

Abstract

This study examines the canine skin microbiome, its role in health and disease, and the factors influencing its balance. The clinical impact of dysbiosis in conditions like dermatitis and pyoderma is explored, alongside emerging therapies like probiotics. Insights aim to improve clinical management and enhance canine dermatological health.

Objectives

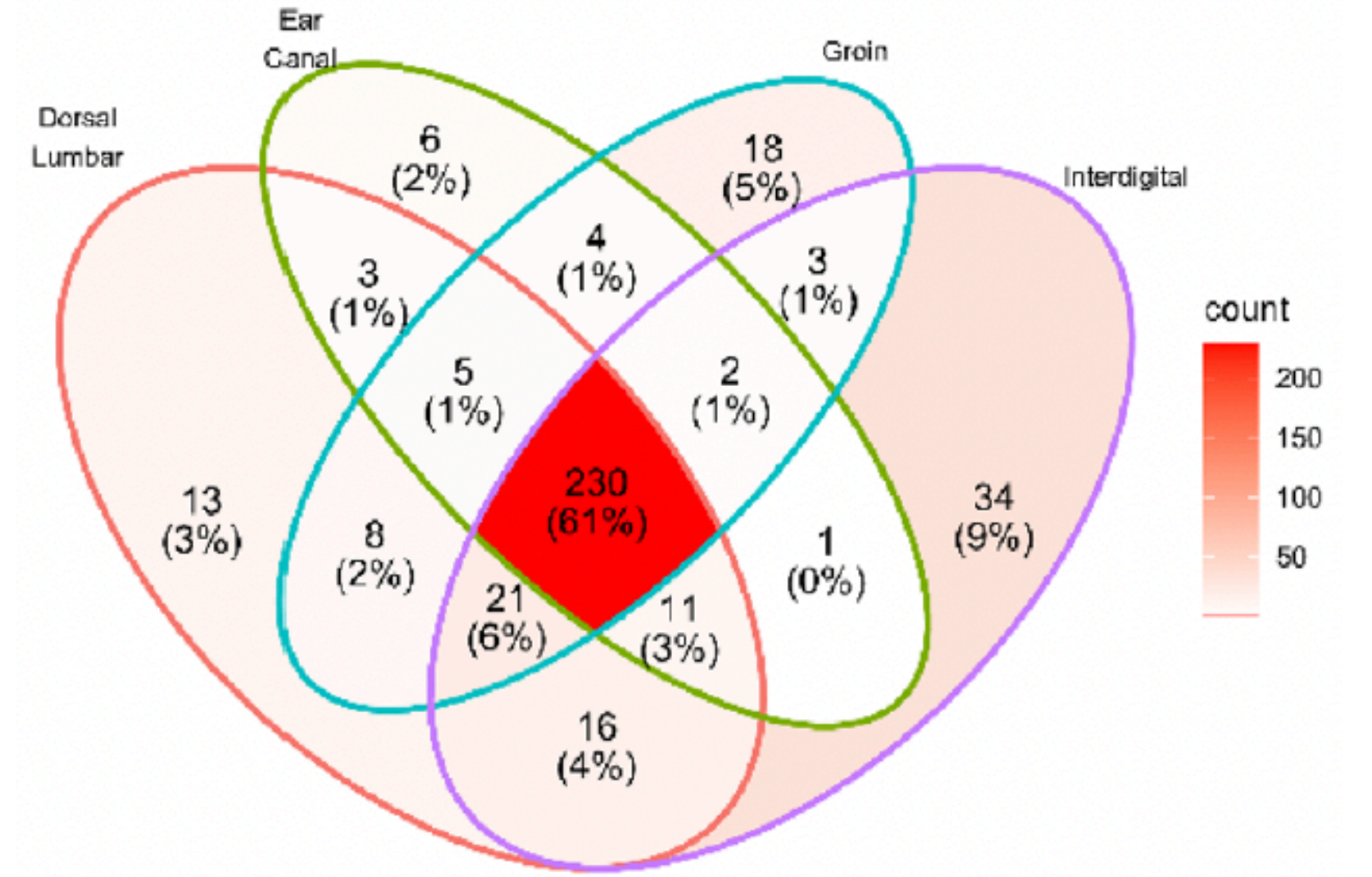
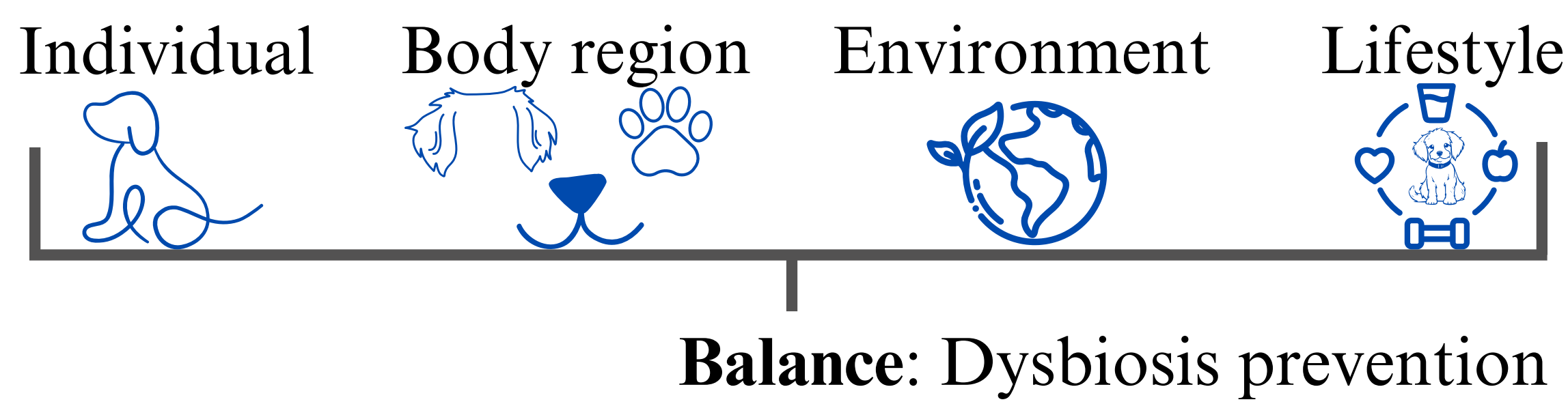
- Explore the **clinical implications**, analyzing its composition in health and disease.
- Identify factors influencing structure and functionality.
- Evaluate the **impact** of microbial dysbiosis
- Highlight emerging **therapeutic strategies** and spot future research directions.

Introduction

Crucial role in dermatological health and disease

↪ Symbiosis: skin defense (barrier and immunity)

Influenced by:



Results

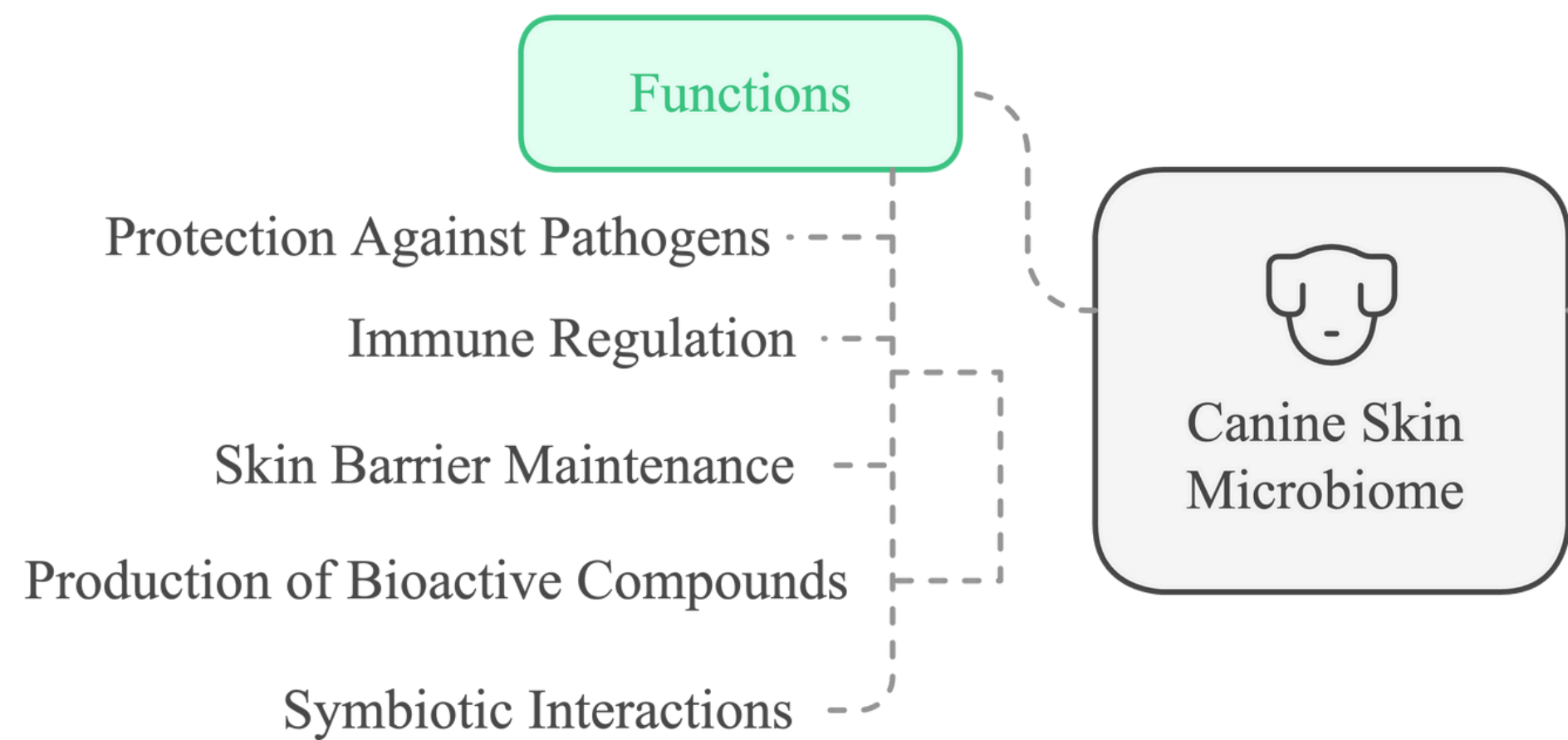


Fig 2: Canine Skin Microbiome - Functions

Dysbiosis: imbalance in the composition, diversity, or functionality of the microbiome, disrupting the symbiotic relationship between host and microorganisms. This imbalance can be often associated with conditions such as the following.

Atopic dermatitis

Disruptions to the skin barrier and dysbiosis play a key role.

- Impaired barrier:** allows allergen penetration, loss of moisture.
- Dysbiosis:** exacerbates inflammation and immune dysfunction.

Generating a cycle of barrier damage, microbial imbalance, and chronic inflammation. Predominance of *S. pseudintermedius*.

Ceramide profiles show to be altered, leading to lipid disorganization, increased susceptibility to infections, and dehydration.

Evidences found:

- Increased TEWL correlates with lesion severity, indicating barrier dysfunction.
- Reduced pH is associated with decreased bacterial diversity.
- Lower diversity, measured by the Shannon index, correlates negatively with clinical severity and TEWL. Often reflects dominance by a few species, disrupting the microbial balance.

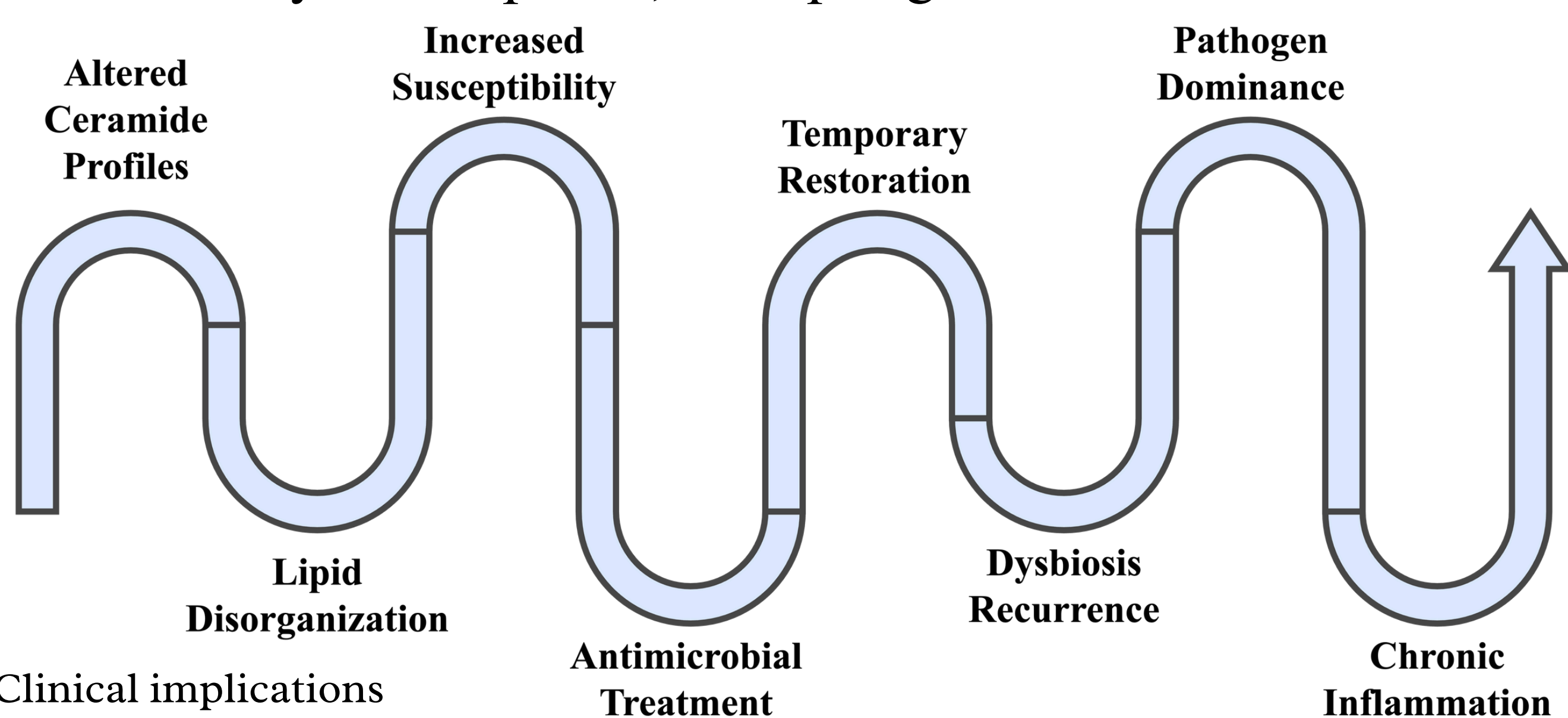
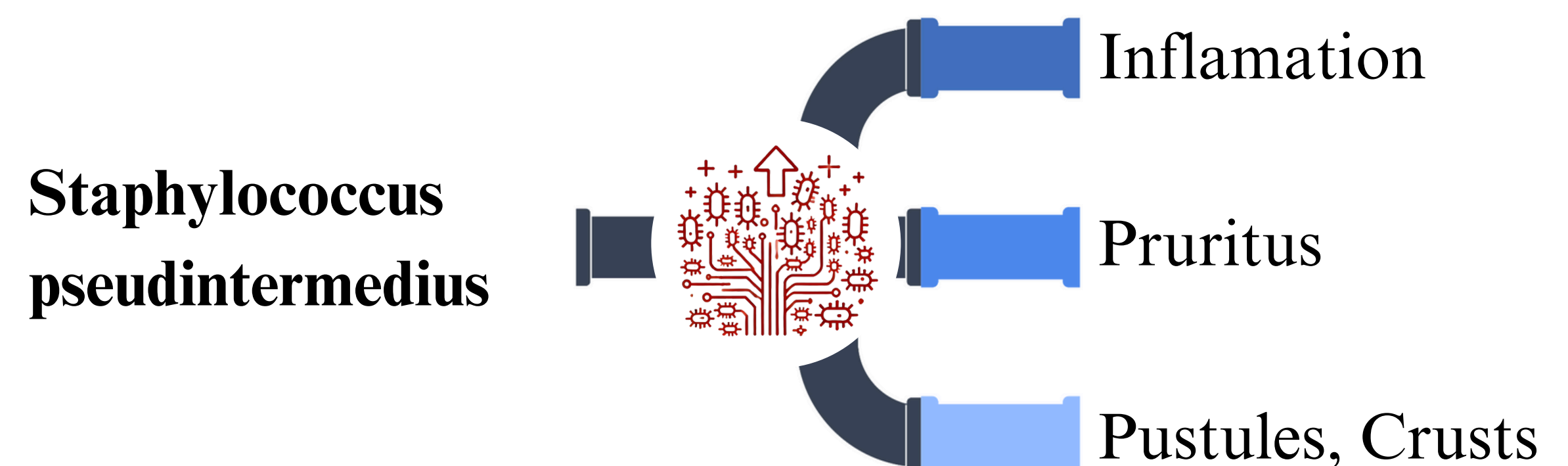


Fig 3: Clinical implications of Atopic dermatitis

Pyoderma



Advanced metagenomics have revealed the coexistence of **resistant and sensitive strains** in affected skin.

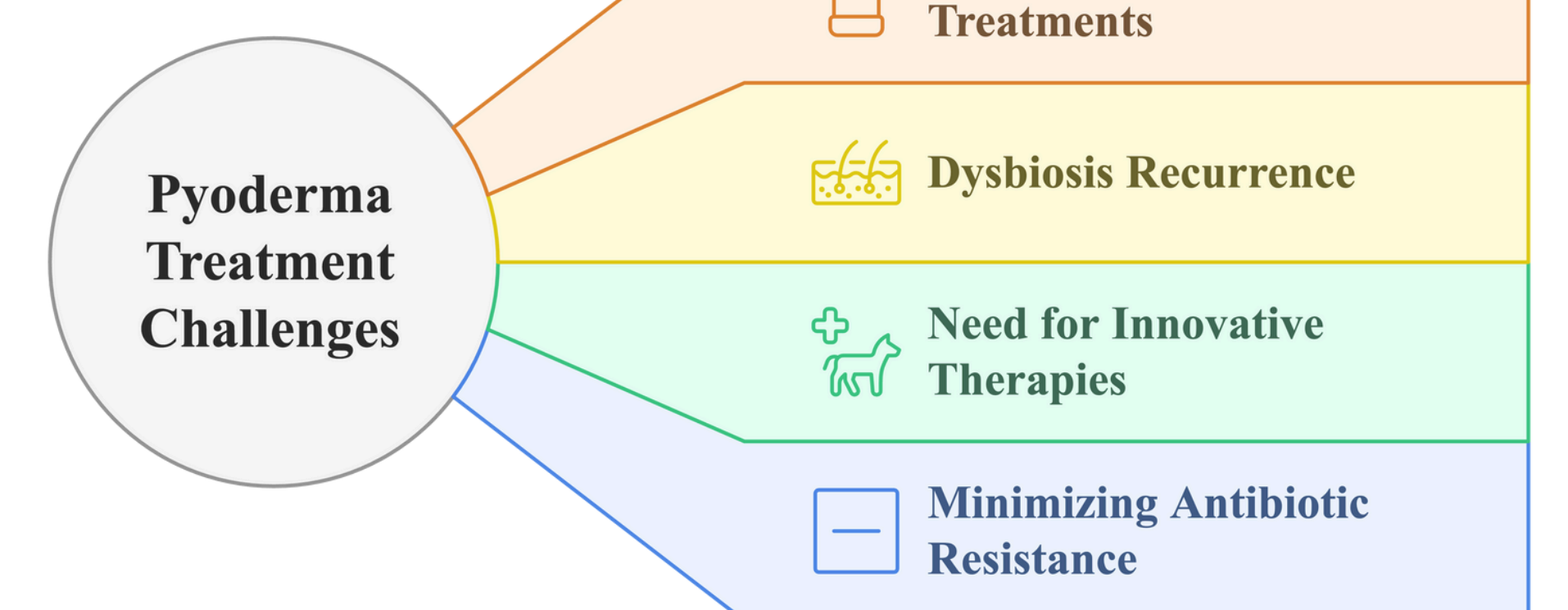
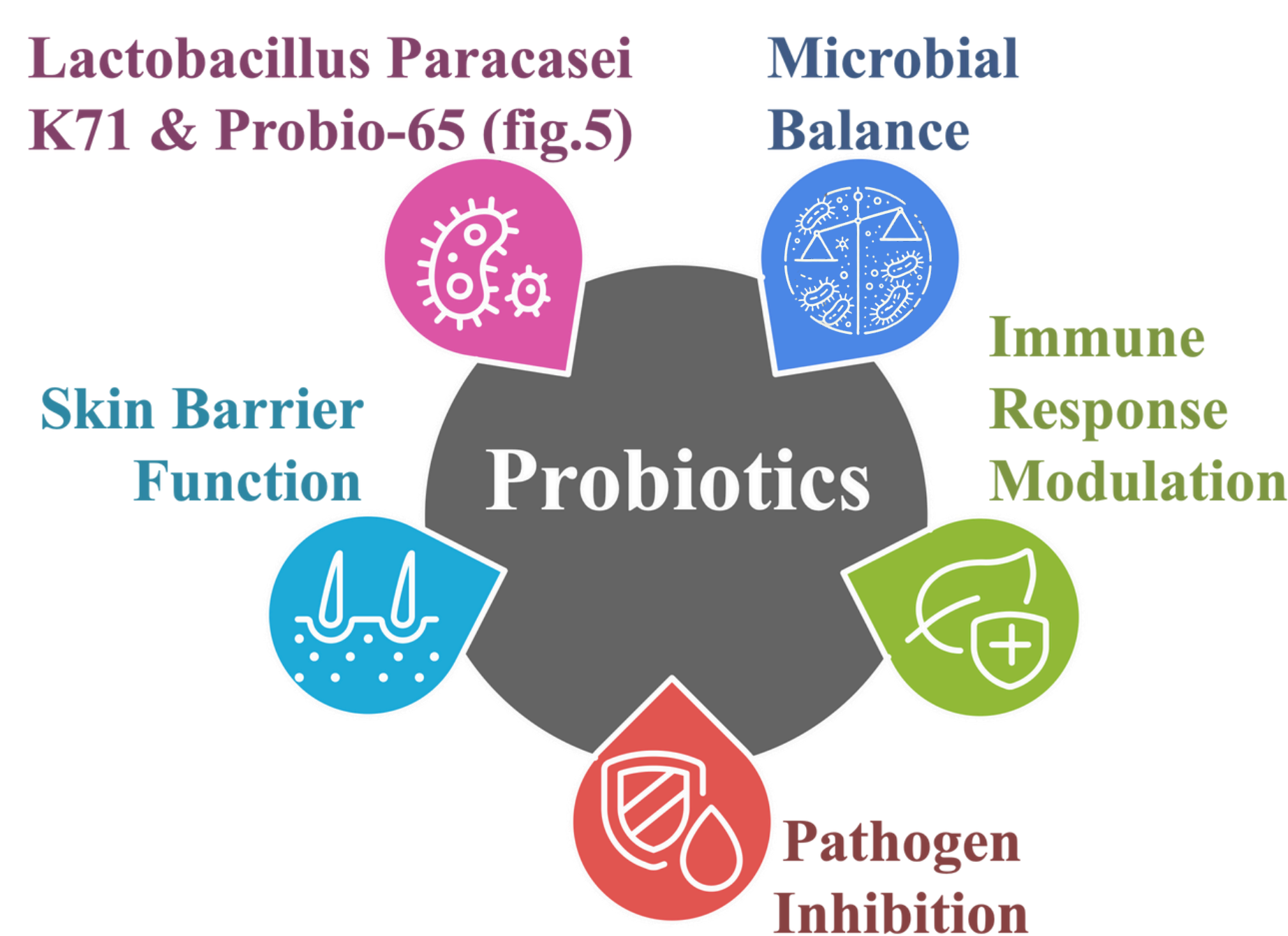


Fig 4: Cycle of pyoderma treatment

New Therapeutic Strategies: Use of Probiotics



	After Treatment		
	Start	1 month	2 month
Tail			
Foot			

Fig 5: Improvements in affected CAD dogs after *L. sakei* probio-65 administration

Challenges: standardize protocols, optimize dosage, and validate long-term efficacy.

Conclusions

- The skin microbiome is **crucial for maintaining skin health:** preventing infections and regulating immune response.
- Dysbiosis** plays a significant role in dermatological diseases. Explains the need for therapies that restore microbial balance.
- New **sequencing technologies:** deeper understanding and early diagnosis.
- Probiotics** offer promising alternatives: less antibiotic dependance and resistance. Enhances long-term clinical outcomes.
- Future perspectives:** personalized treatment approaches. Transformative potential in veterinary dermatology and patient care.