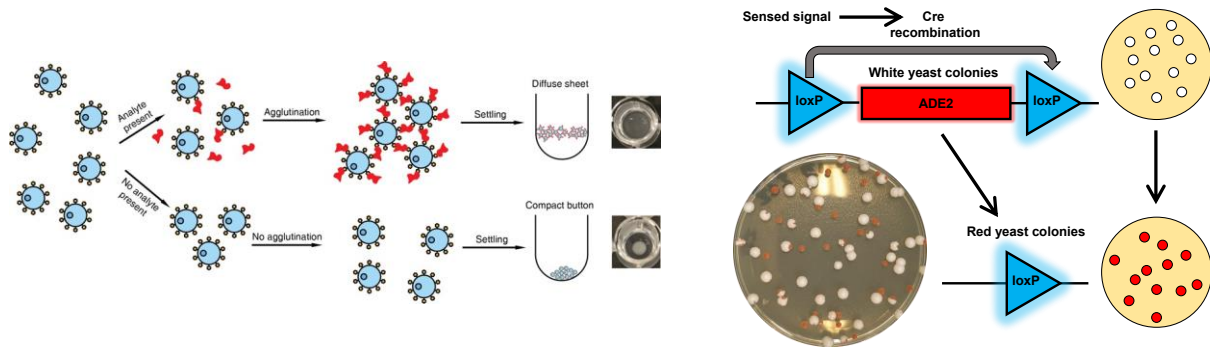


Microbes are cheap: Creating locally-grown solutions to global challenges

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Abstract: There are a number of barriers that prevent under-resourced communities from accessing technologies such as disease diagnosis and environmental monitoring: cost of reagents and equipment; availability of technical training; supply chain vulnerabilities; and the ability to maintain "cold chains" from production to the point of use. I will discuss efforts in our lab to use engineered microbes to create solutions designed to help lower these barriers, by enabling communities to grow batches of microbes where "the cell is the test" (the microbe is the key active ingredient). I will present recent and ongoing efforts on yeast-based assays with agglutination-based outputs, including a detector able to detect malaria antibodies in blood samples, as well as a yeast sensor that uses colony colour to report the conditions it encounters while passing through the gastrointestinal tract.



Bio: Prof. David McMillen is an associate professor in the Department of Chemistry and has cross-appointments in Cell and Systems Biology and Physics at the University of Toronto. Prof. McMillen received Ph.D. from University of Toronto as trained in an engineering science program, then joined Prof. James Collins' laboratory at Boston University for postdoctoral work just as the field of synthetic biology was being created. Prof. McMillen's group research is highly interdisciplinary and focus on applying engineering approaches (both experimental and modelling-based) to microbial systems, with the goal of systematically manipulating bacteria and yeast to produce robust, low-cost solutions to problems from environmental sensing to human health. Prof. McMillen is the director of the Synthetic Biology Innovation Cluster, which is an academic-industry-public sector network established in 2013, and an acting Director of The Impact Centre, University of Toronto. Prof. McMillen have received many prestigious awards and grants. Prof. McMillen is the recipient of three Grand Challenges Canada Rising Stars in Global Health grants based on developing microbial solutions to challenges in the developing world, and the lead PI on a Connaught Global Challenge Award: "Innovating for the Global South: Accelerating the Impact of Synthetic Biology on Health".

