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THE WHITE ELEPHANT IN THE FIELD – WHAT MEANS „POPULATION“ IN FORENSIC GENETICS?

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To study genetic variants, a forensic scientist has to leave his laboratory and step into the field in order to collect samples from a group of people. A group of people – this is the easiest answer what a human population is. A more precise definition would be a “group of people of interest”, implying that the researcher has a certain knowledge about the properties of the polymorphic system under study. For example, if the Y chromosome is studied, the scientist would probably avoid the sampling of female persons. Of course, outreach is limited, hence the scientist has to develop a strategy to collect a “group of people of interest which is representative” for the larger population. In the context of forensic DNA typing this could be the whole population or the population from which the suspect comes, the “suspect population”. That in turn implies that the researcher has enough knowledge on the structure of the population, its history, its current composition. Knowing this the scientist could do his collection according to the “subpopulation structure”. However, what if self-perception, political categorization (census) and knowledge-based assignment of a putative proband differs? And another complication lurks just around the corner: to make meaningful inferences genetic traits need to be studied in a random sample, i.e. as far as possible unrelated individuals. How can the scientist sample the unrelated without knowing the relationship structure in the target population, the family systems and the social organization? Assuming this issue is solved, and the scientist has collected random samples in the sub-populations representing the population as a whole, the next problem is naming his population sample, a final irritation. Science-based name systems rarely coincide with population names which are used by law enforcement or other authorities acting in the name of the state. The first and final hurdle is therefore: how to communicate to the audience what a population is. This talk is based on own experiences in the field but owes much to the many colleagues who tirelessly collect and intrepidly name population samples for the YHRD.

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