Nature vs. Nurture: Do Your Genetics or Environment Affect Your Surface Microbiome More?

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Human skin is colonized by millions of microorganisms which help protect the body from harmful viruses and bacteria and keep it healthy. Previous research has shown that the human skin microbiome is incredibly diverse and includes both helpful and harmful bacteria. Factors such as diet, environment, genetics, and early microbial exposure can influence this diversity. I tested the hypothesis that a person's skin microbiome is more influenced by the environment than heredity. Prior to inoculation, petri dishes were prepared with nutrient agar. Nine test subjects from my family were swabbed three times on their hand for ten seconds before the petri dishes were inoculated. Petri dishes were photographed after five days and sixty-two days, and bacteria were counted and classified by phenotypic traits. After comparing bacteria on the petri dishes between subjects, I found that people who are genetically related have a higher percentage of bacteria in common than people who are not genetically related but live in the same household. Generally, the biological siblings in my experiment had the highest percentages of common bacteria; however, there were some interesting results where people who were not related or did not live in the same household had a high percentage of common bacteria. My results suggest that both environment and genetics influence a person's surface microbiome.