

RESEARCH TOPIC PRIME11

Personalized prediction and monitoring of treatment response in vitiligo through NanoString molecular profiling and reflectance confocal microscopy

Thematic field of the project

Biomedical sciences

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Main field of interest

Dermatology, autoimmune skin diseases, precision medicine, molecular diagnostics, non-invasive skin imaging, immunology.

Abstract

Vitiligo is an autoimmune depigmenting disorder characterized by heterogeneous clinical behavior and variable response to treatment. This PhD project aims to develop a personalized approach to the assessment and prediction of therapeutic response in vitiligo by integrating clinical evaluation, NanoString-based molecular profiling and reflectance confocal microscopy. Patients undergoing treatment for vitiligo will be longitudinally monitored through validated clinical scores, standardized digital imaging and non-invasive confocal assessment of lesional, perilesional and repigmenting skin. NanoString analysis will be used to characterize immune, inflammatory and melanocyte-related molecular signatures associated with disease activity, repigmentation patterns and treatment response. By combining clinical outcomes, molecular phenotypes and digital histology features, the project aims to identify predictors of response and support individualized therapeutic strategies for patients with vitiligo.

Main technical approaches

- Longitudinal clinical assessment of vitiligo severity and response using validated scores such as F-VASI, T-VASI and patient-reported outcomes.
- Reflectance confocal microscopy for non-invasive digital histology of lesional, perilesional and repigmenting skin.
- NanoString-based molecular analysis of immune, inflammatory and melanocyte-related pathways.
- Development of a translational response model combining clinical, molecular and imaging variables.

Scientific references

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Type of contract

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