

SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

Action number: CA15210 (European Network for Collaboration on Kidney Exchange Programmes)

STSM title: Collaboration on re-optimization policies for Kidney Exchange Programs

STSM start and end date: 06/04/2019 to 13/04/2019

Grantee name: Valeria Romanciuc

PURPOSE OF THE STSM

The visit aimed for me, a Master's student at University of Minho, Portugal, to initiate a collaboration with Péter Biró, who hosted this STSM, and his research group at Cornivus University of Budapest. The main goal of the stay was to discuss strategies and exchange knowledge on international collaboration in Kidney Exchange Programs and re-optimization policies in the context of the same project.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMs

Regarding international policies for KEPs, we discussed the work recently conducted by Péter Biró and his research group in collaboration with Alexandru Popa and Radu Mincu from the University of Bucharest. We analyzed the IP model developed and the results of long-term simulations, as they provide more accurate results for these programs.

The host also described and compared the current practices in Europe, not only on a national level, but also in programs involving multiple countries (e.g. Scandiatransplant). We discussed some of their challenges and possible solutions.

As for re-optimization policies, we analyzed recent publications such as the paper by Bartier et al. (2019) on recourse in Kidney Exchange Programs and compared this model to other approaches, such as [Klimentova et al.: Maximising expectation of the number of transplants in kidney exchange programs. *Computers & Operations Research*. 73, 1–11 (2016)] and [Pedroso, J.P.: Maximizing Expectation on Vertex-Disjoint Cycle Packing. In: *Computational Science and Its Applications – ICCSA 2014*. pp. 32–46 Springer International Publishing (2014)], as well as the current work being carried out by Professor Filipe Alvelos and me at University of Minho.

Finally, we also discussed some future lines of work for the project, which includes improving the compatibility testing system and the quality of the overall solutions. This is also closely related to the current topic of study of Working Group 2.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

We discussed some possible next steps for my work with Professor Filipe Alvelos and how we could apply our model to a multi-center context, like the case of the UK, where different centers perform the compatibility tests. We allow for different prices to be considered for a crossmatch test, which can simulate the differences of carrying out tests at different facilities and the costs inherent to the logistics and coordination of such a program.

On top of this, we also compared our implementations, which provided a different perspective to possibly use in our own simulations, namely conducting long-term simulations.

The discussions and advice obtained also represent a big contribution for the research in the scope of my Master's dissertation, which focuses on probing policies with budget and time constraints in KEPs.

FUTURE COLLABORATIONS (if applicable)

The possibility of collaborating on international KEPs was discussed and will again be considered in June of this year, when Professor Filipe Alvelos and I come back for the ENCKEP Meeting in Budapest.

We were also invited by the host to do a presentation of our work in this conference.