PCMM Biobank, IT-infrastructure and decision support

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Disease area: Oncology

Introduction

In Western countries, prostate cancer is the most frequent malignancy and one of the major causes of cancer-related death in men. The **Prostate Cancer Molecular Medicine** (PCMM) project addresses two major clinical needs in prostate cancer, namely the **reduction of overdiagnosis and overtreatment** of this disease due to screening and the **improvement of therapy monitoring** of advanced disease. While work packages 1 and 2 are related to the discovery of biomarkers and the development of novel imaging approaches, work package 3 (**WP3**) is about biobanking, the IT infrastructure and decision support.

PCMM biobank

The four PCMM clinical centers are jointly establishing a **prospective biobank** containing blood, urine, tissue clinical- and imaging-data from the following patient groups:
1) 200 men who chose to undergo a prostate biopsy on the indication of higher risk through the Prostate Risk Calculator (www.preventiekompas.nl)
2) 200 men with localized prostate cancer who undergo primary treatment by radical prostatectomy
3) 55 men with metastatic hormone-refractory prostate cancer who participate in a Phase I trial with therapy response monitoring by molecular imaging in WP2

The PCMM biobank will be part of the Dutch String of Pearls (**Parelsnoer**) initiative.

At this moment(summer 2011), data from more than 40 patients of patient group 2 have been collected. This includes >27000 MRI images and ~200 US images, as well as clinical data (lab values, questionnaires) and blood/urine/tissue data.
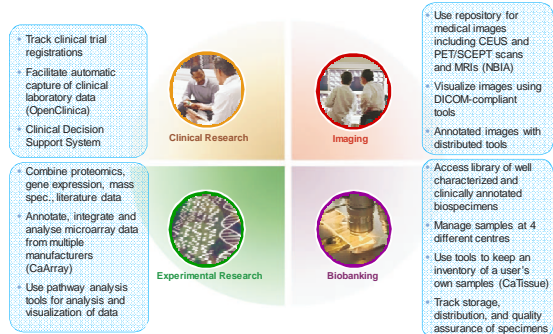
Decision Support System (DSS)

PCMM is developing an IT infrastructure to allow for the inclusion of results from novel biomarker tests and imaging tools into a DSS for prostate cancer. Such a system will assist physicians in the selection of the **best individual treatment strategy** for their patients diagnosed with prostate cancer. As a part of this system, several open source applications have already been installed and are operational, such as the OpenClinica software package and various CaBIG (Cancer Biomedical Informatics Grid) applications e.g. NBIA, CaArray, CaTissue, CaIntegrator for storing and analyzing clinical and biological data. These applications are web-accessible to the authorised participants of WP3.

Data collection

MRI — Clinical — US — Urine — Blood — Tissue
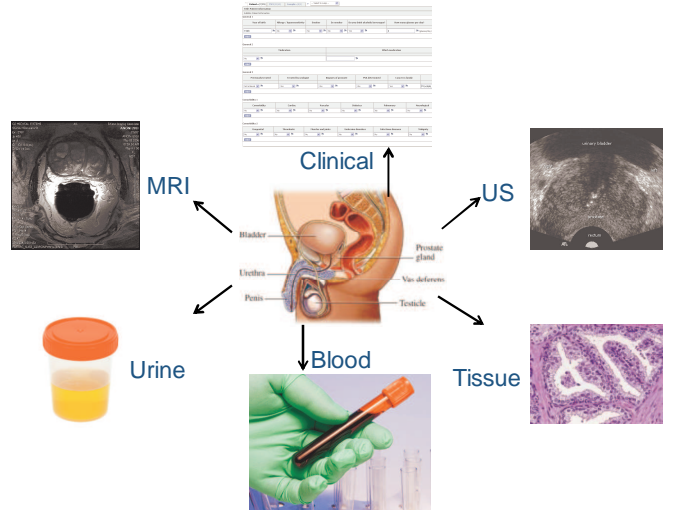
Translational Research IT infrastructure

The IT infrastucture that is being set up for PCMM will also be part of the new CTMM project TraIT (Translational IT Infrastructure). The current PCMM infrastructure includes OpenClinica, NBIA and CaTissue and will be extended to include CaArray, CaIntegrator and other programs in cooperation with TRAIT.

Clinical Research
- Track clinical trial registrations
- Facilitate automatic capture of clinical laboratory data (OpenClinica)
- Clinical Decision Support System

Imaging
- Use repository for medical images including CEUS and PET/SCEPT scans and MRIs (NBIA)
- Visualize images using DICOM-compliant tools
- Annotated images with distributed tools

Experimental Research
- Combine proteomics, gene expression, mass spec., literature data
- Annotate, integrate and analyse microarray data from multiple manufacturers (CaArray)
- Use pathway analysis tools for analysis and visualization of data

Biobanking
- Access library of well characterized and clinically annotated biospecimens
- Manage samples at 4 different centres
- Use tools to keep an inventory of a user's own samples (CaTissue)
- Track storage, distribution, and quality assurance of specimens

Participants

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