petsie⁻

Clinical Study

THE SCIENCE BEHIND PETSIE

petsie⁻

Introduction

Oral health is crucial to a **dog's overall well-being**, directly impacting their quality of life. Untreated periodontal disease not only affects the oral cavity but can also lead to **severe complications in vital organs** such as the heart, liver, and kidneys.

Addressing this, the clinical study aims to rigorously evaluate the effectiveness of Petsie—an innovative solution designed to **enhance daily dental care in dogs.**

petsie⁻

Purpose of the Study

This report details the results of an in-depth study conducted by the **Institute of Molecular Genetics and Genetic Engineering at the University of Belgrade** in collaboration with **Novogene Sequencing Center, Cambridge, UK,** on behalf of Petsie.

Using sophisticated metagenomic sequencing techniques, the study assesses how Petsie influences the oral microbiota of dogs. Specifically, the study focused on *measuring changes in the microbial balance and quantifying the reduction of pathogenic bacteria* associated with common dental diseases in canines.

The outcomes of this study provide **compelling evidence of the improvements** in the canine oral environment, driven by the electrolytic technology utilized by Petsie.

These results underscore the potential of Petsie to revolutionize dental care in dogs by effectively mitigating the risks associated with dental diseases.

petsie⁻

Methodology

Sample Collection and Timeline

The study was conducted from July 1, 2023,
to September 15, 2023.

During this time, oral samples were systematically collected
from a cohort of dogs at three critical time points:

1. **Before the introduction of Petsie** (pretreatment)
2. **Midway through the study period** (treatment)
3. **After the study** (posttreatment)

These samples were essential for assessing the baseline
conditions, immediate effects, and longer-term impacts
of using Petsie.

petsie⁻

Metagenomic Sequencing Techniques

Metagenomic sequencing was performed to **comprehensively analyze the bacterial composition** within the canine oral samples.

This process was facilitated using the NovaSeq platform, focusing on the V3–V4 16S rRNA hypervariable regions which provide a **detailed view of bacterial diversity.**

Data analysis was carried out using the qiime2 software package, version 2023.2, which is designed for such bioinformatics applications. The sequences were further classified using the SILVA database, version 138, ensuring high accuracy in identifying microbial taxa at the genus level.

petsie⁻

Testing Phases

The study employed a single cohort of dogs, which was observed across three distinct phases to assess the impact of the Petsie toothbrush over time:

🐾 **Pretreatment** (K): Samples were taken before the introduction of Petsie to establish a baseline of oral microbiota.

🐾 **Treatment** (T): Samples were collected after Petsie had been introduced and used for a certain period. This phase evaluated the immediate impact of the toothbrush on the dogs' oral microbiota.

🐾 **Posttreatment** (P): The final samples were taken after the completion of the treatment period to assess the long-term effects of the Petsie toothbrush on the oral microbiota, particularly looking at microbial balance and the presence of bacteria associated with dental diseases.

The study involved analyzing samples from 13 dogs at each testing phase (pretreatment, treatment, posttreatment).

A total of 16,649 Amplicon Sequence Variants (ASVs) were identified after filtering out sequences from the Archaea domain and unidentified sequences. This extensive sequencing effort highlights the depth of the microbial analysis performed.

petsie⁻

Results and Discussion

The study demonstrated that Petsie **significantly improved canine oral health.**

Analysis from the 13 dogs showed a major shift in oral microbiota, notably a **significant decrease in Porphyromonas**, a bacterium linked to periodontal disease. This decrease was most evident in the posttreatment phase, highlighting the toothbrush's **effectiveness in combating dental diseases.**

Additionally, increased levels of Fusobacterium in posttreatment samples indicate that Petsie not only **diminishes harmful bacteria but also enhances beneficial commensal bacteria**, essential for oral health.

These outcomes **validate the efficacy of electrolytic technology** in dog oral hygiene, suggesting a notable **advance in pet care.** The results also point to further research opportunities, especially in long-term benefits and determining the optimal usage frequency of such technologies.

Metal rods for electron transfer

Broader Research on Canine Dental Health

Further research underscores the critical importance of maintaining canine dental health. According to a study reported by the Royal Veterinary College through their VetCompass program, **dental diseases rank as the most common health issue among dogs in the UK.**

Additionally, a comprehensive analysis in an article from the PMC highlights **the link between periodontal disease and systemic health complications**, reinforcing the necessity for effective oral hygiene practices.
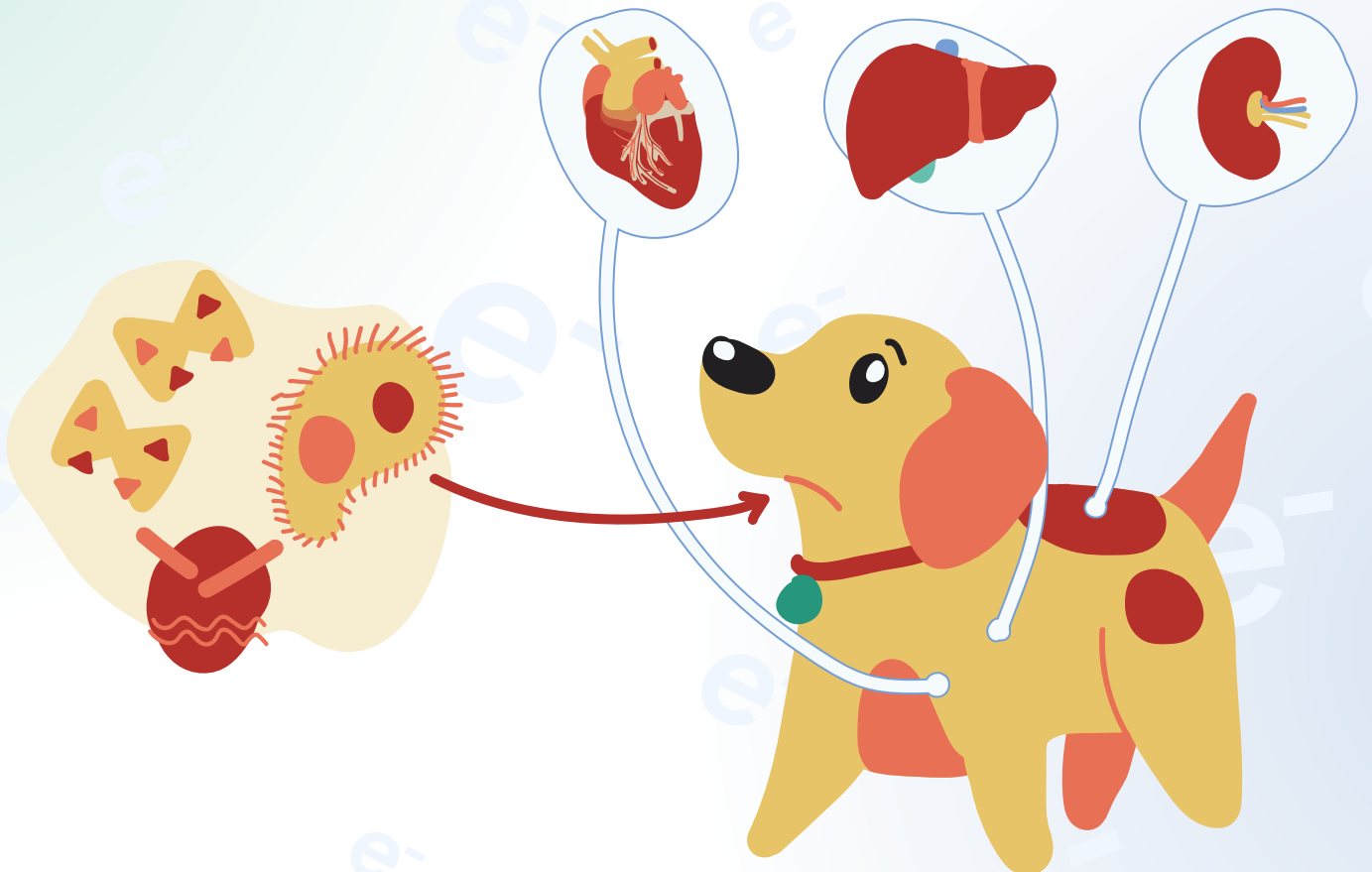
Conclusion

This clinical study demonstrates **the effectiveness of Petsie** in enhancing canine oral health.

Metagenomic sequencing revealed significant reductions in Porphyromonas and increases in Fusobacterium, **indicating improved dental and overall health.**

The results support Petsie as a **crucial tool in preventive veterinary care**, highlighting its potential to prevent systemic health issues linked to dental diseases.

If you want to see a microscopic video of the bacteria extraction click here.

References

Malešević, M.,. "Impact of Petsie Smart Toothbrush on Canine Oral Microbiota." University of Belgrade – Institute of Molecular Genetics and Genetic Engineering, 2023.

"VetCompass: Get Brushing; Dental Disease Tops the List of Most Common Problems in UK Dogs." Royal Veterinary College, 2023. RVC Link

"Periodontal Disease in Dogs: A Clinical Research." PubMed Central, 2023. PubMed Link

Novogene Sequencing Center, Cambridge, UK. Data processing and metagenomic sequencing details for Petsie toothbrush study, 2023.

qiime2 2023.2 Documentation. QIIME2 Document Link

SILVA Ribosomal RNA Database, Version 138. SILVA Database Link

petsie⁻