

The Skin Microbiome – Investigations on Skin Malignancies and Preterm Newborn Skin

ALEXANDER SALAVA

Skin and Allergy Hospital, Helsinki University Hospital, Helsinki, Finland

A dissertation with the title “The skin microbiome - investigations on skin malignancies and preterm newborn skin” took place on April 6, 2018 at the auditorium of the Skin and Allergy Hospital, Helsinki University Hospital, Helsinki, Finland. Supervisor: Prof Antti Lauerma, Skin and Allergy Hospital, Helsinki University Hospital, Helsinki, Finland. Opponent: Prof Tilo Biedermann, Department of Dermatology and Allergology, Thechnical University of Munich, Munich, Germany. The thesis is available at: <https://helda.helsinki.fi/bitstream/handle/10138/232567/THESKINM.pdf?sequence=1>

Skin disorders have been associated with specific microbiome changes and raised an interest in developing new diagnostic methods and treatments. Our object was to investigate the microbiome in skin cancer (melanoma) and inflammatory skin disorders (parapsoriasis) and to explore the skin microbiome in very low birth weight infants in intensive care and possible association to neonatal sepsis.

Microbiome samples were taken of 15 cutaneous melanomas and 17 benign melanocytic naevi, of 13 patients with parapsoriasis and 12 very low birth weight infants during treatment in intensive care. Sequencing was carried out on 454 GS-FLX Titanium and Illumina MiSeq platforms and the data was analyzed by bioinformatics. There were no significant differences in the microbiome of melanomas, melanocytic naevi and controls. Additionally, the microbiome showed no significant differences between parapsoriasis and the same patient’s healthy skin. We observed a high cutaneous microbial diversity in most of the infants at birth and there was a decrease in diversity during the first three weeks of life. There was no association between microbiome changes and neonatal sepsis.

The results suggest that microbiome swab sampling may not be helpful in diagnostics of melanoma or parapsoriasis. Moreover, microbiome changes seem not to play a role in parapsoriasis. We could demonstrate that very low birth weight infants in intensive care have a high cutaneous microbial diversity during the first days of life regardless of the way of delivery, prematurity causes or perinatal infections. The diversity decreases during the first weeks of life possibly due to intensive



Fig. 1. From left to right: Prof Tilo Biedermann (Opponent), Prof. Antti Lauerma (Supervisor), Alexander Salava (Respondent).

care treatment and antibiotics. Neonatal sepsis is not linked to microbiome changes and it is likely that other factors play a role, e.g. skin injury by medical devices and concomitant infections.

Publications

1. Salava A, Aho V, Pereira P, Koskinen K, Paulin L, Auvinen P, Lauerma A. Skin microbiome in melanomas and melanocytic nevi. *Eur J Dermatol* 2016; 26: 49–55.
2. Salava A, Pereira P, Aho V, Väkevä L, Paulin L, Auvinen P, Ranki A, Lauerma A. Skin microbiome in small- and large-plaque parapsoriasis. *Acta Derm Venereol* 2017; 97: 685–691.
3. Salava A, Aho V, Lybeck E, Pereira P, Paulin L, Nupponen I, et al. Loss of cutaneous microbial diversity during first three weeks of life in very low birthweight infants. *Exp Dermatol* 2017; 26: 861–867.