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MOZART: Model for Arbovirus Infection of the Skin

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Mosquito-borne viruses such as Rift Valley fever virus (RVFV) and Chikungunya virus (CHIKV) cause significant global morbidity and mortality. Transmission via mosquito bite exacerbates disease severity, likely through immunomodulatory components of saliva. To facilitate mechanistic studies under physiologically relevant conditions and reduce reliance on animal models, we established a human skin explant system for mosquito-mediated arbovirus
infection.

In the pilot "MOZART"project, we optimized ex vivo human skin explant cultures and inoculated them either by *Aedes aegypti* probing or by microinjection. Quantitative RT-PCR analysis revealed that RVFV RNA copy numbers remained stable over a 7-day period, whereas CHIKV exhibited a modest but consistent increase. Immunohistochemistry of explants, together with infection assays in primary human dermal fibroblasts and keratinocytes, confirmed that both viruses productively infect skin cells.

Building on these results, we have developed a standardized protocol for presenting ex vivo Skin explants to infected mosquitoes. This platform enables precise dissection of early cutaneous host responses to natural arbovirus transmission and supports ethically responsible research into vector–host–pathogen interactions.

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No, I am not a Junior Scientist.

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