

REVAMMAD Workshop One, 25 Nov - 6 Dec, University of Lincoln, DRAFT programme

Module 1: Introduction to REVAMMAD (6 ECTS). This introductory module provides grounding in the key clinical and biomedical aspects of the project, and some fundamental transferrable skills.

Learning activities consist of preparatory reading, a two week intensive workshop and follow-up studies. The programme of events is:

1. Clinical background (day 1-2). Physiology of the vasculature and retina, diseases, societal issues, interventions, diagnostics, health sector policy.
2. Basic vascular modelling (day 3-5). Computational flow dynamics, particle models, mechanical properties, microvascular structure and rheology.
3. Basic retinal imaging (day 6-8). Imaging technologies, segmentation algorithms, filtering, noise, resolution limitations, extracting measurements, reference standards, registration.
4. Research skills (day 9). Ethics, remote collaboration and e-tools, time management and PDP.
5. Brainstorm/team-building activity (day 10). Collaborative activity to generate initial ideas to address key research problems (identified by academic team), including presentation to and critique by whole ESR group.

Major learning outcomes (LOs):

- 1.1. Comprehend the mechanical and physiological vasculature attributes including the microcirculation [K];
- 1.2. Knowledge of the structure and function of the retina [K];
- 1.3. Understand major vascular diseases, including their social and economic impacts, mode of action and implications for vascular structure [K];
- 1.4. Understand key concepts and limitations in fluid modelling methods: computational flow dynamics and particle models [S];
- 1.5. Overview of retinal segmentation, including major families of algorithms, effect of noise and distractors, limitations including on measurement accuracy and completeness of segmentation [S]
- 1.6. Knowledge of fundamental research and collaboration methods [S];
- 1.7. Identify key ethical issues and demonstrate knowledge of ethical procedures [S].

Workshop Programme, Week One:

Monday 25 Nov (Day 1 – The retinal vascular system)	
9:00	Introduction to Workshop Professor Andrew Hunter and Clare Desplats An overview of REVAMMAD, and the key research challenges. The programme structure, responsibilities and roles of ESRs.
9:30	Session 1 [The retinal vascular system, anatomy] Toke Bek, Aarhus University Hospital
10:30	Coffee
11:00	Session 2 Introduction by ESRs Each Researcher will be invited to give a five minute presentation on themselves, their background, and their initial ideas for their research direction, to be followed by time for one to two questions.
12:30	Lunch
13:30	Session 3 [The retinal vascular system, physiology] Toke Bek, Aarhus University Hospital
15:00	Coffee
15:30	Session 4 [The retinal vascular system, methods of study] Toke Bek, Aarhus University Hospital
17:00	Close

Tuesday 26 Nov (Day 2 – Retinal vascular disease)	
9:00	Session 1 [Diabetic retinopathy] Toke Bek, Aarhus University Hospital
10:30	Coffee
11:00	Session 2 [Arterial hypertension] Maged Habib, Sunderland Eye Infirmary
12:30	Lunch
13:30	Session 3 [Age-Related Macular Degeneration] Maged Habib, Sunderland Eye Infirmary
15:00	Coffee
15:30	Session 4 [Primary open-angle glaucoma] Maged Habib, Sunderland Eye Infirmary
17:00	Close

Wednesday 27 Nov (Day 3 – Screening)	
9:00	Session 1 [Diabetic Retinopathy Screening] Greg Russell, Health Intelligence Ltd
10:30	Coffee
11:00	Session 2 [Hypertension, potential screening] Giota Anyfanti, Hippokration General Hospital
12:30	Lunch
13:30	Team Building Event

Thursday 28 Nov (Day 4 – Vascular Modelling: Networks and Haemodynamics)	
9:00	Session 1 [Microvascular networks: Topology, angioarchitecture and nomenclature] Axel Pries, Charite
10:30	Coffee
11:00	Session 2 [Microrheology and Hemodynamics] Axel Pries, Charite
12:30	Lunch
13:30	Session 3 [Blood flow models and boundary conditions] Jean-Frederic Gerbeau, INRIA
15:00	Coffee
15:30	Session 4 [Fluid mechanics and fluid-structure interaction] Jean-Frederic Gerbeau, INRIA
17:00	Close

Friday 29 Nov (Day 5 – Vascular Modelling: Vascular Adaptation)	
9:00	Session 1 [Concepts of vascular adaptation and adaptive signals] Axel Pries, Charite
10:30	Coffee
11:00	Session 2 [Computer modelling of vascular adaptation] Jens Brings Jacobsen, University of Copenhagen;
12:30	Lunch
13:30	Session 3 [Long term adaptation in vascular disease (Hypertension JBJ, Tumor ARP)] Jens Brings Jacobsen, University of Copenhagen; Axel Pries, Charite
15:00	Coffee
15:30	Session 4 [Short term dynamics and arteriolar vasomotion] Jens Brings Jacobsen, University of Copenhagen
17:00	Close

Workshop Programme, Week Two

Monday 2 Dec (Day 6 – Retinal Imaging)	
9:00	Session 1 [Introduction to Retinal Imaging] Manuel Trucco, Dundee University
10:30	Coffee
11:00	Session 2 [Locating Vessels] Bashir Al-Diri, University of Lincoln
12:30	Lunch
13:30	Session 3 [Public Engagement – Promoting Science to the General Public] David Sleight, Dean of Public Engagement, University of Lincoln
15:00	Coffee
15:30	Session 4 [Engaging with the Media] Marie Daniels, College of Science PR Officer, University of Lincoln
17:00	Close

Tuesday 3 Dec (Day 7 – Retinal Imaging)	
9:00	Session 1 [Locating Vessels 2, Estimating Width] Bashir Al-Diri, University of Lincoln
10:30	Coffee
11:00	Session 2 [Tortuosity, AV, AVR] Alfredo Ruggeri, University of Padova
12:30	Lunch
13:30	Session 3 [Image Mosaicing, Developing Interfaces] Alfredo Ruggeri, University of Padova; Xenophon Zabulis, FORTH
15:00	Coffee
15:30	Session 4 [Workshop Session] Bashir Al-Diri, University of Lincoln; Alfredo Ruggeri, University of Padova
17:00	Close

Wednesday 4 Dec (Day 8 – Retinal Imaging)	
9:00	Session 1 [Clinical aspects of Retinal Image Analysis] Xenophon Zabulis, FORTH
10:30	Coffee
11:00	Session 2 [Validation] Manuel Trucco, University of Dundee
12:30	Lunch
13:30	Session 3 [Invited industrial talk: OPTOS Ltd] Alan Fleming/Jano van Hemert, OPTOS Ltd
15:00	Coffee
15:30	Team Building Event
17:00	Close

Thursday 5 Dec (Day 9 – Research Skills)	
9:00	Session 1 [Collaboration and e-Tools] Joss Winn, University of Lincoln
10:30	Coffee
11:00	Session 2 [Personal Development] Kelly Sisson, RTD Training Coordinator, University of Lincoln
12:30	Lunch
13:30	Session 3 [Data Warehousing] Luca Antiga, Orobix (?TBC); Joss Winn, University of Lincoln
15:00	Coffee
15:30	Session 4 [Introduction to Intellectual Property Rights] James Murray, University of Lincoln
17:00	Close

Friday 6 Dec (Day 10 – Research event)	
9:00	Session 1 [Plenary – identifying key REVAMMAD research themes, questions, approaches] Facilitators: Andrew Hunter and Bashir Al Dir, University of Lincoln To include an introduction from the Coordinator and brief presentations of ideas from each ESR
10:30	Coffee
11:00	Session 2 [Breakout – brainstorming and planning] Facilitators: Andrew Hunter and Bashir Al Dir, University of Lincoln
12:30	Lunch
13:30	Session 3 [Presentation of group ideas, and discussion] Early Stage Researchers, All Partners!
15:00	Closing remarks and coffee