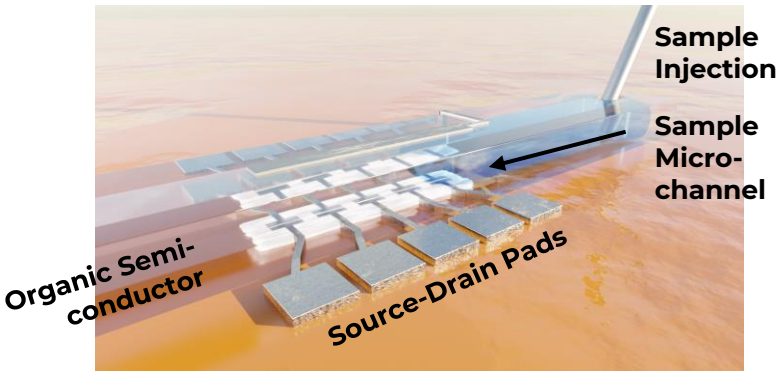
Next Generation Point-of-Contact Salivary Bio-Analyzer

The challenge	A reliable, low-cost, non-invasive Point-of-Contact(PoC) device that can utilize non-blood biological samples and quantitatively measure multiple useful biomarkers (hormone, proteins, small molecules) that associated with health and disease onset/progression.
The solution	A next generation PoC Salivary Bio-analyzer—a multitarget biosensor for quantifying biomarkers in saliva samples for diagnosis and healthcare tracking.
Key Benefits	• Disposable, cost-effective device. • Multiplexing capabilities to detect and quantify multiple analytes side-by-side. • Low sample volumes required: 10µL for each analysis test. • Excellent sensitivity and specificity to target analyte, while being independent of presence of additional materials in bio-electrolyte solution. • Broad range of detection (over seven orders of magnitude variation in analyte concentration, from 27.3 mM to 2.73 pM). • Room temperature storage and device fabrication.
Development Stage	Prototype validated with salivary biomarkers of varying types (Dopamine— small molecule neurotransmitter; Cortisol — glucocorticoid steroid hormone, α-Synuclein — Intrinsically disordered neural protein)



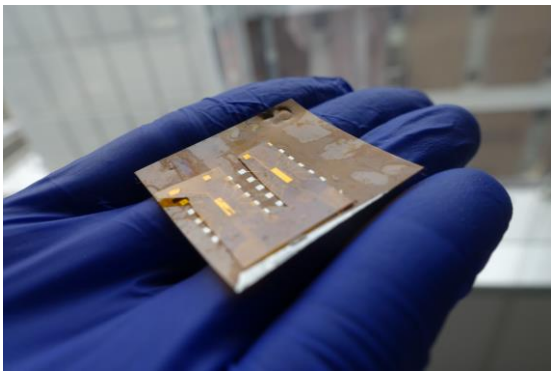


Figure 1: Schematic (left) and photo (right) of the Point-of-Contact Salivary Bio-Analyzer device

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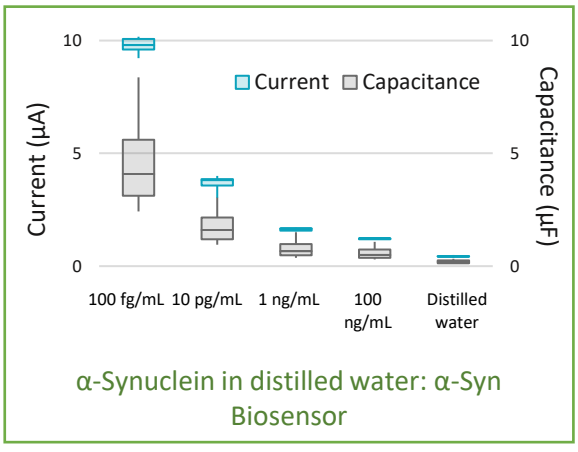
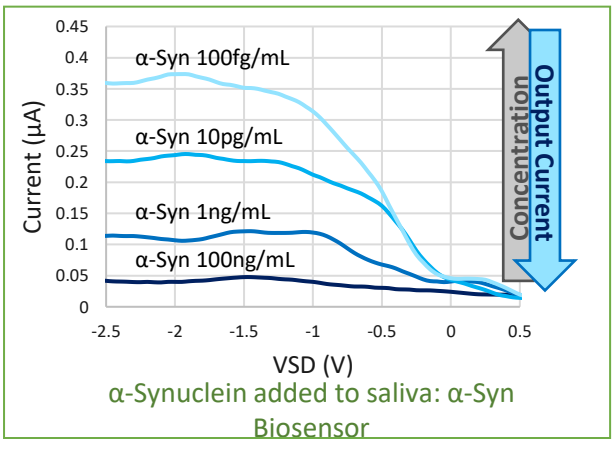
Details	1. Novel Design and Structure: optimal pairing of organic semiconductor with a self-assembled monolayer to increase charge mobility and provide normalized data between devices for each analyte. 2. Design and construction allows for selective binding and immobilization of biorecognition molecules (e.g., antibodies, aptamers, carrier proteins); and 3. Multi-channel device includes calibration well for each analyte to produce standardized curves and normalize data between multiple devices.
Potential Users	1. Primary healthcare providers: to provide holistic snapshot of the patient's homeostasis within minutes of sample collection. 2. Specialists— e.g., cardiologists, hepatologists, and oncologists: to supplement patient case histories for better illness management. 3. Long term care facilities: Improved patient monitoring and early identification of communicable diseases. Reduces the expense or time required for laboratory testing. 4. Isolated communities: More timely and accurate data for remote communities with limited resources for managing community health.
Patents	US provisional application in progress
Inventors	Professor Ravi Prakash, Roslyn Massey



α-Synuclein in distilled water: α-Syn Biosensor



α-Synuclein added to saliva: α-Syn Biosensor

Figure 2: Detection of α-synuclein protein in distilled water (left) and saliva solutions (right) at physiologically relevant concentrations (~ 100 pg/ml)

For more information about licensing and development opportunities, contact

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