NEXT GENERATION SEQUENCING OF THE miRnome OF EIGHT FORENSICALLY RELEVANT BIOLOGICAL FLUIDS

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miRNAs are small non-coding RNAs that regulate cellular processes through modulation of proteins at the translational level. They tend to be highly stable as compared to other RNA species due to their small size and protection by protein and/or lipid matrices. Thus, it is likely that miRNAs, when fully evaluated, will make excellent candidates for body fluid identification. microRNA analysis of body fluids has been the subject of some recent interest in the forensic community. In this study, small RNAs were isolated from four individual donations of eight forensically relevant biological fluids (blood, semen, vaginal fluid, menstrual blood, saliva, urine, feces, and sweat) and subjected to next generation sequencing using the Illumina® Hi-Seq platform. Sequencing reads were aligned and annotated against miRbase release 21, resulting in a list of miRs and their relative expression levels for each sample analyzed. Body fluids with high bacterial loads (vaginal fluid, saliva, and feces) yielded relatively low annotated miR counts, likely due to oversaturation of small RNAs from the endogenous bacteria. Both body-fluid specific and potential normalization miRs were identified for further analysis as potential body fluid identification tools for each body fluid.