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We are developing a Tunable Attribute Precision Screening-Rapid Pathogen Detection (**TAPS-RPD**) assessment platform. Our goal is to characterize a library of cell signatures exhibited in response to known pathogen colonization, toxins and stress to allow rapid detection of unknown and engineered pathogens.

## Current Team Expertise:

Applied Microbiology: Culturing methods, nutrient-dependent behavioral assays, microscopy, cell-cell signaling, community behavior.

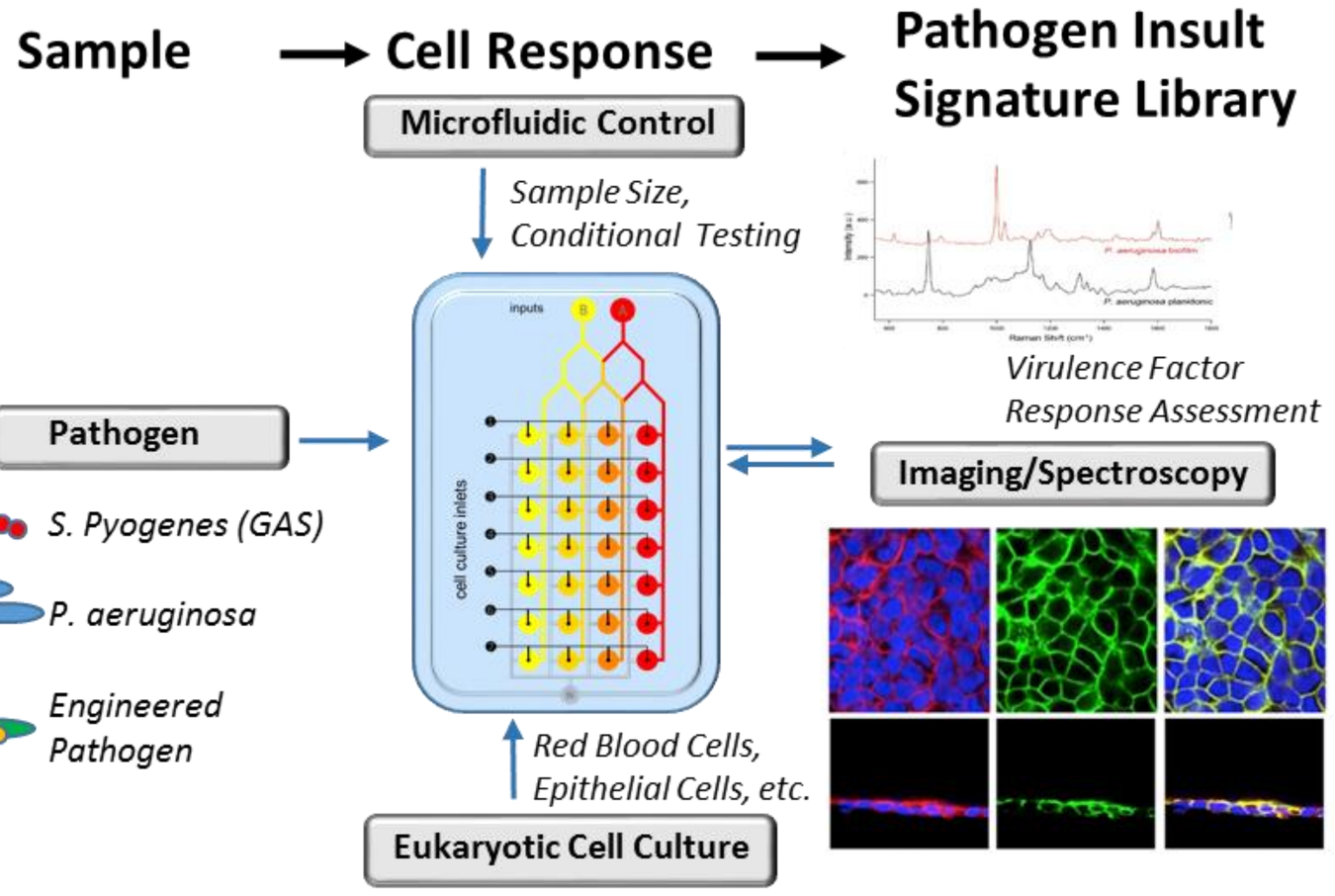
Molecular techniques: Analysis and design of nucleic acid and peptide signals and antimicrobials.

Host-pathogen response: multivariate and dynamic response, *in vitro* assay development.

Advanced imaging technology: visible live cell imaging, super-resolution microscopy, 3D absorption/scattering/fluorescence spectroscopy, Raman spectroscopy, lifetime imaging, light-scattering techniques, quantitative assessment of imaging data.

Microfluidics: microbial culturing, sample separation, analytical chemistry.


**Representative Host-pathogen response:** Group A *Streptococcus* streptolysin S (SLS)-mediated red blood cell lysis occurs through disruption of the major erythrocyte anion exchange protein, band 3, leading to $Cl^-$ ion influx. Higashi et al. *Nat Microbiol. (*2016) 1:15004.




We will use the host-pathogen signature library in development to **rapidly** screen **any** potentially harmful unknowns and engineered pathogens.

We are interested to develop **TAPS-RPD** as a robust engineered pathogen detection tool. Depending upon project direction, the following needs for partners have been identified:

- Viral pathogenesis
- Specific cell line expertise
- Analysis tools and strategies for chemical pattern data
- BSL3 and BSL4 validation opportunities

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