Project Summary

- We have used the traditional engineering approach to build a stable and flexible molecular oscillator.
- Our original design relies on population dynamics and was inspired by the Lotka-Volterra predation model.
- Every step of the development cycle (Specifications, Design, Modelling, Implementation, Testing/Validation) has been fully documented on our OWW site.

Testing/Validation

- Definition of testing protocols to satisfy component specifications.
- Analysis of experimental data.
- Characterization of the different test constructs for extracting parameters.

Implementation

- Standard assembly using BioBricks.
- Successful building of oscillator components.
- Contributions to the Registry by adding tested, functional and intermediate parts.
- Quality control procedure.

Specifications

- Stable oscillations for more than 10 periods.
- High Signal to Noise Ratio.
- Controllable frequency and amplitude.
- Modular design for easy connectivity.
- Full documentation for quality control.

Achievements

- Derivation of the complete dynamical model, describing the main biochemical reactions driving our oscillator.
- Full theoretical analysis and detailed computer simulations, validating our design with regard to our specifications.
- Successful building and characterization of functional parts, providing the building blocks for the final oscillator.

Our Favourite Parts

- PoPs Blocker
  - Use of Cre-Recombinase.
  - PoPs control mechanism defining an irreversible switch.
- Prey Molecule Generator
  - Production of AHL via positive feedback loop.
- Predator Sensing
  - Characterization of a new AHL sensing part.

Team Members

Students
- Christin Sander
- Doopj Alpawi
- Farah Vohra
- Jiongjun Bai
- John By
- John Chattaway
- Jonathan Wells
- Tom Winson

Advisers
- Prof. Richard Kitney
- Prof. Paul Freemont
- Dr. David Mann
- Kirsten Jensen
- Vincent Rouilly
- Chueh-Loo Poh
- Matthieu Bultelle

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