





JOINT TRANSNATIONAL CALL 2016:

"Minimally and non-invasive methods for early detection and/or progression of cancer"

PARTNER REQUEST/COLLABORATION OFFER

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***I agree with the publication of my contact data and of this form on the TRANSCAN-2 Website:**

YES



SEARCH FOR A COLLABORATOR

IF YOU ARE LOOKING FOR A PARTNER IN YOUR SUGGESTED PROPOSAL, PLEASE SPECIFY ALSO THE NEEDED EXPERTISE

Project proposal

Project title (draft):

Short description of the project in preparation and of the consortium; description of the areas of expertise needed (Max. 2000 words):



OFFER FOR COLLABORATION

IF YOU PROPOSE YOURSELF AS A PARTNER IN A CONSORTIUM, PLEASE DETAIL YOUR EXPERTISE

Short description of the areas of interest and expertise (Max. 2000 words):

The Imaging and Data Processing (IDP)-Lab, located in the Imaging Unit of “Candiolo Cancer Institute” and headed by prof. Regge, is composed by a multidisciplinary, multi-investigator team, involving researcher from different fields: medical imaging, computer science, and radiology. During the last 10 years, the IDP-Lab acquired strong expertise in medical imaging and oncology field, implementing algorithms for the detection of tumours, in particular to enhance diagnosis of cancer using computer aided detection (CAD) systems (i.e. CAD colon, CAD breast, CAD prostate), and developing imaging biomarkers to assess cancer aggressiveness.

Recently, the group has actively pursued research in the field of multiparametric (mp) magnetic resonance (MR) imaging of the prostate. In particular, from a dataset composed of 175 consecutive patients who underwent mp-MR examination and radical prostatectomy, the group developed a CAD system for prostate cancer (PCa), based on the combination of morphological and functional parameters extracted from different mp-MR sequences, and histologic results from surgery. The CAD system provides a probability map of cancer suspicious areas, thus improving the diagnostic accuracy of the radiologist, reducing reader variability, and speeding up the reading time during the reporting process. Preliminary results showed a sensitivity of 94%, with a median number of false positives per patient equal to 1, and 2 in the peripheral and central zone, respectively. Further research is ongoing to develop a clinical decision support system based on MR imaging to stratify patients according to PCa aggressiveness, using pathological assessment after prostatectomy as reference standard. Preliminary observations from our imaging laboratory have already proven that texture analysis applied to T2-weighted and diffusion weighted imaging is related to cancer aggressiveness.

In addition, we have developed a technique to perform MR-guided biopsy in patients with clinically significant PCa at mp-MR imaging. From November 2014 to December 2016, the Imaging Unit in “Candiolo Cancer Institute” was the coordinator center of a prospective randomized clinical study in which about 450 men with PSA ≥ 4 and age ≤ 80 years were considered for inclusion. All of them underwent mp-MRI as a triage exam to select those eligible for either MR-targeted or transrectal-ultrasound prostate biopsy. This trial will allow us to establish if the MR-based diagnostic pipeline is more accurate than the traditional one, with the advantage to have lower cost and fewer complications. Initial experience on the preliminary cohort of 35 patients with at least one suspicion PCa at mp-MR imaging resulted in 86% accuracy for the MR-targeted arm, showing that MR-guided biopsy is quite accurate in detecting PCa.

The Candiolo Cancer Institute disposes of state-of-the-art technology for high quality mp-MR examinations according to the European Guidelines for prostate studies, and to perform MR-targeted prostate biopsy. Our Research Centre acquired in September 2014 the Optima MR450w 1.5 T MR scanner by General Electric, which includes the GE's FOCUS sequences to provide high-resolution, organ-specific diffusion weighted imaging. Since November 2013 we have gained experience with DynaCAD Prostate Enterprise Software to perform real time image analysis, plan interventional procedures, and accurately guide DynaTrim Prostate Interventional Kit towards suspicious regions for accurate biopsy sampling of the prostate.