POPPY: AT HOME PCOS DIAGNOSTICS

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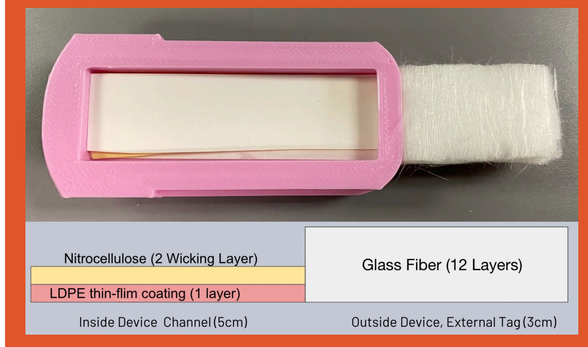
An at home testing kit to screen patients & streamline the diagnosis process for polycystic ovary syndrome (PCOS) by detecting aldosterone hormone levels in urine. poppy is an affordable device ($15usd) that requires no assembly and displays results in about five minutes. during the prototyping stage, the 3D printed case model, competition assay, and lateral flow design were tested and evaluated in terms of ergonomics, accuracy, and absorbent time.

FLUID FLOW AND PHYSICAL DESIGN

- The fluid flow portion of POPPY was tested in a lab to test different material absorbent times. Twelve layers of glass fiber along with two nitrocellulose wicking layers and a LDPE thin-film coating were deemed best fit for fluid flow up the device to administer results in five minutes while allowing enough time for the competition assay.
- A layer of 12 nitrocellulose strips, 5 cm long, creates a 5-minute wicking time for the urine to reach the test line. The glass fiber pads, which the patient will urinate on, allows for 5 mL of absorbance for all 12 layers. Finally, the LDPE thin-film used will prevent degradation of the device.
- The ergonomics of the 3D printed design was tested using survey data. The survey indicated an overwhelmingly positive result for our final model (n=20, 84%). The slimmer design allowed for a reduction of materials and application improvements.



OPPORTUNITY

Currently, PCOS affects over 5 million women, and can cause infertility, ovarian cysts, and other physically painful and uncomfortable symptoms. Additionally, PCOS is the most common endocrine disorder found in women. The current diagnosis process for PCOS is expensive, intensive, invasive and requires access to a physician and healthcare.

There are currently no at-home diagnostic kits that explicitly address or aid in the screening process for PCOS, which allows for a large market size. Our device would provide a quick and painless screening in under 20 minutes to streamline the diagnosis process.

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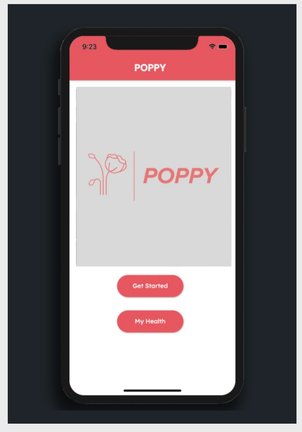
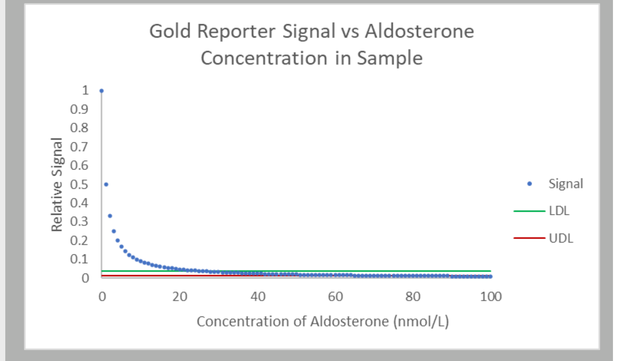
COMPANION TRACKER

- Free companion tracker app to be released with the device.
- At-home testing kit can be paired to the app via QR code.
- Additionally functions as a monthly-hormonal symptoms tracker



SIGNAL ASSAY DESIGN

- POPPY uses a competition assay format to produce a semi-quantitative signal.
- As urine flows through the device, it will wash gold-labeled Aldosterone molecules previously conjugated onto the strip at a concentration of 0.96 nmol / L down the strip along with the naturally produced Aldosterone already in the urine.
- These two types of Aldosterone molecules will competitively bind to rabbit monoclonal Anti-Aldosterone antibodies that are conjugated to the end of the strip at a concentration of 1 nmol / L.
- Based on the concentration of gold-labeled Aldosterone molecules bound to the antibody, either a visible, semi-visible (faint), or no line will appear after 20 minutes.
- After 20 minutes, there will be no visible result if the Aldosterone concentration in the urine is above 89 nmol / L (a clear indicator of PCOS), a semi-visible line will appear if the Aldosterone concentration in urine is below 89 nmol / L, and a strong visible line will appear if the Aldosterone concentration in urine is less than 25 nmol / L.
- The signal for a given concentration can be modulated by additional reporter molecules for amplification purposes.



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