Continuous hormone monitoring,

addressing a major unmet midlife need in women’s health

Presented by
Valerie Horsley, PhD
Professor MCDB and Dermatology

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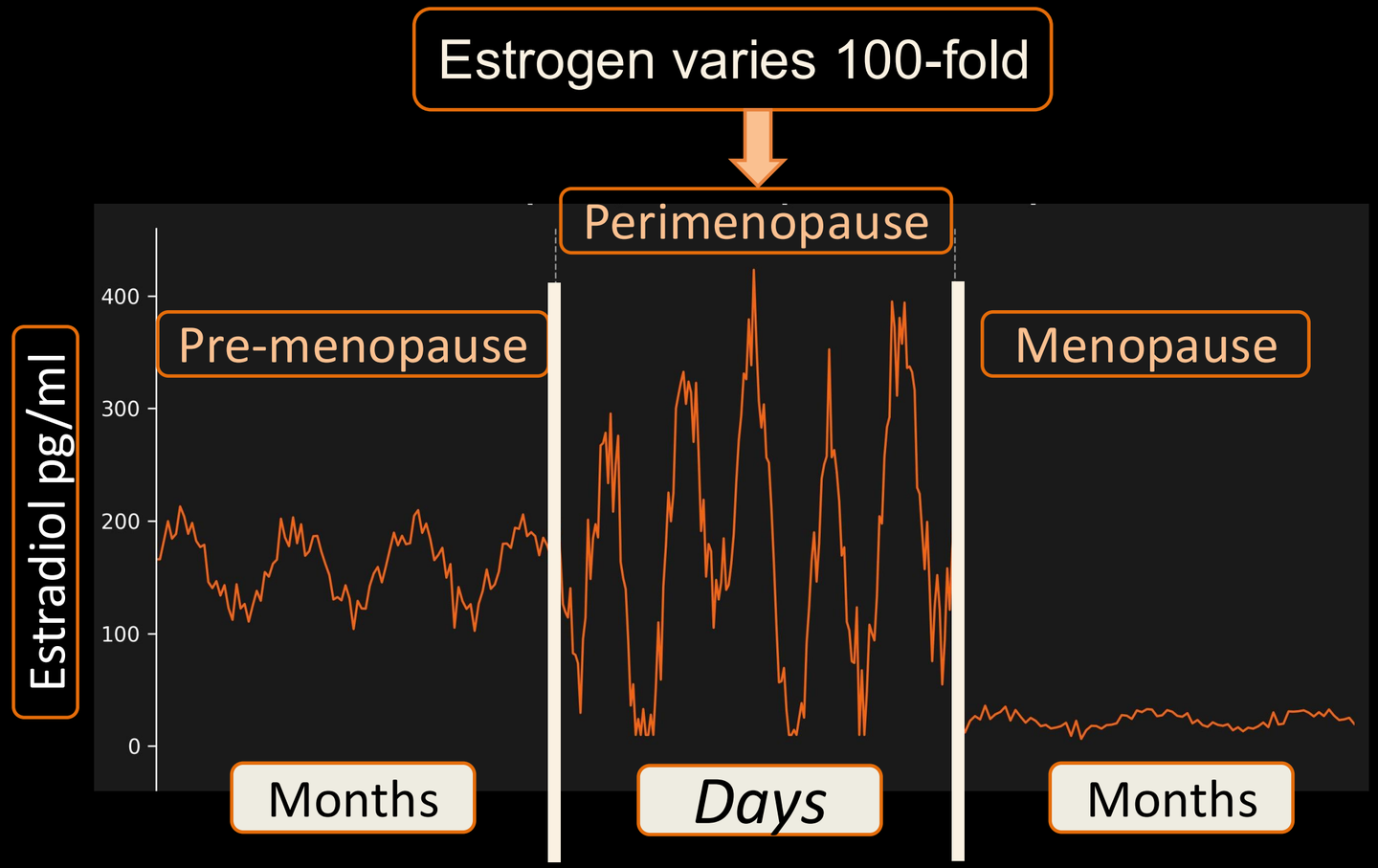
Every woman going through perimenopause is flying blind



1.3 billion women worldwide

Up to **10** years of symptoms | **0** objective diagnostic tests

How EstraFlow works

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Continuous Monitoring

A microneedle patch detects estradiol in interstitial fluid

Electrochemical Adaptasensor

Validated sensitive molecular hormone detection

our differentiator

Two Parallel Sensors

one hedge, double the confidence

Aptamer-based

Published · Ye et al. 2023 · 0.14 pM detection

Enzyme-based

Proprietary · Yale · platform validated; estradiol in development

Companion

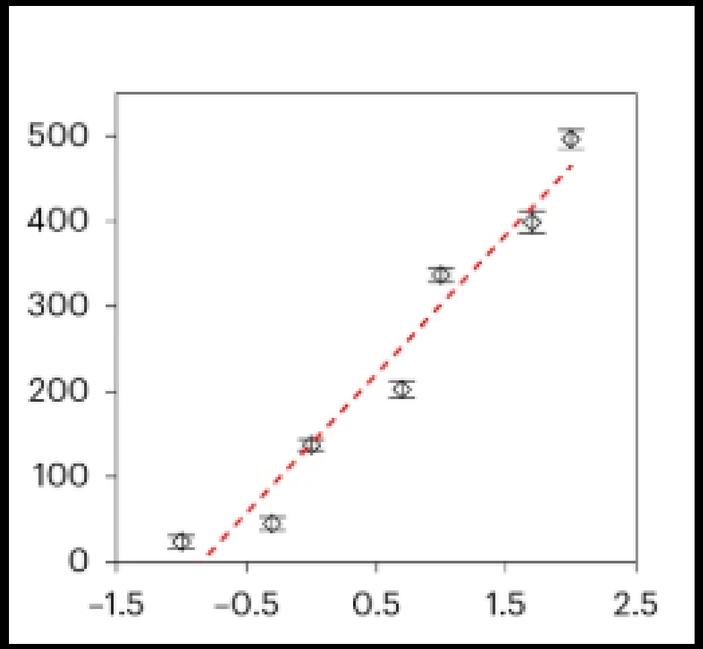
app with estradiol readout

Real-time tracking of cycles, symptoms, and treatment response over time

No one else has this combination

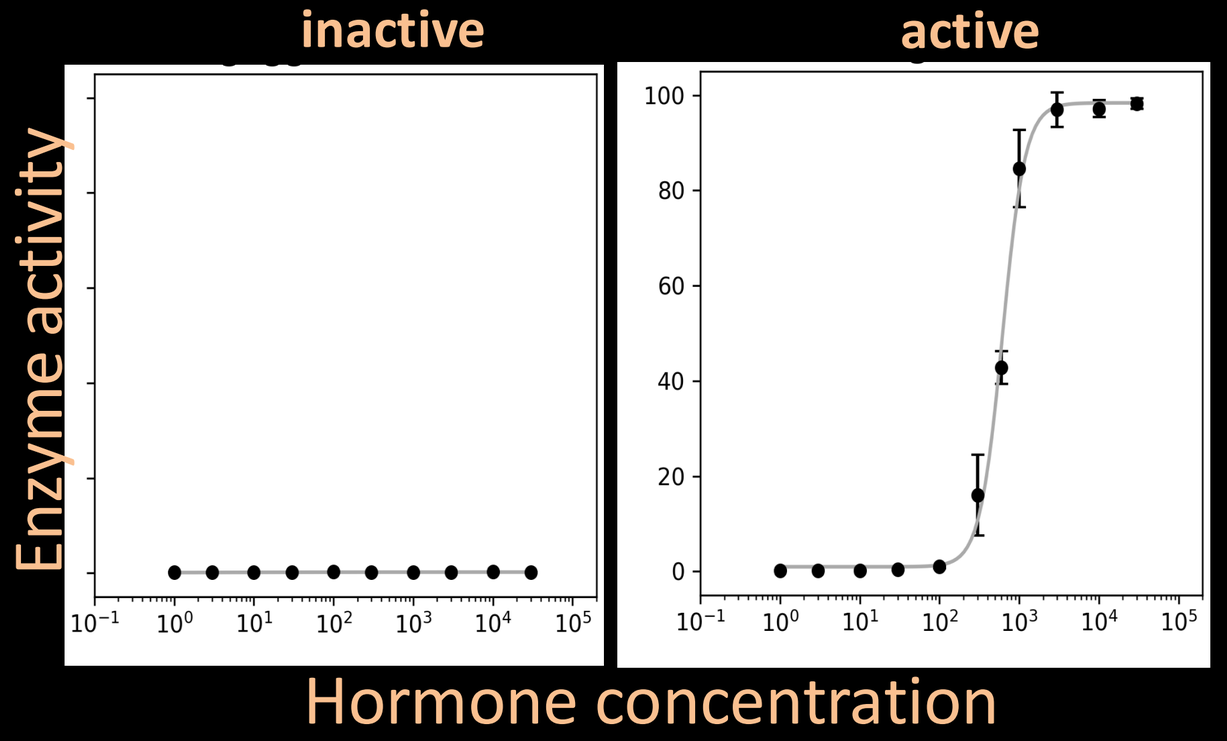
DNA hormone sensor
Published chemistry

Ye et al., Nat. Nanotechnol. 2023



Enzyme hormone sensors:
Proprietary data

Enzyme sensor, Isaacs lab, Yale



Published + proprietary technology

Intellectual property

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Patent search

No blocking IP identified

USPTO + Google Patents database search
Enzyme-based microneedle technology is novel

Unique position

Horsley lab skin biology +
Isaacs lab enzyme platform

Timeline

Claim family 1

Composition of Matter + Method

Enzyme-based electrochemical detection of steroid hormones

Multi-analyte extendable: progesterone, testosterone, cortisol

Isaacs lab, Yale

Claim family 2

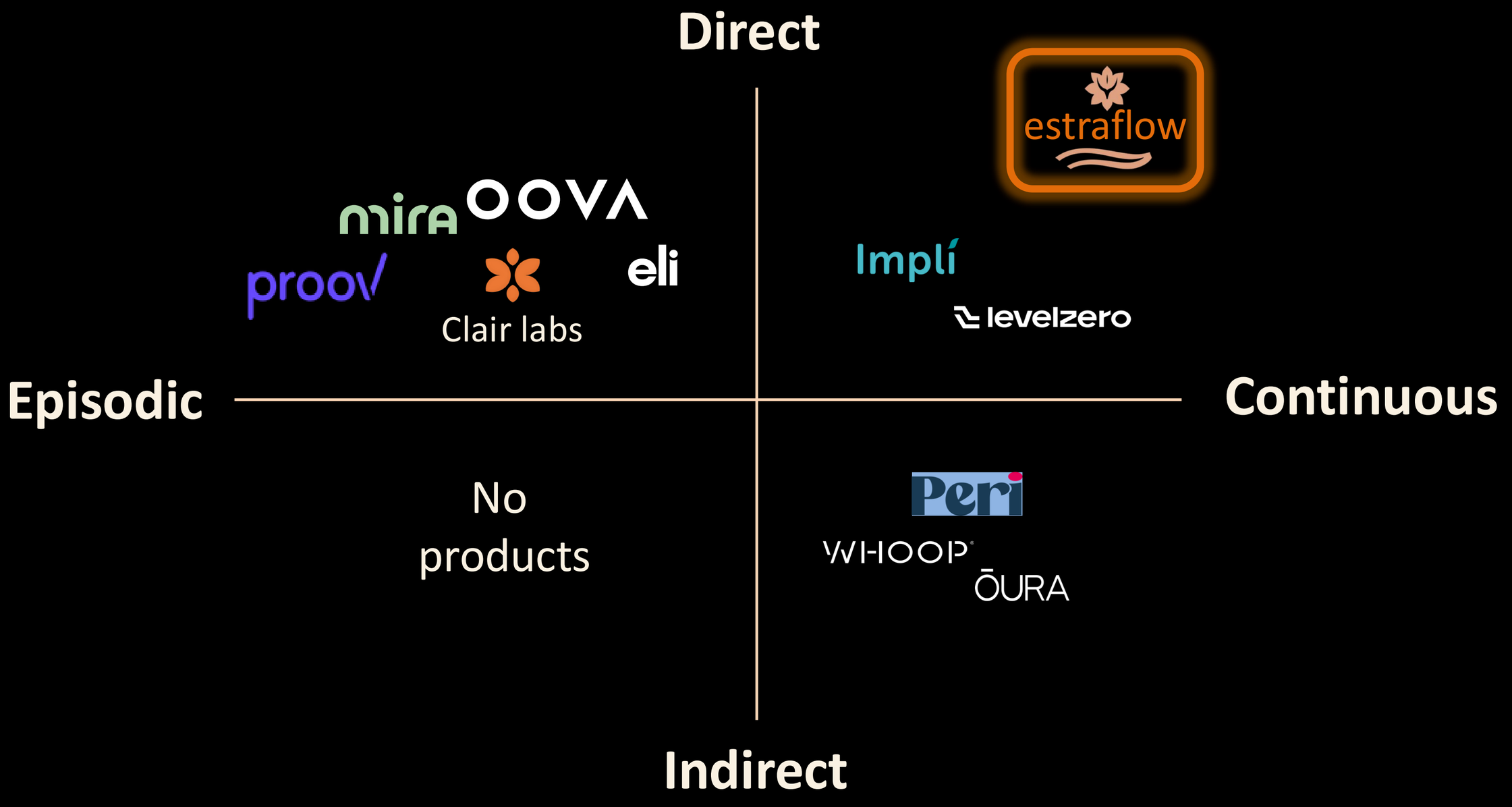
Method of use

DNA aptamer-based detection of estradiol in interstitial fluid via microneedle patch

Product **Built on Ye et al., Nat. Nanotechnol. 2023**

Provisional patent in preparation with Yale Ventures — filing Q3 2026

Estraflow is the only US-market, estradiol-specific product



Every woman being dosed by intuition is a potential EstraFlow patient

$75B

Global women's health market by 2033

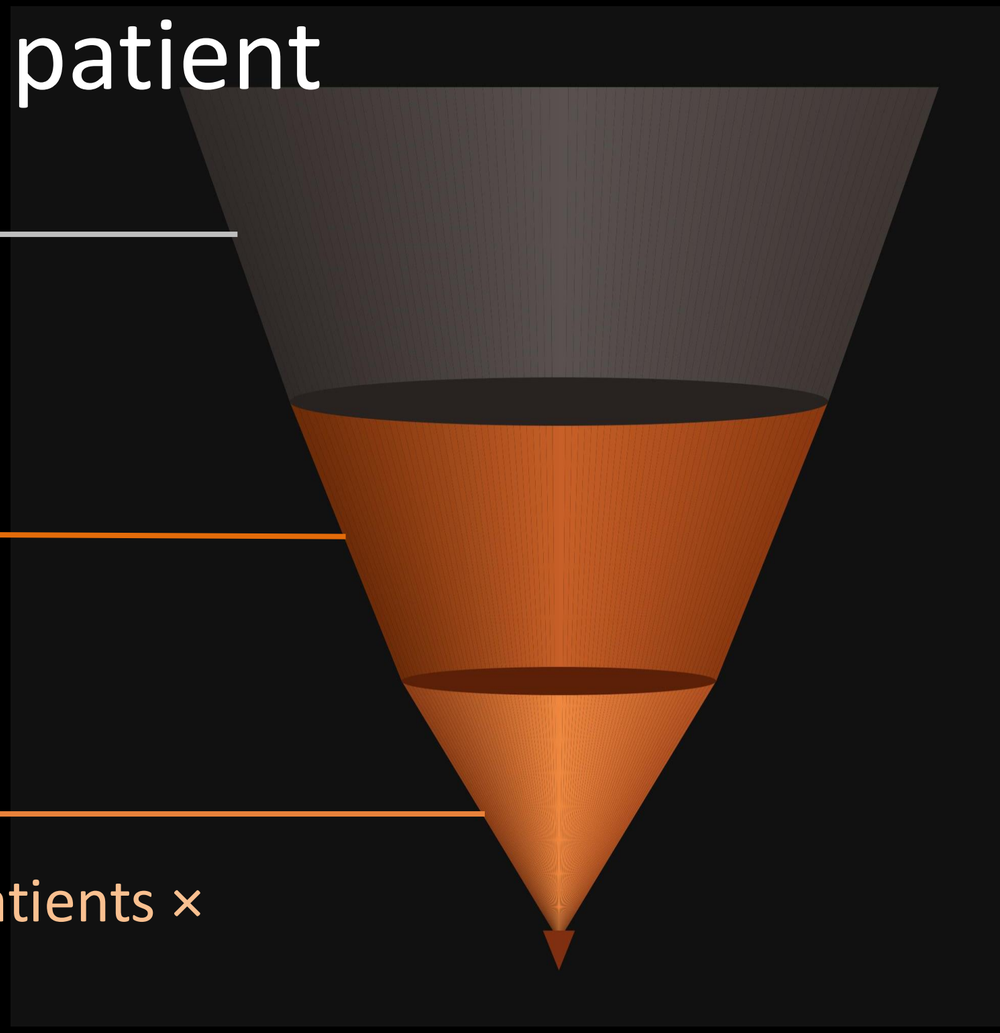
Grand View Research 2024

$12B

12M active US HRT patients × $1,000/yr

$2.4B

Year 5 — 20% of 12M active HRT patients × $1,000/yr



Near-term expansion:

Untreated symptomatic US women: 42M | Surgical menopause: 600K/year | Transgender monitoring: 1.6M

Platform vision:

Global HRT monitoring: $50B market by 2033 | Estrogen suppression in breast cancer 4M | 500K IVF cycles

Our advantages

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PRECISE AND FOCUSED

Estradiol-specific, perimenopause-first, US market.

TWO TECHNOLOGIES, ONE HEDGE

Aptamer-based and enzyme-based in parallel. If one hits a wall, we pivot.

CLEAR IP PATH

Two claim families with Yale Ventures. No blocking IP.

Enzyme architecture is multi-analyte extensible:
estradiol-first by design, not by limitation.

Meet the Founding Team

Biology

Valerie Horsley, PhD

Yale MCDB & Dermatology
Skin biology, ISF access

Farren Isaacs, PhD

Yale Systems Biology and MCDB
Enzyme-based hormone detection

Device Engineering

Claudia Cea, PhD

Yale Electrical Engineering
Flexible electrode - skin interface

Clinical

Michelle Telfer, DNP, MPH, CNM, FACNM

Yale School of Nursing
Women's health, perimenopause

Lubna Pal, MD

Yale School of Medicine
Director, Menopause Program

$30K Seeds a $12B market

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Discovery phase

Solution-based proof of concept

6 months to go/no-go data

$30K
incl. personnel

Aptamer-based sensor

1. Estradiol binding curve
2. Apparent Kd characterization
3. Specificity panel

Output: **Go/no-go decision** for electrode integration

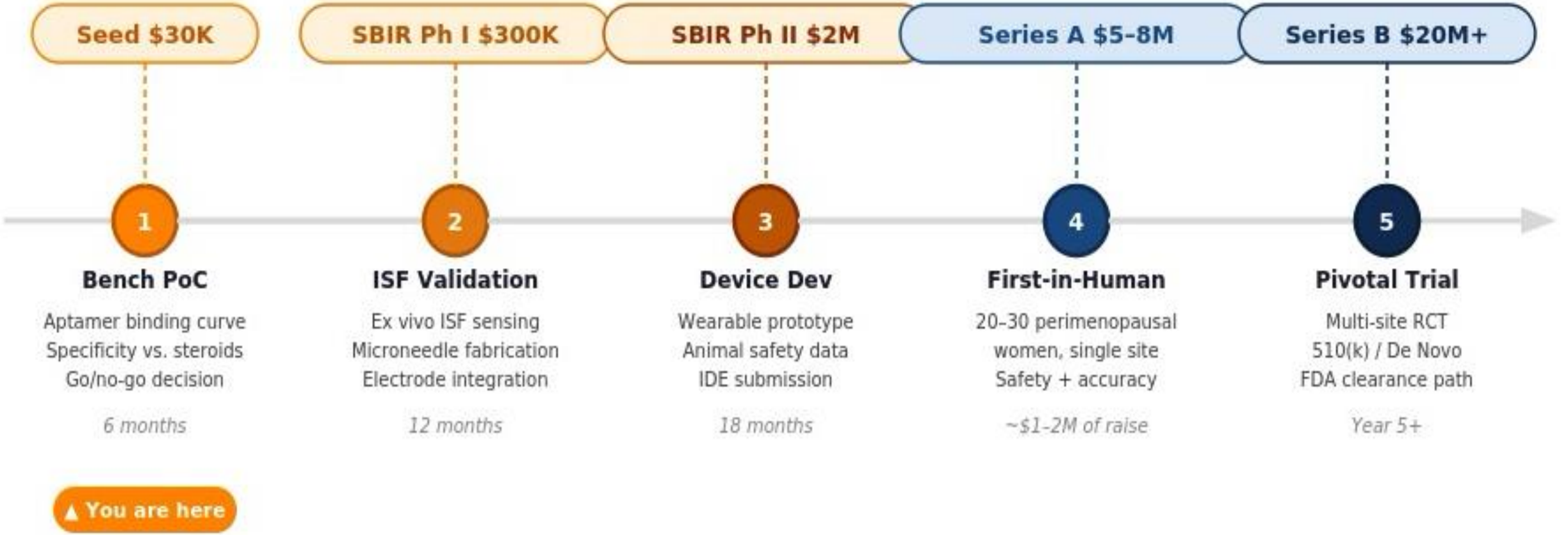
Enzyme-based sensor

1. Estradiol adaptation assay
2. Dose response characterization
3. Proof of estradiol detection

Output: **Data package** for feasibility phase application

$30K positions EstraFlow → $200K seed → first in-human study ($2M)
That's the path to a $12B market

EstraFlow: Path to First-in-Human



$30K seeds a $300K roadmap · $300K seeds a $2M roadmap · $2M seeds a $780M market