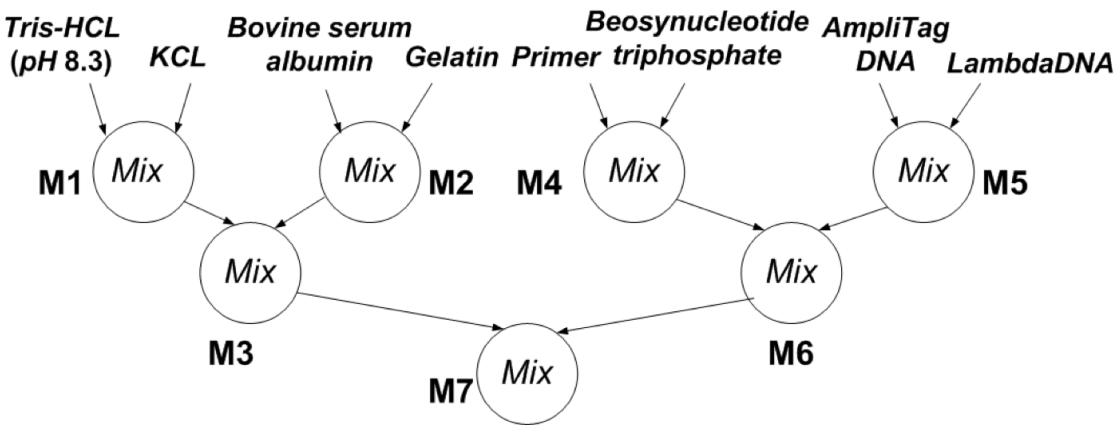
Benchmarks

The three benchmarks listed on this page are widely used to evaluation DMFB compilation and synthesis algorithms. To the best of our knowledge, this information was originally contained in a non-peer reviewed document written by Fei Su and Krishnendu Chakrabarty from Duke University, and hosted on Fei Su's webpage at Duke. The document has since disappeared, so we are re-disseminating the benchmarks here to better serve the research community.

These benchmarks are included with our source code download, along with several others.

PCR Mixing Tree

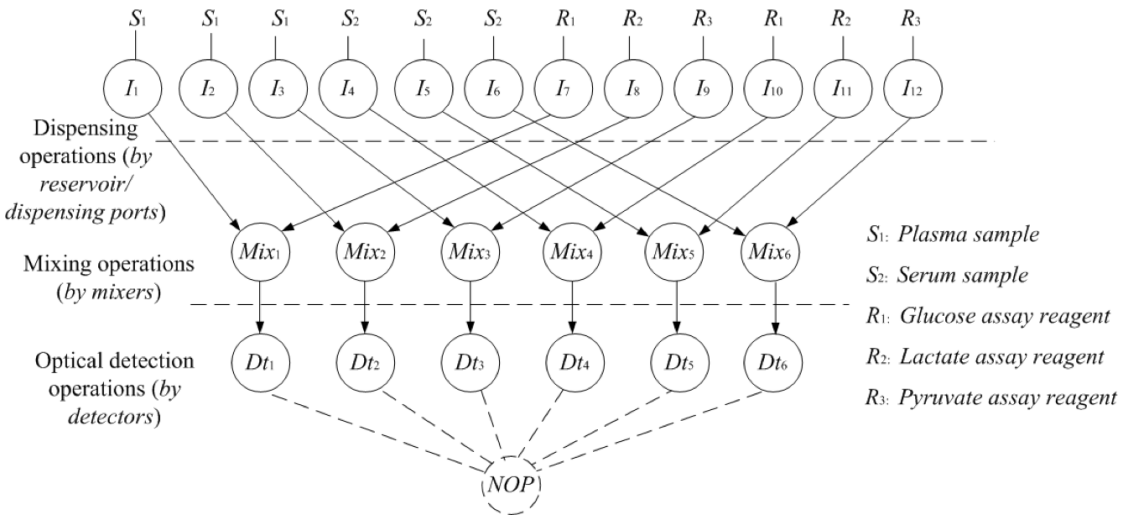


Module library:

Operation	Hardware*	Module	Mixing time
mixing	2x2 electrode array	4x4 cells	10s
	4-electrode linear array	3x6 cells	5s
	2x3 electrode array	4x5 cells	6s
	2x4 electrode array	4x6 cells	3s

*: Electrode pitch: 1.5 mm; Gap height: 600 μm

Multiplexed In Vitro Diagnostics Assay

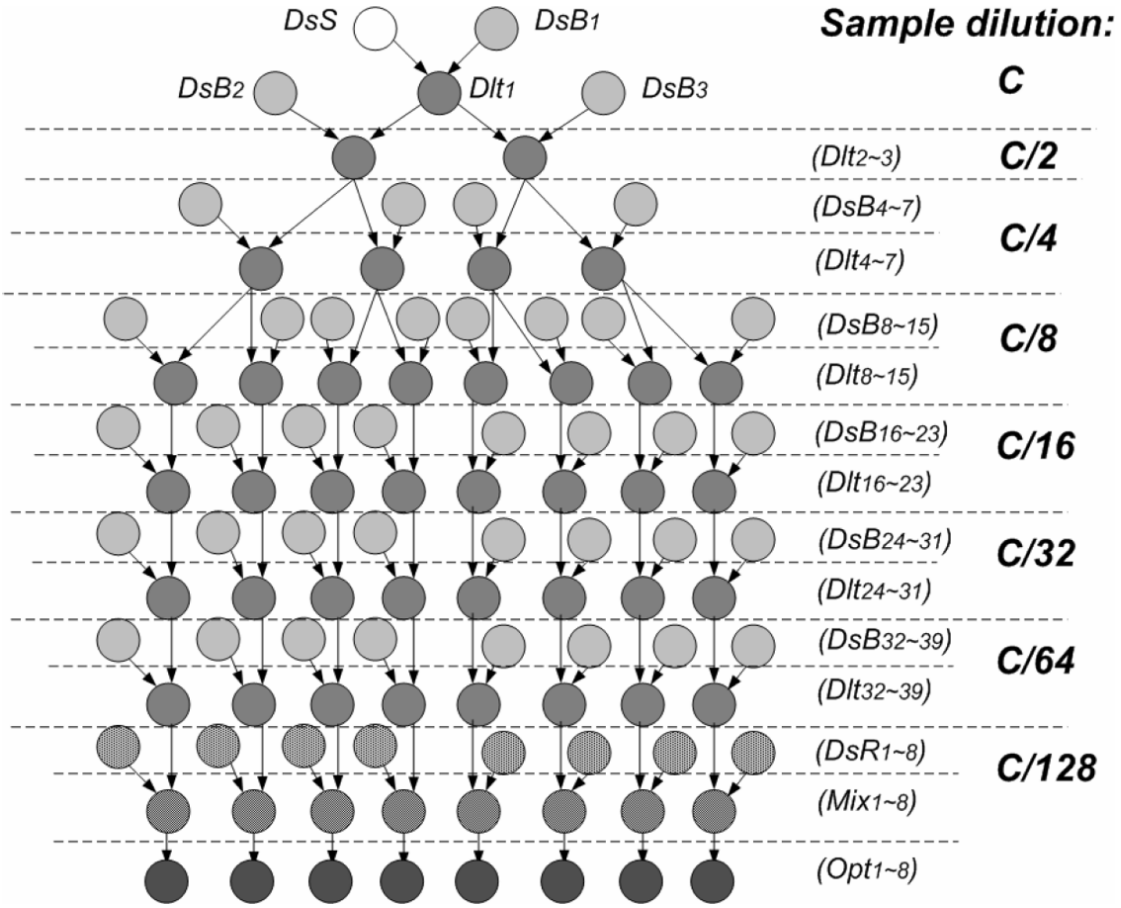


Module library:

Operation	Hardware*	Module	Mixing time
Mixing	2x4 electrode array mixer	4x6 cells	5s
Optical Detection	Optical detector for glucose detection	3x3 cells	10s
	Optical detector for lactate detection	3x3 cells	8s
	Optical detector for pyruvate detection	3x3 cells	13s
Storing	Storage unit	3x3 cells	N/A

*: Electrode pitch: 1.5 mm; Gap height: 600 μm

Protein Assay



Module library for synthesis.

Operation	Resource	Time (s)
DsS; *DsB*; *DsR*	On-chip reservoir/dispensing port	7
Dlt	2x2-array dilutor	12
	2x3-array dilutor	8
	2x4-array dilutor	5
	4-electrode linear array dilutor	7
Mix	2x2-array mixer	10
	2x3-array mixer	6
	2x4-array mixer	3
	4-electrode linear array mixer	5
Opt	LED+Photodiode	30
Storage	Single cell	N/A

Contact

Please direct any questions, comments, or other inquiries to the following e-mail address: microfluidics@cs.ucr.edu

Acknowledgment

This material is based upon work supported by the National Science Foundation under Grant Numbers 1035603, 1536026, and 1545097. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.