecture** – Lecture Theatre

Peter Hunter, Vanessa Diaz, Keith McCormack, Marco Viceconti
The VPH and the NoE

14:50 **Multiscale techniques and applications** – Lecture Theatre

Personalised medicine – Mountbatten Room

Sessional Workshop: *Modelling for patient safety* (14:50 – 18:00) – Siemens Room (gabriele.dubini@polimi.it)

Hands-on Workshop: *High performance atomistic simulations of physiological processes* (14:50 – 18:00) – Thompson Room (rossen@kth.se)

16:05 **Coffee break**

16:20 **Workflows** – Lecture Theatre

Data fusion – Mountbatten Room

Day 2 – Wednesday, 19 September

09:00 **Keynote lecture** – Lecture Theatre

Raimond L Winslow
Translational aspects of VPH

09:50 **Cardiac electro-mechanical models** – Lecture Theatre

Data and computing infrastructures I – Siemens Room

Hands-on Workshop: *VPHOP: Multiscale modelling of the skeleton to predict the risk of fracture in osteoporotic elders* (09:50 – 14:15) – Council Chamber (m.viceconti@sheffield.ac.uk)

Hands-on Workshop: *RICORDO: Semantic interoperability for clinical data and VPH models* (09:50 – 14:15) – Thompson Room (bdb@ebi.ac.uk)

11:20 **Coffee break**

11:35 **Cardiovascular models: mathematical approaches** – Lecture Theatre

Data and computing infrastructures II – Siemens Room

12:20 **Signalling and pathways** – Siemens Room

13:00 **Lunch**

14:00 **Physiome: Cardiac architecture and activity** – Lecture Theatre

Immune system I – Siemens Room

14:20 **Tools for translational studies** – Council Chamber

Integrating data sources – Thompson Room

15:20 **Keynote lecture** – Lecture Theatre

Douglas Kell
Pharmaceutical drug transport: The issues and the implications that it is essentially carrier-mediated only

16:05 **Coffee break**

16:20 **VPH data and information** – Lecture Theatre

Immune system II – Siemens Room

Musculo-skeletal applications – Council Chamber

Oncology – Thompson Room

19:30 **Conference dinner** – Riverside Room (third floor)

Day 3 – Thursday, 20 September

09:00   **Keynote lecture** – Lecture Theatre

Hiroaki Kitano
VPH in industrial research

09:50   **VPH Infrastructures: looking ahead –** Lecture Theatre

Predictions and pharmacology – Mountbatten Room

Sessional Workshop: *The mathematics of multiscale modelling* (09:50 – 13:30) – Thompson Room (martin.nelson@nottingham.ac.uk)

Hands-on Workshop: *VPH-SHARE: Sharing data, tools and models for workflows in biomedical research* (09:50 – 13:30) – Council Chamber (d.testi@scsitaly.com)

11:20   **Coffee break**

11:35   **Image data and visualisation –** Lecture Theatre

Diseases and diseaseomes – Mountbatten Room

14:00   *Satellite Session:* *Science as an open enterprise. Towards Open Science: EUDAT for the VPH Community* – Council Chamber
Contact: Riam Kanso (riam.kanso@sjc.ox.ac.uk)

Friday, 21 September 2012

09:00   *Satellite Meeting:* *Tech2012: Workshop on the VPH ToolKit and portal*
JZ Young Lecture Theatre, UCL Anatomy Building
Gower Street, WC1E 6BT
Contact: keith.mccormack@sheffield.ac.uk
Register: http://noe-toolkit.eventbrite.co.uk/

Conference tracks at a glance

Tracks

Physiome: multiscale modelling of physiology and pathology
VPH Infrastructures
Systems Medicine / -omics
VPH in Translation

Day 1 - Tuesday, 18 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room	Second floor Mountbatten Room
09 : 00 : 05 : 10	**Welcome to VPH2012** Peter Coveney				
: 15 : 20 : 25 : 30 : 35 : 40 : 45 : 50 : 55	**Keynote lecture: Salvador Moncada** Wolfson Institute for Biomedical Research, University College London *Connecting cell cycle progression to metabolic requirements*				
	Respiratory modelling Chair: Peter Hunter	**Neurology and vascular applications** Chair: Rod Hose	**Sessional Workshop** Cardiovascular applications and medical device design and assessment (MeDDiCA)	**Cardiovascular modelling** Chair: Norbert Graf	**Vasculature** Chair: Filippo Castiglione
10 : 00	Intro/Admin	Intro/Admin	Intro/Admin	Intro/Admin	Intro/Admin
: 05 : 10 : 15 : 20	*An Integrated Multi-Scale Multi-Physics Computational Model of the Respiratory System* Alexopoulos et al, abstract 45	*Identification of mechanistic differences in a virtual population … variation in response to simulated statin therapy* Wahba et al, abstract 71		*Modelling blood flow and metabolism in the preclinical neonatal brain during physiological insults* Hapuarachchi et al, abstract 53	*Patient-specific prediction of coronary plaque growth from CTA angiography: a multiscale model…* Vozzi et al, abstract 22
: 25 : 30 : 35 : 40	*SYNERGY-COPD: Abnormal O_2 transport/0_2 utilisation leads to high mitochondiral ROS generation…* Cano et al, abstract 125	*An automated procedure… to evaluate risk on abdominal aortic aneurysm* Lotti et al, abstract 96	**Workshop** MeDDiCA	*Estimating changes to brain oxygenation delivery through multi-scale modelling of the cerebral microvasculature* Park et al, abstract 77	*Multiscale Simulation on the initial stage of thrombus growth* Takagi et al, abstract 120
: 45 : 50 : 55 11 : 00	*Computational models of the airways to unravel the pathophysiological mechanisms in asthma and COPD…* Burrowes et al, abstract 89	*Modelling the transport behaviour of platelets in intracranial aneurysms* Mountrakis et al, abstract 88		*Cardiovascular flow simulation by correlation based optical flow* Otsuki et al, abstract 105	*A multiscale mechanobiological model of in-stent restenosis* Zahedmanesh et al, abstract 86
: 05 : 10 : 15 : 20	*Mathematical model of ion transport in human nasal epithelia: ….Cystic Fibrosis…* O'Donoghue et al, abstract 97	*Differentiating pathological brain atrophy from normal aging: promising diagnostic…* Lorenzi et al, abstract 122		*Vascular tissue modelling environment* Owen et al, abstract 9	*A-model, a deep look into the atherogenesis onset* Gomez-Cabrero et al, abstract 95
: 25 : 30	Coffee	Coffee	Coffee	Coffee	Coffee
	Musculo-skeletal modelling Chair: Marco Viceconti	**Neurological applications** Chair: Norbert Graf		**Multiscale modelling applications** David Gavaghan	**Multiscale applications** Chair: S Randall Thomas
: 35 : 40 : 45	*seedEP2 : Integrated modelling of the musculoskeletal system* Van Sint Jan et al, abstract 104	*PredictAD – From Patient Data to Personalised Healthcare in Alzheimer's Disease* Lötjönen et al, abstract 113		*A multiscale model of sprouting angiogenesis during fracture healing* Carlier et al, abstract 28	*A multi-nephron model of whole-kidney function…* Moss et al, abstract 58
: 50 : 55 12 : 00	*A novel active lumbar spine muscle model* Toumanidou et al, abstract 117	*Generic evidence-based disease profiling for predicting outcomes: … Alzheimer's and Traumatic Brain Injuries* Lötjönen et al, abstract 116	**Workshop** MeDDiCA	*Multi-scale biomechanical modeling and energy loss evaluation of aortic aneurysm* Liu et al, abstract 103	*Validation of patient specific multi-scale hemodynamic model for planning vascular access surgery in hemodialysis patients* Manini et al, abstract 33
: 05 : 10 : 15 : 20	*Mechanical effect on cell viability in healthy and degenerated intervertebral discs* Malandrino et al, abstract 50	*Wave transmission in 3-dimensional non-homogeneous viscoelastic brain model* Boccia et al, abstract 48		*Multiscale modelling of the interplay between global and local structural changes in viral drug target proteins* Wright et al, abstract 126	*Multi-scale modelling of epithelium homeostasis* Domínguez Hüttinger et al, abstract 65
: 25 : 30 : 35	*Simultaneous prediction of musculo-tendon, joint, ligament, and bone forces…* Dumas et al, abstract 14	*Modelling of the Physiological Response of the Brain to Stroke* Orlowski et al, abstract 108		*A spatially distributed approach of intraperitoneal fluid kinetics and transport through the interstitium…* Stachowska-Pietka et al, abstract 118	
: 40 : 45 : 50	*Mesh convergence is affected by poroelasticity in multi-tissue …* Ruiz et al, abstract 52			*[…]*	

Day 1 - Tuesday, 18 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room	Second floor Mountbatten Room
12 : 50			**Workshop** MeDDiCA	*Validated and optimised model linking muscle and pulmonary O $_2$ uptake kinetics*	
: 55				Benson et al, abstract 102	
13 : 00					
: 05					
: 10					
: 15					
: 20					
: 25					
: 30	Lunch	Lunch	Lunch	Lunch	Lunch
: 35					
: 40					
: 45					
: 50					
: 55					
14 : 00					
: 05	**Keynote lecture:** **Peter Hunter, Vanessa Diaz** **Keith McCormack, Marco Viceconti**				
: 10					
: 15					
: 20					
: 25	VPH Network of Excellence / VPH Institute				
: 30					
: 35	*The VPH and the NoE*				
: 40					
: 45	Chair: Peter Coveney				
	Multiscale techniques and applications. Chair: Emanuela Merelli	**Sessional Workshop** Modelling for patient safety	**Sessional Workshop** Cardiovascular applications and medical device design and assessment (MeDDiCA)	**Hands-on Workshop** High performance atomistic simulations of physiological processes	**Personalised medicine** Chair: Nour Shublaq
: 50	*MultiScale exemplary problems*				*Integration of knowledge for personalized medicine: a pharmacogenomics case-study*
: 55					
15 : 00	Planes et al, abstract 37				Hoehndorf et al, abstract 13
: 05	*Discrete-continuous mathematical modeling of endocrine systems…*				*p-medicine – … data sharing and integration …to personalized medicine*
: 10					
: 15					
: 20	Medvedev et al, abstract 107	**Workshop** Modelling for patient safety	**Workshop** MeDDiCA	**Workshop** High-performance atomistic simulations	Graf et al, abstract 81
: 25					
: 30	*Multiscale modeling of insulin secretion*				*Challenges in data warehousing for personalised medicine*
: 35					
: 40	Pedersen et al, abstract 142				Jefferys et al, abstract 110
: 45	*Integration of glucose and lipid metabolism: In silico models of adipose tissue and blood*				*VPH-Share: embodying a patient avatar for computational workflows*
: 50					
: 55					
16 : 00	Li et al, abstract 61				Varma et al, abstract 128
: 05					
: 10	Coffee	Coffee	Coffee	Coffee	Coffee
: 15					
	Workflows Chair: Peter Coveney	**Workshop** Modelling for patient safety	**Workshop** MeDDiCA	**Workshop** High-performance atomistic simulations	**Data fusion** Chair: Nour Shublaq
: 20	*Composition and migration to the cloud of the @neurIST workflow in VPH-Share*				*Relating … breast MR images and X-ray mammograms: a validation study*
: 25					
: 30	Villa-Uriol et al, abstract 141				Mertzanidou et al, abstract 25

Day 1 - Tuesday, 18 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room	Second floor Mountbatten Room
16 : 35	*Developing a workflow system that integrates scientific development* Silva et al, abstract 2				*A Horizontal Data Fusion Toolbox: putting the focus on interoperability* Bleuze et al, abstract 129
: 40					
: 45					
: 50	*A case study demonstrating VPH-NoE guideline compliance: … a graphical tool* Evison et al, abstract 51				*Software framework for reconstructing proximal femur from dual-energy x-ray absorptiometry and assessing fracture risk* Martelli et al: abstract 41
: 55					
17 : 00					
: 05	*VPH-Share: Patient-centred multi-scale computational workflows* Varma et al, abstract 131				
: 10		**Workshop** Modelling for patient safety	**Workshop** MeDDiCA	**Workshop** High-performance atomistic simulations	*Advantage of a patient-specific respiratory motion model for the liver* Samei et al: abstract 114
: 15					
: 20	*Neuroswarm: …constraints of simulation parameters in large-scale networks of biological neurons* Gomez-Cabrero et al, abstract 92				
: 25					
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18 : 00					

Day 2 - Wednesday, 19 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room
09 : 00	Intro/Admin			
: 05				
: 10	**Keynote lecture: Raimond L Winslow**			
: 15				
: 20	Director, Institute for Computational			
: 25	Medicine, Johns Hopkins University			
: 30				
: 35	*Translational aspects of VPH*			
: 40				
: 45			**Hands-on Workshop**	**Hands-on Workshop**
	Cardiac electro-mechanical models Chair: Peter Kohl	**Data and computing infrastructures I** Chair: Ryutaro Himeno	Multiscale modelling of the skeleton to predict fracture risk in osteoporotic elders	RICORDO: Semantic interoperability for clinical data and VPH models
: 50	Intro/Admin	Intro/Admin	Intro/Admin	Intro/Admin
: 55	*Multiscale simulation and prediction of drug-induced cardiotoxicity…*	*Towards a European collaborative data infrastructure*		
10 : 00				
: 05	Obiol-Pardo et al, abstract 69	Vicente et al, abstract 32		
: 10	*Interactive electromechanical model of the heart for patient-specific therapy planning and training using SOFA*	*Sim4Life: A medical image data based multi-physics simulation platform for computational life sciences*		
: 15				
: 20				
: 25	Talbot et al, abstract 63	Neufeld et al, abstract 43	**Workshop** VPHOP	**Workshop** Semantic Interoperability
: 30	*Functional effects of short QT syndrome gene mutations: electrical & mechanical…*			
: 35		*AHE and ACD: A gateway into the grid infrastructure for VPH-Share*		
: 40	Adeniran et al, abstract 72			
: 45				
: 50	*Shock-induced arrhythmogenesis in the human heart: a simulation study*	Chang et al, abstract 35		
: 55				
11 : 00	Bernabeu et al, abstract 133	*A distributed infrastructure for multiscale biomedical simulations*		
: 05	*A mathematical model of the electrical and mechanical activity of the uterine cell*			
: 10		Groen et al, abstract 18		
: 15	Testrow et al, abstract 74			
: 20	Coffee	Coffee	Coffee	Coffee
: 25				
: 30				

Day 2 - Wednesday, 19 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room
	Cardiovascular models: mathematical approaches. Chair: Emanuela Merelli	**Data and computing infrastructures II** Chair: Ryutaro Himeno		
11 : 35 : 40 : 45 : 50	*Towards quantifying the impact of blood rheology model on shear stress estimates throughout the cardiac cycle* Bernabeu et al, abstract 36	*Building a shared data infrastructure: a narrative* Varma et al, abstract 78		
: 55 : 00 : 05 : 10	*Multi-scale integrative computational model of pulmonary veins: studying arrhythmogenic substrate for AF* Aslanidi et al, abstract 39	*EUDAT: a collaborative data infrastructure supporting the VPH initiative* Haidar et al, abstract 91	**Workshop** VPHOP	**Workshop** Semantic Interoperability
12 : 15 : 20 : 25	*Integrative model of heart and coronary circulation: … effect of coronary occlusion* Shim et al, abstract 134	**Signalling and pathways** Chair: Hans Westerhoff		
: 30 : 35 : 40	*3D Bidomain modeling of cardiac virtual electrode pacing* Pavarino et al,abstract 106	*Multiscale modelling of delta-notch pathways* Tankaria et al, abstract 31		
: 45 : 50 : 55	*GPGPU accelerated cardiac electrophysiology in the human heart*	*Multiscale modelling of P2Y11, a receptor involved in heteromeric GPCR signal* Koss et al, abstract 121		
13 : 00	Vigueras et al, abstract 66			
: 05 : 10 : 15 : 20 : 25 : 30 : 35 : 40 : 45 : 50 : 55	Lunch	Lunch	Lunch	Lunch
	Physiome: Cardiac architecture & activity Chair: Peter Kohl	**Immune system I** Chair: Bindi Brook		
14 : 00 : 05 : 10 : 15	*Developing a Virtual Physiological Mouse model of the heart: multi-scale coupling is key for controlling ventricular pressure* Land et al, abstract 109	*The immune system as a biomonitor : explorations in innate and adaptive immunity* Chain et al, abstract 84	**Workshop** VPHOP	**Workshop** Semantic Interoperability

Day 2 - Wednesday, 19 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room
14 : 20 : 25 : 30 : 35 : 40 : 45 : 50 : 55 15 : 00 : 05 : 10 : 15	*Architecture, antenatal activity and arrhythmia of the human foetal heart: a computational database* Pervolaraki et al, abstract 75 *Multi-scale integrative computational model the human atria and torso: platform for investigation of AF* Colman et al, abstract 73 *Development of a 3D computational sheep atria for the study of atrial fibrillation* Butters et al, abstract 55	*Comparing the effects of viral (HIV) and bacterial infection (Staph A) in bone* Lio' et al, abstract 115 *Elucidating the origin of resistance in HIV-1 protease using atomistic simulation* Hall et al, abstract 127	**Tools for translational studies** Chair: Norbert Graf *Hypermodelling technology for multiscale simulations* Testi et al, abstract 23 *ObTiMA - an ontology-based application for managing clinico-genomic trials* Stenzhorn et al, abstract 79 *A collaborative online system dedicated to the study of intracranial aneurysms* Courbebaisse et al, abstract 16	**Integrating data sources** Chair: Nour Shublaq *Access to reaction kinetics data: The SABIO-RK database* Golebiewski et al, abstract 119 *Discovering model-model connections in biological model repositories* Gennari et al, abstract 135 *The TUMOR project: integrating cancer model repositories ... predictive oncology* Sakkalis et al, abstract 99
15 : 20 : 25 : 30 : 35 : 40 : 45 : 50 : 55 16 : 00	**Keynote lecture: Douglas Kell** Chief Executive, Biotechnology and Biological Sciences Research Council *Pharmaceutical drug transport: The issues and the implications that it is essentially carrier-mediated only*			
: 05 : 10 : 15	Coffee	Coffee	Coffee	Coffee
 : 20 : 25 : 30 : 35 : 40 : 45 : 50 : 55 17 : 00	**VPH data and information** Chair: Vanessa Diaz *Virtual experiments for reusable models* Cooper et al, abstract 101 *VPH2: Extracting knowledge from integrated data* Carenini et al, abstract 3 *Sensitivity analysis and parameter estimation: triple vessel disease circulation* Ojeda et al, abstract 124	**Immune system II** Chair: Bindi Brook *HIV reservoirs & immune surveillance evasion cause failure of ... treatment interruptions: in silico clinical trial* Mancini et al, abstract 21 *Multiscale modelling of Chlamydia trachomatis infection* Sutton et al, abstract 100	**Musculo-skeletal applications** Chair: Marco Viceconti *Subject-specific bone mechanical properties:... alternative to X-rays…* Mitton et al, abstract 90 *Fibre-based models of muscle wrapping* Kohout et al, abstract 19 *Technologies for modelling fibrous muscle muscle in motion […]*	**Oncology** Chair: Filippo Castiglione *Integrated analysis of copy number aberrations for primary breast cancer* Winchester et al, abstract 76 *Colorectal crypt formation in vitro & in silico: ... tissue-scale buckling* Nelson et al, abstract 24 *In silico oncology: boundary conditions imposed by the skull in glioblastoma* Stamatakos et al, abstract 4

Day 2 - Wednesday, 19 September, 2012

Time	Ground floor Lecture Theatre	Ground floor Siemens Room	Second floor Council Chamber	Second floor Thompson Room
17 : 05			*..modelling fibrous muscle in motion*	
: 10	*Three Band Analysis in FSI model of aorta*		Kohout et al, abstract 20	
: 15				
: 20	Nestola et al, abstract 49		*A Digital Patient for prosthesis design*	
: 25				
: 30			Colombo et al, abstract 29	
: 35				
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: 45				
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: 55				
18 : 00				
	[…]			
19 : 30		Conference dinner: Riverside Room (third floor)		

Day 3 - Thursday, 20 September, 2012

Time	Ground floor **Lecture Theatre**	Second floor **Thompson Room**	Second floor **Council Chamber**	Second floor **Mountbatten Room**
09 : 00	Intro/Admin			
: 05	**Keynote lecture: Hiroaki Kitano** President, The Systems Biology Institute, Japan Principal Investigator, Okinawa Institute of Science and Technology *VPH in industrial research*			
: 10				
: 15				
: 20				
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: 30				
: 35				
: 40				
: 45	**VPH Infrastructures: looking ahead** Chair: Peter Coveney	**Sessional Workshop** The mathematics of multiscale modelling	**Hands-on Workshop** VPH-SHARE: Sharing data, tools and models for workflows in biomedical research	**Predictions and pharmacology** Chair: Adriano Henney
: 50	Intro/Admin			Intro/Admin
: 55	*Multi-institutional graduate programme for Virtual Physiological Human scientists (VPH-MIP)*			*Ontology-based knowledge management: RICORDO and ApiNATOMY* de Bono et al, abstract 68
10 : 00				
: 05				
: 10	Feipel et al, abstract 111			*A Quantitative Systems Pharmacology model of NGF pathway to aid drug discovery and development* Dua et al, abstract 70
: 15	*VPH tools in clinical education: development of an Education Engine*			
: 20				
: 25				
: 30	Bayley at al, abstract 27	**Workshop** Mathematics of multiscale modelling	**Workshop** VPH-SHARE	*Application of integrative modelling to the clinical development of FAAH inhibitors* Benson et al, abstract 15
: 35	*A 'Digital Me': key to implementation*			
: 40				
: 45	Shublaq et al, abstract 93			*Predicting rebound for mAbs using the TMDD model*
: 50	*Building sustainable capacity for research for health in Africa: AFRICA BUILD project*			
: 55				
11 : 00	Jimenez-Castellanos et al, abstract 46			Derks et al, abstract 139
: 05	*A vision for supporting future VPH activities through VPH NoE resources*			*A toolbox for causally cohesive genotype- phenotype modeling*
: 10				
: 15	Bayley et al, abstract 62			Vik et al, abstract 112
: 20				
: 25	Coffee	Coffee	Coffee	Coffee
: 30				

Day 3 - Thursday, 20 September, 2012

Time	Ground floor **Lecture Theatre**	Second floor **Thompson Room**	Second floor **Council Chamber**	Second floor **Mountbatten Room**
	Image data and visualisation Chair: Rod Hose			**Diseases and diseaseomes** Chair: Adriano Henney
11 : 35	*Best practice for multiscale visualisation in VPH*			*A translational medicine approach to orphan diseases*
: 40				
: 45	Ma et al, abstract 57			Hoehndorf et al, abstract 12
: 50	*A virtual imaging platform for the Virtual*			
: 55	*Physiological Human*			*Modelling progressive metabolic diseases*
12 : 00	Glatard et al, abstract 64			*with parameter transition trajectories*
: 05	*VPH challenges: a solution to interactive*			van Riel et al, abstract 47
: 10	*visualisation of biomedical data*			
: 15	Testi et al, abstract 26	**Workshop**	**Workshop**	*Relationship between hypertension and*
: 20	*Spatial and temporal multiscale interactive*	Mathematics of multiscale modelling	VPH-SHARE	*age-related baroreflex dysfunction*
: 25	*visualization: two prototypes*			Pettersen et al, abstract 34
: 30	Testi et al, abstract 87			*Exploring the diseasome of COPD and its*
: 35	*The 'Virtual Population': detailed, whole-*			*associated diseases*
: 40	*body models from medical image data*			Grosdidier et al, abstract 42
: 45	Neufeld et al, abstract 38			*Visualisation and target prioritisation*
: 50	*From foundational to functional … multiple*			*using compuational and experimental*
: 55	*systems ontology model of the lower limb*			Lees et al, abstract 11
13 : 00	Bonnechère et al, abstract 98			*A tool for training effective classifiers in*
: 05				*the small sample setting*
: 10				Anguita et al, abstract 56
: 15				
: 20				
: 25				
: 30				
[…]				
14 : 00			**Satellite meeting** EUDAT: Towards a collaborative data infrastructure	

Friday, 21 September, 2012

09 : 00	**Satellite meeting** Tech2012: VPH ToolKit and web portal *J Z Young Lecture Theatre, UCL Anatomy Building, Gower Street*

Sessional Workshop

Cardiovascular applications and medical device design and assessment (MeDDiCA)

Day 1 – 10:00 – 18:00 – Council Chamber

Workshop overview

This workshop targets young researchers with a focus on cardiovascular applications and medical device design and assessment. A multi-disciplinary approach will be adopted, with experimental and numerical topics included. The uniqueness of this session is that the workshop aims at encouraging young talents to join the VPH initiative, with a call for submissions from young researchers (PhD and early postdocs) only.

The workshop will be open to all: experts in the field, industry representatives and clinicians are encouraged to participate in the discussions. The presentations will provide an overview of current research status, and the following discussions will elucidate future challenges.

Workshop Theme and Topics

The workshop focuses on cardiovascular applications and medical device design and assessment, including (but not limited to):
- Devices: stents, heart valves, balloon catheters, left ventricular assist devices;
- Associated clinical/biological effects: in-stent restenosis, thrombosis;
- Experimental/numerical techniques: multi-scale modeling, 3D numerical simulation, in vitro and ex vivo laboratory models and/or experimentation.

Workshop topics include (but are not limited to) the following:
- Cardiovascular Stenting;
- Tissue deformation and tissue growth;
- Left ventricular assist devices;
- Catheter design;
- Thrombus formation;
- Hemodynamics in complex patient-specific geometries;
- Heart valve dynamics
- Percutaneous implantation of valve devices

Contact: c.bonacasas@uva.nl

MeDDiCA workshop programme

10:00 - 10:30 - Roberto Ghidini: *Industrial issues associated with translation of research relating to medical devices*

10:30 - 10:45 - Sajjad Soleimani: *Effects of applied pressure and clot viscosity on aspiration catheter performance*

10:45 - 11:00 - Selim Bozkurt: *Improving the Pulsatility in a CF-LVAD Supported Cardiovascular System Applying a Model Control to CF-LVAD Flow Rate*

11:00 - 11:15 - Daria Cosentino: *Risk stratification for stent fracture prediction in percutaneous pulmonary valve implantation through patient-specific finite element analysis*

11:15 - 11:30 - COFFEE BREAK

11:30 - 12:00 - Antonio Amodeo: *From simulations and animal models to clinical recommendations: when we will trust the computers?*

12:00 - 12:15 - Rajeev Kumar Nallamothu: *A Multi-physics model of the Ventricular valve-valve interaction*

12:15 - 12:30 - Yan Li: *Experimental and numerical simulation study of the near-hinge flow field of a bileaflet mechanical heart valve*

12:30 - 12:45 - Benjamin Bhattacharya-Ghosh: *From Cell to Heart: A Multi-scale Lumped Parameter Model of the Cardiovascular System*

12:45 - 13:00 - Eun Bo Shim: *Patient-Specific Identification of Optimal Placement of Ubiquitous ECG using a 3D Heart Model*

13:00 - 14:00 - LUNCH

14:00 - 14:45 - KEYNOTE LECTURE (see main conference schedule)

14:45 - 15:15 - Paul Watton: *Computational Fluid Dynamics in Medical Research: Critical Reflections, Future Directions*

15:15 - 15:30 - Alisa Selimovic: *Investigating the correlation between pulsatile-flow hemodynamics and aneurysm growth: a patient-specific, CFD study*

15:30 - 15:45 - Kristof Ralovich: *Hemodynamic Assessment of Aortic Coarctation from MR Images*

15:45 - 16:00 - Guanglei Wang: *Analysis of local and global Hemolysis Index in 2D velocity field of regurgitant flow in mechanical heart valve*

16:00 - 16:15 - COFFEE BREAK

16:15 - 16:30 - Claudia Amatruda, Brandis Keller: *Contribution of mechanical and fluid response to in-stent restenosis*

16:30 - 16:45 - Iolanda Decorato: *Simulation of the fluid-structure interactions after balloon-angioplasty and stenting treatment in a stenosed arteriovenous fistula geometry*

16:45 - 17:00 - Hannan Tahir: *Modelling the influence of re-endothelialization on in-stent restenosis*

17:00 - 17:15 - Iwona Zwierzak: *Three dimensional optical reconstruction method for stent geometry characterisation; data validation using micro CT technique*

17:15 - 17:30 - Kateryna Spranger: *Comparison of computational methods for simulating stent deployment*

17:30 - 18:00 - Concluding remarks and future perspectives discussion.

Sessional Workshop

The Mathematics of Multiscale Modelling
Day 3 – 09:50 – 13:30 – Siemens Room

Workshop overview

This workshop will examine fundamental mathematical techniques which underpin multiscale modelling of the VPH, highlighting novel modelling approaches, recent successes and current challenges. The workshop targets researchers of both mathematical and nonmathematical backgrounds, including leading mathematicians with no previous exposure to VPH-related questions as well as VPH experts, promoting future collaborations between these communities.

Workshop Theme and Topics

- Fundamental mathematical techniques in multiscale modelling for the VPH;
- Homogenisation across multiple spatial scales;
- Asymptotic analysis and its application to multiple timescale problems;
- Associated mathematical techniques for model integration over multiple spatio-temporal scales, including for hybrid (stochastic/deterministic, discrete/continuous) modelling approaches.

The workshop will seek to span scales from gene, signalling and metabolic networks up to tissue and organ levels.

Contact: martin.nelson@nottingham.ac.uk

Workshop: Mathematics of Multiscale Modelling

Day 3 - Thursday, 20 September, 2012 - Siemens Room

Time	Type	Speaker	Title
09 : 45	Introduction		
: 50			
: 55			
10 : 00	Plenary Talk	Christian Schmeiser	Microscopic-stochastic vs. macroscopic-continuum modeling of lamellipodium dynamics
: 05			
: 10			
: 15			
: 20			
: 25	Contributed Talk	Julia Mikhal	Development of an Immersed Boundary Method for Pulsatile Flow Predictions in Cerebral Aneurysms
: 30			
: 35			
: 40			
: 45			
: 50	Plenary Talk	Markus Owen	Partial differential equation and hybrid multiscale models for cancer immunotherapy
: 55			
11 : 00			
: 05			
: 10			
: 15			
: 20	Coffee		
: 25			
: 30			
: 35	Contributed Talk	Oliver Roehrle	A Novel Mathematical Homogenisation Technique to Link Tissue Scale Properties of the Intervertebral Disc to Whole Organ
: 40			
: 45			
: 50			
: 55			
12 : 00			
: 05	Plenary Talk	Joe Dunster	Unravelling the coagulation cascade
: 10			
: 15			
: 20			
: 25	Contributed Talk	Tariq Abdulla	Hybrid Modelling of in vitro Epithelial to Mesenchymal Transition
: 30			
: 35			
: 40			
: 45	Contributed Talk	Gerardo Tauriello	Multiscale Simulations of Morphogenesis
: 50			
: 55			
13 : 00			
: 05			
: 10	Plenary Talk	Benoit Perthame	Kinetic models of chemotaxis and traveling bands
: 15			
: 20			
: 25			
: 30	Finish		

Sessional Workshop

Modelling for patient safety
Day 1 – 14:50 – 18:00 – Siemens Room

Workshop overview

The last two decades have witnessed the development of accurate biomechanical models describing blood vessel mechanics. A new challenge is the exploitation of this knowledge to provide the clinician with technological tools for planning and monitoring of interventional procedures and to increase safety in the use of medical devices in clinical procedures.

In order to achieve this ambitious goal European research must have a spectrum of coordinated initiatives. This Workshop exploits the VPH framework in order to continue the discussion on the definition of new paradigms and new challenges for research in this field.

Workshop Theme and Topics

Amongst recent new trends in clinical care, minimally-invasive medicine has been a major driver of the development of percutaneous procedures and percutaneously-deliverable devices and implants. Interventional cardiology and neuro-interventional surgery are areas where major technological advancements have been made in this respect, with an impressive impact on the quality of care. Progressive adoption of less invasive procedures has reduced access trauma, minimising pain and hospitalisation periods, and also has significant effects on the costs charged to the health care providers. On the other hand, control of the procedure in terms of deliverability, correct deployment and postoperative performance assessment of the device has become a major issue in terms of reducing potential risks for the patient.

Main themes: Identification of future paradigms and challenges for the application of simulation technologies in interventional procedures:
- Investigation of the interaction between the device - and the delivery system components - and the patient both during and after the procedure;
- Assessment of the level of potential damage to the patient's tissues and structures (e.g. the artery walls and the surrounding tissue);
- Definition of quantitative indicators for improving quality and safety of the interventional procedures;
- Identification of the best strategies for the development and calculation of safety indices, biomechanical and functional models in real-time during the interventional procedure.

Contact: gabriele.dubini@polimi.it

Hands-on Workshop

High performance atomistic simulations of physiological processes
Day 1 – 14:50 – 18:00 – Thompson Room

Workshop overview

The workshop addresses the fast growing demand the Life Sciences put on the capabilities of simulation software and the capacity of this to perform life-realistic simulations. The workshop will present state-of-the-art computational methods for the simulation of biological molecules using three software packages: Dalton (QM), Gromacs (MD) and Discrete (CG). The emphasis will be on both the simulation capacity of these packages and the possibilities they bring to the Life Sciences research as well as on their efficient usage on High Performance supercomputer systems.

Workshop Theme and Topics

Efficient simulation of physiological processes at atomistic level on HPC:
- QM and hybrid-QM/MM techniques
- Molecular dynamics methods
- Coarse-grained approaches

Contact: rossen@kth.se

Hands-on Workshop

VPH-SHARE: Sharing data, tools and models for workflows in biomedical research

Day 3 – 09:50 – 13:30 – Council Chamber

Workshop overview

The workshop aims to reach out to potential end-users of the first important outcomes of the VPH-Share Integrated Project (http://www.vph-share.eu), a large-scale VPH project funded in FP7. VPH-Share aims to develop an infostructure to expose and share data and knowledge within the VPH community, and to jointly develop multiscale models for the composition of new VPH workflows. During its first years of activity the VPH-Share consortium will develop the important ICT and technical components of the new infostructure. The services will be exposed outside the consortium by integrating them with the already operational PhysiomeSpace data sharing service (www.physiomespace.com).

Besides data sharing, the VPH-Share infostructure will increase collaboration in the VPH community by providing also services to share and use fundamental VPH modelling components making them available for the composition of new biomedical workflows. The involvement of the VPH community in using this new infostructure is relevant not only to the VPH-Share project, but also to the community itself as it will provide a useful system to start sharing and building new knowledge.

Workshop Theme and Topics

Biomedical data, tools and model sharing, VPH workflows composition and execution, multiscale modelling.

Contact: d.testi@scsitaly.com

Hands-on Workshop

RICORDO: Semantic interoperability for clinical data and VPH models

Day 2 – 09:50-14:15 – Thompson Room

Workshop overview

The first two hours of the workshop will take the form of presentations, while the second half of the workshop is dedicated to hands-on training and software demonstrations.

Introduction: the challenges and importance of semantic interoperability for the VPH.

Introductory presentations: short presentations on specific aspects of the RICORDO work and contribution that will give the conceptual background for the hands-on session.

Hands on session: focused on acquiring an experience with the reference implementation of the RICORDO infrastructure, demonstrating deployment of the infrastructure and its capabilities, and prototype implementations of applications built on the framework (lead presenter: Sarala Wimalaratne).

Contact: bdb@ebi.ac.uk

Hands-on Workshop

VPHOP: Multiscale modelling of the skeleton to predict the risk of fractures in osteoporotic elders

Day 2 – 09:50-14:15 – Council Chamber

Workshop overview

The workshop aims to present the most important outcomes of the VPHOP Integrated Project, one of the first large-scale VPH projects funded in FP7. During its four years of activity the VPHOP consortium has been developing a personalised multiscale modelling technology that targets an understanding of the most important mechanobiological processes affecting the risk of the elderly to experience low-energy impact fractures. The personalised models account for the whole body, organ, tissue, and cellular level interactions, and are able to predict progressive changes to material properties, structure and ultimately fracture risk over time, and how pharmacological and interventional treatments might modify these risks. The modelling system is paired with a new generation of imaging and biomedical instrumentation technologies that are capable of collecting the most important information required for initialising personalised models. This system specifically works under the tight constraints required for clinical applications, which impose low radiation doses and moderate costs. From an information technology perspective, the VPHOP consortium has developed a hypermodel environment that is capable of wrapping heterogeneous modelling software packages into a single system for examining fracture risk, and execute them according to a user-defined workflow in a fully integrated fashion.

The workshop will also dedicate a presentation session to the early results of the NMS Physiome Project, the international collaboration between VPHOP and the American SIMBIOS (the NIH Center for Physics-based Simulation of Biological Structures) which aims to develop synergies in terms of tools, infrastructures, and research activities related to musculoskeletal predictive medicine.

Workshop Theme and Topics

Multiscale modelling of the musculoskeletal system, hypermodelling technologies.

Contact: m.viceconti@sheffield.ac.uk   www.vphop.eu

VPHOP workshop programme

09:50 - 10:10 Marco Viceconti, University of Sheffield: Project overview and primary achievements

10:10 - 10:45 Debora Testi, SCS srl: The VPHOP hypermodelling technology. Description and hands-on demonstration

10:45 - 11:00 Giordano Valente, Istituto Ortopedico Rizzoli: NMS Physiome: An integrated modelling environment for subject-specific musculoskeletal dynamics – LhpBuilder and OpenSim

11:00 - 11:15 Gordon Clapworthy, University of Bedfordshire: Towards automatic muscle volumetric wrapping in inverse dynamics musculoskeletal models

11:15 - 11:30 Coffee

11:30 - 11:45 Ralph Müller, ETH Zurich: Predicting disease progression and effect of pharma treatment

11:45 - 12:00 Stephen Ferguson, ETH Zurich: Predicting the reduction of the risk of bone fracture due to interventional treatment

12:00 - 12:15 Keita Ito, Technical University of Eindhoven: Bridging the tissue meso-scale combining patient information with tissue morphology databases

12:15 - 12:30 William Taylor, Julius Wolff Institute: Predicting skeletal loading using subject-specific anatomical and functional information

12:30 - 12:45 Enrico Schileo, Istituto Ortopedico Rizzoli: Using a personalised multiscale model to predict the risk of bone fracture in elderly patients: preclinical and   clinical validation

12:45 - 13:00 Rainer Thiel, Empirica: The socio-economic impact of the VPHOP technology: a preliminary cost-benefit analysis

13:00 - 14:00 Lunch

14:00 - 14:15 René Rizzoli, Université de Geneve: The last word: a clinical perspective on the VPHOP technology: strengths and limitations

Interactive Satellite Session

Science as an open enterprise
Towards open science: EUDAT for the VPH community

Day 3 – 2:00-3:00 – Council Chamber
To register, contact: riam.kanso@sjc.ox.ac.uk (lunch is provided for registered members)

The ability to question and probe data in an open and intelligent manner lies at the heart of the scientific enterprise, with substantial benefits for society and the economy. The European Commission (EC) has launched a wide-ranging open data initiative, opening its own stores of data through a new portal, and providing substantial funds to improve the way data is handled.

European Data Infrastructure project (EUDAT), part of the EC's Framework Programme 7, aims to contribute to the production of a Collaborative Data Infrastructure (CDI) for the VPH community, among other research communities. The challenges and difficulties of such an endeavour, from a technical, political, and legal perspective, are not trivial. The benefits, however, are becoming increasingly obvious.

Join us on this interactive networking session where active and future connections between VPH and EUDAT are explored. The session will include speakers from the VPH community who are exploring EUDAT services for their research data.

This session will provide the opportunity for VPH members in the audience to obtain information about EUDAT, drawing on the benefits and challenges presented in the talks and discussion.

Satellite Workshop

VPH NoE ToolKit - The still-throbbing heart of the VPH NoE Tech2012: ToolKit Annual Technical Meeting

Friday, 21 September (the day after VPH2012)

JZ Young Lecture Theatre, UCL Anatomy Building
Gower Street, WC1E 6BT
Contact: keith.mccormack@sheffield.ac.uk
Register: http://noe-toolkit.eventbrite.co.uk/ (attendance is free of charge)

Programme

08:30	*Registration*	
09:30	**Welcome & Introduction**	Peter Coveney, NoE Leader
09:40	**The GRID & Cloud - in minutes**	UCL makes it all clear
10:20	**Aspects of the Toolkit**	Oxford gives deep insights
11:00	*Coffee*	
11:15	**Image Processing, Interoperability**	The Imaging Team: CNRS, INRIA, UPF
12:45	*Lunch*	
13:45	**Molecular Simulation**	PSMAR exposes the magic
14:00	**Markup languages**	Auckland report on the future of MLs
14:40	**Semantics**	EBI: Annotation, annotation, annotation
15:20	*Coffee*	*…and a chance to plan that consortium*
15:50	**Data & Guidelines**	Sheffield says 'We all need data – here it is'
16:30	**Closing Remarks**	So long (and thanks for all the fish)

Why should I attend?

Delegate	Why come along?
VPH-I, NoE WP2/EPs	Your tools in the Kit; your project's destiny fulfilled, your project officer happy
Call 6 Infrastructure	We can help each other – cooperation towards a complete VPH service.
AMEE (Educators)	Meet the VPH team, learn about ToolKit details, develop interactions
NoE WP4	See what's new, meet AMEE the Educators, develop NoE training
NoE WP3	Ha! No choice, guys!
VPH colleagues	Learn more, meet the teams; it's free - get your VPH 2012 money's worth

2012 ToolKit Annual Meeting in Detail

Background

The Virtual Physiological Human Network of Excellence is the key focus for both the development of the VPH Community and the establishment of central resources, and it provides a welcoming fireside at which the new or curious, looking for a more satisfying destination for their physiological modelling interests, can warm their toes. Everyone in Europe who is involved in trying to understand the workings of human physiology belongs here.

The ToolKit

The VPH NoE ToolKit is the place to find everything you need to complete your modelling project. It's a central European repository for Tools, Models and Data that will provide the missing component to help you build your application. And when you're done it, it's the ideal repository in which to place your results, so that others can benefit. The NoE is working with large EC projects to create an environment in which collaborative working can thrive and models and data can be exchanged safely and securely.

Meeting Themes

This year's meeting gives you the chance to hear from each institution participating in the NoE's Technical Workpackage. The development teams will put their work in technical and international context, and they'll outline the developments that are being considered for implementation during Horizon 2020. They'll also involve you in their planning, so prepare to enjoy a little bit of audience participation.

GRID & Cloud	If you're not using it already you will be soon. Learn how remote computing is being tamed.
Tools for simulation	The VPH NoE ToolKit contains many riches. Learn about the Toolkit, the new VPH Portal and the details of the new web-friendly cardiovascular suite.
Image processing	Image processing workflows have recently made huge progress, thanks to interoperability. Learn from the teams who write the code.
Molecular simulation	Taming a complex challenge using innovative techniques and specialised computation: See a successful demonstration of the VPH at its best.
Markup Languages	Standardisation makes everything easier. Lean how standardised language representation has altered the face of the VPH.
Semantics	The world of annotated entities promises a lot, and is now delivering on the promise. Learn, or fall behind…
Data	We all need data, but it's not easy to get it. Learn how the VPH is building infrastructure to make it easy.

....

Venue: UCL, London. Registration: http://noe-toolkit.eventbrite.co.uk/

Index of abstracts (by session)

Malandrino A *et al:* Mechanical Effect on Cell Viability in Healthy and Degenerated Intervertebral Discs. Abstract 50

Dumas R *et al:* Simultaneous prediction of musculo-tendon, joint contact, ligament, and bone forces in the lower limb during gait. Abstract 14

Ruiz C *et al:* Mesh convergence is affected by poroelasticity in multi-tissue intervertebral disc models. Abstract 52

Neurological applications – Siemens Room 11:35

Lötjönen J *et al:* PredictAD – From Patient Data to Personalised Healthcare in Alzheimer's Disease. Abstract 113

Lötjönen J *et al:* PredictAD – From Patient Data to Personalised Healthcare in Alzheimer's Disease. Abstract 113

Boccia E *et al:* Wave transmission in a three-dimensional nonhomogeneous viscoelastic brain model. Abstract 48

Orlowski P *et al:* Modelling of the Physiological Response of the Brain to Stroke. Abstract 108

Multiscale modelling applications – Thompson Room 11:35

Carlier A *et al:* A multiscale model of sprouting angiogenesis during fracture healing. Abstract 28

Liu H *et al:* Multi-scale biomechanical modeling and energy loss evaluation of aortic aneurysm. Abstract 103

Wright D *et al:* Multiscale Modelling of the Interplay Between Global and Local Structural Changes in Viral Drug Target Proteins. Abstract 126

Stachowska-Pietka J *et al:* A spatially distributed approach of intraperitoneal fluid kinetics combined with its transport through the interstitium during peritoneal dialysis. Abstract 118

Benson A P *et al:* A validated and optimised model linking muscle and pulmonary oxygen uptake kinetics. Abstract 102

Multiscale applications – Mountbatten Room 11:35

Moss R *et al:* A multi-nephron model of whole-kidney function for simulation of renal pathologies and blood pressure regulation. Abstract 58

Manini S *et al:* Validation of patient specific multi-scale hemodynamic computational model for planning vascular access surgery in hemodialysis patients. Abstract 33

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Multiscale techniques and applications – Lecture Theatre 14:50

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Medvedev A *et al:* Discrete-continuous Mathematical Modeling of Endocrine Systems with Pulsatile Secretion. Abstract 107

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Evison F *et al:* A case study demonstrating VPH-NoE guideline compliance: Exercising the toolkit guidelines for a simple graphical tool. Abstract 51

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Gomez-Cabrero D *et al:* Neuroswarm: a methodology to explore the constraints that function imposes on simulation parameters in large-scale networks of biological neurons. Abstract 92

Data fusion – Mountbatten Room 16:20

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Bleuze B *et al:* A Horizontal Data Fusion Toolbox: Putting the focus on interoperability. Abstract 129

Martelli Y *et al:* A software framework for reconstructing the proximal femur from dual-energy x-ray absorptiometry and assessing the risk of fracture. Abstract 41

Samei G *et al:* Advantage of a Patient-Specific Respiratory Motion Model for the Liver. Abstract 114

Sessional Workshops

Cardiovascular applications and medical device design and assessment (MeDDiCA) – Council Chamber 10:00

Soleimani S *et al:* Effects of applied pressure and clot viscosity on aspiration catheter performance. Abstract 8

Bozkurt S *et al:* Improving the Pulsatility in a CF-LVAD Supported Cardiovascular System Applying a Model Control to CF-LVAD Flow Rate. Abstract 1

Cosentino D *et al:* Risk stratification for stent fracture prediction in percutaneous pulmonary valve implantation through patient-specific finite element analysis. Abstract 80

Nallamothu R K *et al:* A Multi-physics model of the Ventricular valve-valve interaction. Abstract 30

Li Y *et al:* Experimental and numerical simulation study of the near-hinge flow field of a bileaflet mechanical heart valve. Abstract 83

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Shim E B *et al:* Patient-Specific Identification of Optimal Placement of Ubiquitous ECG using a 3D Heart Model. Abstract 132

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Wang G *et al:* Analysis of local and global Hemolysis Index in 2D velocity field of regurgitant flow in mechanical heart valve. Abstract 82

Amatruda C *et al:* Contribution of mechanical and fluid response to in-stent restenosis. Abstract 40

Decorato I *et al:* Simulation of the fluid-structure interactions after balloon-angioplasty and stenting treatment in a stenosed arteriovenous fistula geometry. Abstract 6

Tahir H *et al:* Modelling the influence of re-endothelialization on in-stent restenosis. Abstract 85

Zwierzak I *et al:* Three dimensional optical reconstruction method for stent geometry characterisation; data validation using micro CT technique. Abstract 10

Spranger K *et al:* Comparison of computational methods for simulating stent deployment. Abstract 94

Modelling for patient safety – Siemens Room 14:50

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Dordoni E *et al:* Fatigue behaviour of Nitinol peripheral stent: finite element analyses of in vivo loading conditions. Abstract 60

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Day 2 – Wednesday, 19 September

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