

From: Nathan Wolfe <[REDACTED]>
To: Jeffrey Epstein <jeevacation@gmail.com>
Subject: Undergrad Study Proposal
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Hey Jeffrey

Hope you're having fun wherever you are! Here's a new shot on our horny virus hypothesis - I think it hits the sweet spot of what we've been thinking about (so to speak).

Together with a colleague at the University of Michigan, we came up with a real-time study in undergrads directly linking sexual behavior and microbial diversity that I think you'll be into. Summary below.

Of course happy to chat with you about anything anytime, but as I've pulled a broader team in on this one we should move toward a go/no-go regarding your funding on this hypothesis. Happy to elaborate and adjust a bit if this sounds good to you, and if not I'll understand too!

I'll work with Lesley to set up time for us to chat.

Best,
Nathan

Longitudinal Study of Sexual Behavior and Microbiota among College Students: Identifying microbial determinants of sexual behavior

The purpose of this study is to assess the prevalence of vaginal and penile microbiota among college students and determine whether the presence of certain microorganisms increases sexual activity. To accomplish the goals of this study, we will utilize a chain referral sexual network study design and recruit 700 university students and their sexual partners on campus to assess the prevalence, transmission and impact of vaginal and penile microbiota on sexual risk behaviors over two years of follow-up. Students will enroll in the study and nominate their sexual partners at baseline to also join the study.

As done in other studies of factors associated with influenza transmission, we will administer cell phones to participants with an application that runs on Android smartphones that can be used to track participant interactions throughout the course of the study. This application is specially designed to record and upload data on a daily basis such as the participant's geographic location on campus, physical proximity to other study participants and responses to brief context-dependent surveys regarding their sexual interactions. In addition, we will administer monthly web-based surveys in which participants will report information on their sexual interactions, libido, and nominate new sexual contacts to also join the study. Among other things, the physical proximity of participants cell phones (e.g. co-location at 3am) will provide an independent indicator of sexual activity between study participants. The system has a proven track record, and we have a substantial history of successful recruitment of study participants in this context.

The participants will be sampled for microbiota profiles at baseline and monthly throughout the follow-up period. A combination of generic molecular approaches (e.g. deep sequencing, viral microarrays) will be used to identify known and unknown microorganisms. The data from this two-year longitudinal study will enable us to track changes *over time* associated with sexual behavior and vaginal and penile microbiota and to determine if the incidence of infectious agents changes sexual behavior in those contracting them.

