

Menstruation as a Natural Biopsy—Building a Database to Fuel Early Diagnosis of Reproductive Disorders

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There exist myriad conditions which can impact female-born reproductive health. These range from heritable and environmental conditions such as cancer and non-communicable disorders like endometriosis, to communicable diseases such as STIs and pelvic inflammatory disease (PID). The range of problems associated with diagnosing these diseases vary as broadly as the conditions themselves, many of which are asymptomatic (chlamydia) or nascent and difficult to diagnose (ovarian cancer, endometriosis). These impediments handicap our ability to treat reproductive conditions early and effectively.

A tampon provides singular access to the female reproductive system: a ‘natural biopsy’, and the only non-invasive biopsy available. This unprecedented, and continual, access to reproductive tissues gives NextGen Jane an opportunity to look for molecular signatures of disease by interrogating the cells of the endometrium, cervix, ovaries, fallopian tubes and other cell types, including immune cells and bacteria found in the reproductive tract. By examining these cells from our consumers, we are able to study diseases that exclusively affect female-born people at unprecedented scale and speed.

The NextGen Jane system enables radical improvements in medical management in the following ways:

1. A tampon used *during menstruation* provides us with singular access to tissues from the upper reproductive tract - **a non-invasive, natural reproductive biopsy of endometrial, ovarian, and fallopian tube cells.**
2. A tampon used *during non-menstruation* functions as a large vaginal swab of the lower reproductive tract, and can provide us with **regular snapshots of the vaginal microbiome, as well as access to vaginal and cervical cells.**
3. *A system which no longer depends on a doctor’s visit encourages clinical engagement without the clinic.* NGJ’s sample collection system allows for remote collection anywhere, and is mailed back to a lab, eliminating the cumbersome demands of cold chain, and the burdensome logistics of planning and making an in-office clinic visit. This enables NGJ to initiate multiple biological engagements with the consumer over many years.
4. Molecular signals isolated from cells naturally shed by the reproductive system provide unprecedented insight into reproductive disorders.