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## Using high-throughput sequencing of the thanatomicrobiome of criminal cases

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The study of the postmortem microbial transformations after human death has yet to be fully investigated. In the present study, a new term, 'thanatomicrobiome', which refers to the microbiome existing in the internal organs and blood of a human host after death, is introduced. The objectives of this study were to (i) establish the best method for extracting and sampling DNA from four internal organs (liver, spleen, heart, and brain) and blood of cadavers with PMIs 20-240 hours using the Roche 454 platform; (ii) demonstrate that the method is feasible to survey the 16S rRNA genes of the microbiome using the IlluminaMiSeq platform; and (iii) compare the beta diversity of the microbiomes by cause of death and gender. The results of the first objective demonstrated that the conventional phenol/chloroform method, followed by bead-beating and ethanol precipitation, was superior for extracting thanatomicrobiome DNA from the four organ tissues and blood of cadavers. The results of the second objective showed that the thanatomicrobiome is similar among the organ tissues and blood sample of the same cadaver. Additionally, facultative anaerobic bacteria, such as *Lactobacillus*, predominate in organ tissues and blood samples of cadavers with short PMIs and obligate anaerobic bacteria such as *Clostridium*, predominate in cadavers with longer PMIs. The third objective demonstrated that there are observable trends among taxa of same gender and cause of death. To date, this is the first study of its kind to examine the microorganisms associated with internal organ tissues of cadavers using culture-independent methods.

### Biography

Gulnaz T Javan graduated with a PhD in Forensic Science from Istanbul University, Istanbul, Turkey in 2003. Her current projects employ next generation sequencing and flow cytometry, of cadaver tissues, microbial diversity in soil under decomposing cadavers, and entomology, to determine corpses' PMIs. She received a \$200,000 NSF grant for the project, "Life after Death - The Thanatomicrobiome." She introduced a new term, Thanatomicrobiome, at the 66<sup>th</sup> Annual American Academy Forensic Science Meeting (AAFS) in 2014.

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