

Summary Report for Short Term Fellowship Awarded by ISFG

Title of visit: DNA Analysis of Human Skeletal Remains in Forensic Casework

The Department of Forensic Sciences and Criminology in Dubai Police has a long-lasting collaboration with the Institute of Forensic Medicine in Clinical, Centre of Vojvodina in Novi Sad in Serbia since 2015. The results of this collaboration reflected in four researches which have conducted in both laboratories and published [1-4]. Because of differences in the samples received at each laboratory, it is important to enhance our knowledge and experience the rarely seen samples in Dubai Laboratory such as skeletal human remains. Due to the geographical and political history of Serbia, Forensic Medicine in Clinical has received a high number of skeletal remains samples which has been exposed to diverse degradation factors.

During the visit we were able to investigate the process of analyzing DNA from skeletal remains starting with pre-extraction treatment, including detergent cleaning of the bones, all the way to the stage of obtaining full DNA profile and calculating the likelihood ratios. Extraction was done using PrepFiler® BTA Forensic DNA Extraction kit with some modifications in order to maximize the yield and quality of the recovered DNA. These modifications included, the incubation of samples overnight during bone powders lysis step and the addition of 3µL of DTT to the lysis buffer along with the incubation for 45 minutes at 56°C. Although such modification did increase the analysis time of the analysis, however, it did result in high quality full DNA profiles generated using Identifiler® amplification kit. along with capillary electrophoresis analysis on 3500 Genetic Analyzer. Moreover, we went through kinship analysis between resulted profiles of the remains and accompanying reference where we were able to conduct kinship analysis with high level of confidence.

During this visit, we experienced the whole DNA workflow at Institute of Forensic Medicine as well as we were able to visit different facilities such as Forensic Medicine. During this visit we also established a collaboration link with Forensic Medicine Course at the institute which soon will start exchanging opportunities both in education and in practical research area.

By the end of this report, I would like to encourage all members to try exploring forensic laboratories far from their area to maximize their knowledge in forensic DNA analysis and also to enhance collaboration and researches in forensic genetics.

[1] Mutation rate at 13 rapidly mutating Y-STR loci in the population of Serbia, Forensic Science

[2] DNA Analysis from human skeletal remains in forensic casework.

[3] Rapidly mutating Y-STRs population data in the population of Serbia and haplotype probability assessment for forensic purposes.

[4] Genetic characterization of 27 Y-STR loci with the Yfiler® Plus kit in the population of Serbia.