

15HLT05 Kick-Off Meeting

2016-07-20

St. Thomas' Hospital, London

Participants:

Tobias Schaeffter, Björn Brinkmann, Gerd Wübbeler, Stephan Rosendahl, Ludwig Büermann, (PTB)
Nicolas Fischer, Loïc Coquelin (LNE)
Trevor Esward, Peter Harris, Andrew Fenwick, Nadia Smith (NPL)
Gertjan Kok (VSL)
Antti Kosunen, Teemu Siiskonen (STUK)
Mika Kortensniemi (HUS, UH)
Amedeo Chiribiri, Pritesh Mistry, Jim o'Doherty (KCL)
Mika Teräs, Jarmo Teuvo, Janne Saarinen (TUCH)
Christian Poelma (TUD)
Myles Capstick, Niels Kuster (ZMT)

Excused: Laura Weiss (KCL)

Meeting Minutes

Round-Table: Project members introduced themselves and indicated their area of work.

State of recruitment: No delays are expected due to recruiting, partners either have recruitment well under way (KCL, PTB, TUCH) or have a resident pool of scientists covering the recruiting period (HUS, VSL, LNE, NPL, TUD).

Aims: An overview of the top level aim and the corresponding objectives has been given. The project is organised into four work packages (three scientific + one impact). Work-package leaders were introduced (WP1 Amedeo Chiribiri, WP2 Trevor Esward, WP3 Ludwig Bueermann, WP4 Mika Teräs).

Synchronisation: The importance of continuous reporting has been emphasised, i.e. each activity requires early reporting, activity updates and communication of any changes.

Project planning: Project management will focus on activities for the next 6-9 months. Intermediate meetings will be performed for the different WPs and organised by the WP leaders. Action points will be defined and checked in 3 month intervals. The Overview of relevant activities and related actions can be found: <https://ocloud.ptb.de/index.php/s/CY2QqbXTd9o0g8l>

Web-page: A web-page will be created for external marketing.

Document Cloud Archive: A web-based cloud has been created as an internal document archive (meeting minutes, presentations, contract, publications etc.) The cloud is password-protected and read-only. <https://ocloud.ptb.de/index.php/s/d9cCYcx0h1PS4tp> (passwd: "p3rfus10n")

Background /State-of-the-Art

Amedeo gave a presentation on the importance of perfusion imaging and the need for a physical standard and the need for standardised data analysis tools informing a clinical perspective.

<https://ocloud.ptb.de/index.php/s/emiMBf6t3r6zr4L>

A lab demonstration of the current perfusion phantom was performed.

Work packages:

WP1 Physical Standards & Imaging - KCL

From a clinical perspective the work on the physiological flow pump (A1.1.1) should be reconsidered. A paper study will be performed to study the effort (what would it take, how long would it take, comparison of available flow pumps) and the impact of physiological flow profiles on the project. It seems that current temporal resolution of perfusion imaging is quite low. A response with a cost/benefit analysis should be given early, which might be negative.

From a clinical perspective the spatially varying flow is of high importance and work should focus on this aspect. The effort on building and using reference measurements were discussed resulting in different actions (see below).

The development of the physical standard was summarised in a presentation from Myles (ZMT): <https://ocloud.ptb.de/index.php/s/9bgI9zWBi0uvAFT>

The early availability of imaging data is crucial for WP2. Actions for distributing MR and PET data (phantom and patients) were defined for KCL and TUCH (see below). Dicom viewers to quickly check imaging data and routines (matlab) for importing data for scientific computing were discussed.

Example DICOM viewers are OsiriX, XnView, 3DSlicer, MicroDicom

(<http://www.microdicom.com/downloads.html>) etc., some of which can be downloaded as public domain tools.

Actions:

Physical Standard:

- **AP Myles:** Sending presentation to Björn until **22-Jul-2016**
- **AP Myles:** Sending info on potential materials used in 3D printing to Christian (TUD) until **25-Jul-2016**
- **AP Myles:** Performing initial simulation for spatially varying flow compartment until **5-Sep-2016**
- **AP Myles:** Sending geometry files for detailed CFD simulation to Gertjan (VSL) until **5-Sep-2016**
- **AP Myles:** Performing 3D printing of spatially varying flow compartment until **26-Sep-2016**
- **AP Christian:** Sending information of appropriate flow/pressure sensors and flow pumps (for the flow presented flow regime) to Myles until **25-July-2016**
- **AP Christian** Initial experiments of flow measurements on “Plexiglas” cylinder (empty +straws) **5-Sep-2016**
- **AP Gertjan:** Simulation requirements of spatially varying flow section **5-Sep-2016**
- **AP Amedeo:** Necessity of right myocardium in the phantom, i.e. a single (left) myocardium **26-Sep-2016**
- **AP Myles, Amedeo, Christian:** Assessment of physiological flow design, i.e. overview of required modification (pump, hoses, location of pump to ensure profile at location of myocardial compartment). Analysis of cost/benefit **12-Sep-2016**

Imaging:

- **AP Amedeo** Provision of two MR-perfusion datasets (patient data, phantom data) on perfusion together with description of files and screenshots of expected perfusion curves **8-Aug-2016**
- **AP Mika T** Provision of Clinical PET perfusion data of 50 anonymised patients with clinical reports on FTP link **22-Aug-2016**
- **AP Amedeo** Provision of Clinical MR perfusion data of 50 anonymised patients with clinical reports on FTP link **29-Aug-2016**

ALL WP1-members Web-Meeting 14-Sep-2016

WP2: Data Analysis and Uncertainty Analysis – NPL

Trevor gave a presentation on the aims of WP2. The distribution of work and dependencies were clarified. In particular, the importance of early access to data was stressed (see actions WP1). Two additional presentations on „ Metrology perspective on deconvolution“ (Nadia Smith) and „Bayesian Methods“ (Gerd Wübbeler) were given. All presentations can be found at:

<https://ocloud.ptb.de/index.php/s/dwL45CgsrwRV4qt>

The activities of the next 6 months were discussed in detail. In particular, a state of the art-report (A2.1.3) should summarise work in this area and open issues with respect to metrology. The publication of a review article (e.g. in a metrology journal) should be considered. A set of publications is available at:

<https://ocloud.ptb.de/index.php/s/0kWODPbyuajm1oX>

Detailed planning of the state-of-art report is necessary (AP Trevor). The following actions have been defined:

Actions:

- **AP Tobias** Establishing directory for publications on perfusion on cloud with writing rights
- **AP Gerd** Liaising with Christoph Kolbitsch (PTB) on DICOM/MATLAB interface function **8-Aug-2016**
- **AP Nadia, Loïc, Gerd** Test of Public domain dicom viewer **8-Aug-2016**
- **AP Mika T** Define activity on PET Perfusion data analysis in Turku to justify current postdoc position and send plan to Björn until **15-Aug-2016**
- **AP Nadia, Loïc, Gerd** Feedback on assessing/viewing perfusion patient and phantom data into matlab until **29-Aug-2016**
- **AP Trevor** Organise work distribution for state-of-art report among WP2 partners, (e.g. Telephone conference etc.) and send outline around until **29-Aug-2016**
- **AP Andrew** Link activity on radioactivity measurements with clinical sites (KCL and TUCH). In particular TUCH is interested in activity measurement for potentially improving quality of AIF in cases of short half-life nuclei O15. Andrew needs to discuss this offline with Mika T. Define project plan **until 5-Sep-2016**
- **AP Trevor** Define relevant uncertainty with all partners **ongoing**

ALL WP2-members Web-Meeting 8- Sep- 2016

WP3: Personalised Dosimetry –PTB

An overview of former work and present work was given by Ludwig (<https://ocloud.ptb.de/index.php/s/Q4uR8gnYp5nMPx4>). In particular different designs of mobile devices were presented and discussed. The distribution of experimental and simulation work was discussed. This resulted in the following Actions:

Actions:

- **AP Ludwig** PTB will design equivalent source models at its CT facility using new mobile equipment **until 29-Sep-16**
- **AP Ludwig** PTB will measure and calculate dose profiles free-in- air and in standard CTDI phantoms at the same CT facility **Nov-2016**
- **AP Ludwig** PTB will choose method for quick measurement of X-ray spectra by **Nov-2016**
- **AP Ludwig** PTB will distribute the data **Dec 2016**
- **AP Ludwig** PTB will perform simulations using the general purpose MC programme EGSnrc. Uncertainties of both measured and calculated data are aimed to be less than 3 %. **Dec-2016**
- **AP Antti/Mika K STUK/HUS** will simulate these measurements with the Monte Carlo code “ImpactMC” or otherwise use (?) the equivalent source model determined by PTB. **Dec-2016?**

WP4: Creating Impact-TUCH

Different pathways of creating impact were discussed. The importance of publications was stressed. For this a list of targeted conferences and journals should be created. At least 9 journal papers and 9 conference publications are expected over the course of the project.

Furthermore, a list of stakeholders should be created. A subset of the stakeholders will form an advisory board. The role of webinars for training was discussed. This allows including high-profile speaker as external speakers (pot. Candidate would be Marc Dewey (Charité) or Michael Jerosch-Herold (Harvard)).

Actions:

- **AP Tobias:** Establishing project document archive on a cloud (password protected) **22-Jul-2106** <https://ocloud.ptb.de/index.php/s/d9cCYcx0h1PS4tp> (passwd: “p3rfus10n”)
- **AP Björn:** Set-up project calendar (web-meetings, f2f meetings, webinars) **15-Aug-2016**
- **AP Björn:** Set-up project members list (excel sheet: names, email, affiliation, telephone, WP affiliation) **15-Aug-2016**
- **AP Björn:** Provide an overview of targeted conferences & publications with deadlines with input from WP leaders **15-Aug-2016**
- **AP Björn:** Create a list of stakeholders with input from all project members **29-Aug-2016**
- **AP Björn:** Create & manage project website with links to relevant information (stakeholders, databases etc.) **29-Aug-2016**
- **AP Amedeo** Define date (in December) and programme of first Webinar (physiology, perfusion, A4.2.1) **5-Sep-2016**
- **AP Mika T** Define date (in January) and programme of 2nd Webinar (imaging, A4.2.2) **5-Sep-2016**
- **AP Trevor** Define date (in Mar-April) and programme of data analysis Workshop (consider external speakers) **5-Sep-2016**

Next meetings:

- September 8th : Web Meeting WP2
- September 14th: Web Meeting WP 1
- 2nd week of March: Next physical meeting, likely in Delft, Monday March 6th 2017