

GLOBAL SKIN HEALTH

ULTRASTRUCTURAL ORGANIZATION, LIPIDS AND MICROBIAL COMPOSITION OF THE NOSE FOLLICULAR CAST: AN UPDATED VIEW

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Background: Follicular casts (FC) consist of keratinized material, cell detritus, lipids bacteria and fungi. They have been described to be preferentially colonized by Cutibacterium acnes (formerly Propionibacterium acnes), which could in turn affect the lipid composition through metabolic activities. These structures are present on acneic and on non acneic lesions. Although FC of acneic lesions have been previously described in the literature, a detailed characterization of non-acneic FC is poorly reported.

Objective: The aim of the study is to perform a complete characterization of FC of non acneic casts comprising on structural organization, lipids and microbiota composition.

Materials and Methods: The FC were extracted from the nose of subjects from clinical studies using nose strips, from which each cast was manually harvested. A subset of FC was further processed for either structural examination using microscopy methods (TEM/SEM), lipid (GC-MS) and bacterial (16S rDNA) and fungal (ITS1) microbiota profiling.

Results: Ultrastructural FC images confirmed the presence of a thick unorganized stack of cornified cells and lipids. Casts contained a varying number of fibers in which melanosomes are observed. The images also revealed the presence of high density of bacteria and yeasts localized in specific central areas.

Microbiota profiling identified Cutibacterium sp. and Malassezia sp. as the most abundant bacterial and fungal species respectively. Lipid analysis indicated higher FFA levels in the casts than in the excreted sebum at the skin surface, which could be explained by a metabolic contribution of Cutibacterium and Malassezia through lipase activity inside the FC.

Conclusions: Altogether our results present an updated comprehensive characterization of the FC at the structural and composition level, that could help to understand the











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development of FC and consequently develop new cosmetics approaches.



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