Thank you to the ISFG board members for awarding me with the ISFG Short Term Fellowship 2018.
It made an exchange visit of Dr. Theresa E. Gross, Institute of Legal Medicine, University Hospital Cologne, Germany to the Forensic Genetics Group lead by Prof. Denise Syndercombe Court at King's Forensics, Faculty of Life Science & Medicine, King's College London, United Kingdom possible. The exchange visit took place from 12th – 26th of August 2018.

The purpose was to strengthen collaborative efforts between both universities in regard to population genetic studies and especially for the generation of a reference population database for Kurdish Iraqis using length- as well as sequence-based STR and SNP data. This reference population database is supposed to feed the 'Lost Children of Halabja' project – a collaboration between King's College London, the Sulaimaniyah Medico-Legal Institute and the KRG-Iraq Ministry of Health in the Kurdistan Region Iraq aiming to reunite long separated families. The city of Halabja in the Kurdistan Region in Northern Iraq suffered from a chemical attack in March 1988 in the late stages of the Iran-Iraq-War. These bombings claimed more than 3,000 lives. Another 7,000 - 10,000 Kurdish people were injured and lost track of their children and other family members during the chaotic aftermath of the attack. The Iranian army has rescued some of these long lost children at the time and these now adults have returned to search for their families. The understanding of genetic variation within the Kurdish Iraqi population is a crucial first step to meet the major challenge of family reunions within the 'Lost Children of Halabja' project as rather complex relationships such as half-siblings, first and second degree cousins, uncle-nephew, grandparent-grandchild or similar need to be identified by forensic DNA analysis.

The main outcome of this exchange visit was the DNA library preparation with the ForenSeq™ DNA Signature Prep Kit Mix A (27 autosomal STRS, 24 Y-STRs, 7 X-STRs, 94 autosomal SNPs) and subsequent sequencing of samples from individuals either born in Erbil or Sulaimaniyah, Kurdistan Region Iraq on the MiSeq™ FGx. This Kurdish Iraqi MPS data set will improve the understanding of genetic variability in Middle Eastern populations, which are usually not well represented in online genomic databases such as 1000 Genomes or similar. It also enables concordance analysis with appropriate CE kits and extends previously complied CE-based allele frequencies for the Kurdish Iraqi population (not yet published). Preliminary results of this collaborative effort will be presented at the DNA Evidence to Investigative Insights meeting in Barcelona in October 2018.
The lab experience with the MiSeq™ FGx broadened my hands-on MPS experience significantly as I had previously only worked with the Ion PGM™ or Ion S5™ Systems in Cologne. Furthermore, it was a great opportunity to discuss differences and similarities between the alternate MPS platforms currently available for forensic DNA analysis with various colleagues at King's College with varying MPS experience in regard to instruments and marker types used. These insights into both MPS technologies and workflows will enable a better understanding of the specific challenges and problems to face in ongoing and future MPS collaborations.
Moreover, we had a lot of useful discussions and brainstorming sessions about the current status and difficulties of the analysis part of STR sequencing. This is still a laborious and mostly manual process for the average forensic scientist not trained in bioinformatics as a joint nomenclature within the forensic community is still evolving. Therefore current STR MPS analysis results need to be easily adaptable to future nomenclature.

Overall, it was a fantastic opportunity to get to know another lab environment and being able to discuss difficulties and problems of MPS sample preparation and analysis on a daily basis.

Cologne, Germany, September 2018