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Short Term Fellowships of the International Society for Forensic Genetics (ISFG)

«A short report about the purpose and main outcome of the exchange visit»

With the help of this fellowship, I had the chance to visit the Department of Genetic Identification in Erasmus University, Rotterdam, The Netherlands for the period 19-24 November 2018.

The purpose of the visit was to work on epigenetics, using next generation sequencing (NGS) technology and more specifically, the Ion Torrent S5 platform. This visit was the first step towards a future collaboration between the two departments, the second being the Laboratory of Forensic Medicine and Toxicology, School of Medicine, Aristotle University of Thessaloniki, Greece. This collaboration will focus on the DNA methylation status of certain markers/gene promoters in heroin addiction. Blood samples have already been collected from chronic heroin users, from which DNA will be extracted and analyzed in the Netherlands where it will undergo bisulfite treatment and next generation sequencing.

During my stay in Erasmus University I had the chance to go through the whole process of NGS from sample pretreatment through to data analysis.

At the beginning of the week I was shown how to prepare a library for eight DNA samples on the Ion Chef Instrument. Each library was quantified using the Ion Library Taqman Quantitation kit on a Biorad CFX 384 real time PCR system and the quantities needed for the library pools were computed. Moreover, I was shown how to manually prepare a library using the TruSeq DNA PCR-Free library preparation kit. The two library pools were then loaded onto two chips using the Ion Chef instrument. The next day the Ion S5 sequencer was initialized and loaded for a run of one chip at a time for a total of two runs. At the end, we carried out a demonstration of sequencing data analysis using the Torrent Suite software.

During my stay, I also had the chance to attend some method development experiments and more specifically PCR optimization techniques. On my third day, I attended a lecture given by Dr. Thomas Parsons, Director of Science and Technology at the ICMP on “Modern approaches on Genetic Identification of Missing Persons” and we had the chance to talk about the refugee situation in Greece. Furthermore, throughout the week I had several collaborative meetings, where topics such as study planning and sampling initialization programming were discussed towards establishing a closer collaboration between the two laboratories.

In view of the above, this was a very fruitful visit and I am confident that it will mark the beginning of a new collaboration.