





Unveiling skin microbiome patterns through data mining techniques: towards a multi-omic perspective

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Abstract:

Revealing skin microbiome patterns is now a hot-topic, finding different fields of interest, from microbial ecology to medicine and diagnostic application. Supported by the boost in technological advances in omic sciences, large amounts of data from skin metagenomics studies have been deposited on international public databases, representing a valuable resource for the research community.

In order to investigate skin-related microbiome patterns, we created and re-analyzed a curated collection of skin metagenomics datasets, enriched with study-related metadata, i.e. the SKIOME collection, and applied microFIM, a data mining tool based on supervised machine learning procedures developed by us, able to reconstruct microbiome patterns. Considering previous research, our results showed that microFIM can resume the taxonomy information collected in microbiome data. Due to the complexity of microbiome and the different level of analysis that omic sciences offer, we are now implementing different omics sources, bringing skin microbiome research towards a multi-omic perspective.

Our work may result in a ready-to-use multi-omic collection of skin microbiome datasets, favoring data reuse and data integration approaches. Moreover, our work sets microbiome research at the nexus of many subdisciplines, offering the potential for non-invasive diagnosis and condition monitoring.