

I87 Cadaver Microbial Signatures of the Submandibular Glands and Thyroid for Forensic Investigations

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Learning Objective: After attending this presentation, attendees will be informed about postmortem microorganisms associated with the submandibular glands and thyroid for use in forensic casework for microbial fingerprinting.

Impact Statement: This presentation will impact the forensic science community by providing information on the role of the submandibular glands and thyroid on their potential use as biomarkers for postmortem interval determination.

The study of the thyroid is an emerging topic, particularly in postmortem microbiome studies, due to the organ's ability to affect the endocrine system. Also, the submandibular gland is a promising, emerging gland of study due to its position relative to the oral cavity. Previous thanatomicrobiome studies have demonstrated that bacteria belonging to the phyla Firmicutes, Proteobacteria, Bacteroides, and Pseudomonadota predominate internal organs and have been considered an important biomarker for postmortem interval. Further, Clostridium species that dominate in internal organs are linked to the hypoxic change that occurs after death, which leads to the switch of bacteria to become obligate anaerobes. Therefore, obligate anaerobes dominate the body after death due to their ability to thrive off fermentation products. 16S rRNA gene sequencing has been critical in thanatomicrobiome studies, which refers to the human microbiome (microorganisms within the body) after death. Currently, it has not been elucidated regarding the microorganisms that are associated with the decay of submandibular and thyroid glands.

We hypothesized that through sequencing of the 16S rRNA gene of the submandibular and thyroid glands, the presence of Firmicutes and Proteobacteria will indicate potential biomarkers for postmortem interval. The present study revealed the postmortem microbial signatures of the submandibular and thyroid glands using the 16S rRNA gene, specifically the V3-V4 hypervariable regions, using universal primers 341F and 805R. We investigated a total of 37 cadavers obtained from ongoing criminal casework, 17 submandibular samples and 20 thyroid samples, and found that there is a correlation between microbial abundance in these postmortem glands. The predominating phyla of interest found in both glands were Firmicutes and Proteobacteria. The predominating genera were *Paenibacillus* and *Streptococcus* in both glands, respectively. Further experimentation of the submandibular and thyroid glands will help to link oral thanatomicrobiome communities to "microbial clock" determinations, thus enhancing postmortem interval estimation.

Cadaver; Microbial Signatures; Forensic Investigation