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## Evaluation of the effects of stressful life on human skin microbiota

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Thanks to its immune system, human skin constitutes the first barrier against environmental aggressions such as chemical agents, physical agents or bacteria. These bacteria, viruses, archaea and fungi present on the superficial layers of the skin, correspond to the cutaneous microbiota. The many layers and structures of the skin serve as hosts to microbes, including a diversity of commensal and pathogenic bacteria that contribute to both human health and disease. The composition of microbiota is crucial in the balance of the immune system. It has already been shown that the composition of the microbiota affects the development of diseases such as atopic dermatitis (since an increase in Staphylococcus aureus has been described), but also diabetes and obesity. This microbiota imbalance is mainly related to individual factors (age), environmental (climate) and behavioral factors (hygiene, consumption of antibiotics).

In our study, we are more interesting on the effect of a stressful life on skin microbiota, and more especially on skin bacteria. We studied the skin microbiota from the face of 70 healthy human subjects (from 25 to 45 years). Firstly, we worked with 2 groups of 20 volunteers selected according to their stress level, using a validated stress score evaluation, known as Perceived Stress Scale (PSS). The PSS index were under 21 for unstressed group and up to 27 for stressed group. We also evaluated the skin parameters in the 2 groups, such as skin pH, transepidermal water loss (TEWL), skin imperfection and redness. Then, we tested the effect of a topical treatment on the skin microflora of one group of 30 volunteers with high stress index (PSS>27). We sampled using one calibrated method of collection on cheeks (4cm² per sample). Then, to determine the complexity and identity of the microbiota inhabiting the skin, we sequenced bacterial 16S small-subunit ribosomal RNA genes isolated from the face of all these 70 healthy human subjects. Our analysis revealed the operational taxonomic units (OTUs; "phylotypes") that belong to six main bacterial divisions. Diversity and richness were evaluated in the 2 groups (stressed vs unstressed) using Shannon index and Chao index, respectively.

Firstly, we will describe the main characteristics of the skin microbiota (species and number) on the stressed group compared with unstressed group. Then we will present the effect of the treatment on the skin microbiota of stressed group, before and after 8 days of treatment. Briefly, Actinobacteria, Firmicutes and Proteobacteria dominated the skin microbiota. Interpersonal variation was important and confirmed a strong complexity of human skin microbiota. However, we showed a bacterial signature of the stressed people compared to unstressed people, in term of richness and diversity. We also identified some species more dominant in stressed people. This original study of healthy human skin microbiota will serve to direct future research addressing the role of skin microbiota in healthy people, and metagenomic projects addressing the complex physiological interactions between the skin and the microbes that inhabit this environment.

## Biography

Pierre-Yves Morvan completed his PhD from Université de Rennes in 1995. He was a study director at Biopredic International and then joined Codif International as a Cell Culture Manager. Currently, he is the Director of R&D at Codif International. He is a member of French Society of Cosmetics.

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**Notes:**

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