Diurnal variation in the skin microbiome affects accuracy of forensic microbiome matching

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Video Byte

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Abstract

You leave traces on every surface you touch. These traces include parts of your unique skin microbiome, and the comparison of skin and surface microbiota has potential as a forensic tool. To test this concept, a recent study analyzed the metagenome left behind on surfaces by four people. People were matched to their household in 84% of the tests and their neighborhood in only 50% of tests. Matching accuracy decayed over the test period on public surfaces, but not in homes. Time of sample collection affected matching accuracy for both skin (reference) and surface samples (query). This may be driven by diurnal routines influencing microbial dispersal from these public surfaces. Returning home likely normalizes a person's microbiome via contact with their household microbial reservoir. More research is needed with larger sample sizes and across a diverse range of situations to map out these effects and their mechanisms in more detail. However, these results suggest that the use of microbiome analysis in forensics cannot be a simple matter of comparing 'fingerprints', but instead needs to account for dynamic systems of microbial dispersal.