

Nucleus Developer Notes

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The colourimetric bacterial contamination sensing device.

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Abstract

This is a system-level plan for developing a colourimetric bacterial contamination sensing device.

Keywords Cytosol, Module

1. OVERVIEW

The London demo represents a biological device capable of detecting and reporting the presence of bacteria either in a biofilm or in solution. This provides a platform from which other sensing devices can be built to detect a variety of biological/chemical entities. As each module will be thoroughly characterised and fully interoperable, it can be easily leveraged by the wider synthetic cell community for other applications; communication with life is crucial to fields such as diagnostics and biological therapeutics. This will contribute to climbing the arc of the whitespace chart through enabling other researchers to easily build further complexity into our well-characterised system. The system will be primed for the addition of more reporter enzymes, extra biochemical sensing, and more sophisticated spatial printing of synthetic cells.

2. COMPONENT MODULES

- **Module 1:** AHL Bacterial Quorum Sensing.
- **Module 2:** LacZ/XylE Color Change Module. [\[link\]](#)
- **Module 3:** Quorum Sensing Polymersome. [\[link\]](#)
- **Module 4:** Spatial Patterning of DevCells. [\[link\]](#)
- **Module 5:** Hydrogel-Embedded GUV Developer Cells. [\[link\]](#)
- **Module 6:** Diffusion Kinetics. [\[link\]](#)

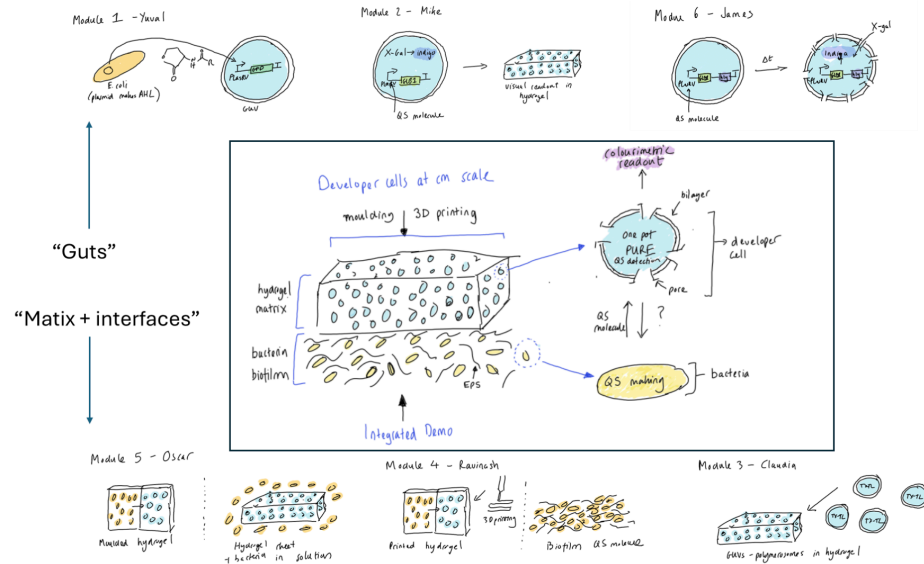


Figure 1. Modules and integration diagram for the proposed demonstration.