(Supporting Information)

Multiplexed and Reiterative Fluorescence Labeling via DNA Circuitry

Dzifa Duose,[†] Ryan M. Schweller,[†] Walter N. Hittelman,[§] and

Michael R. Diehl[†, ‡,*]

[*] Michael R. Diehl

Departments of Bioengineering[†] and Chemistry[‡], Rice University, 6100

Main Street, Houston, Texas 77005

Department of Experimental Therapeutics[§], M.D. Anderson Cancer Center[§],

Houston, Texas 77030

E-mail: diehl@rice.edu

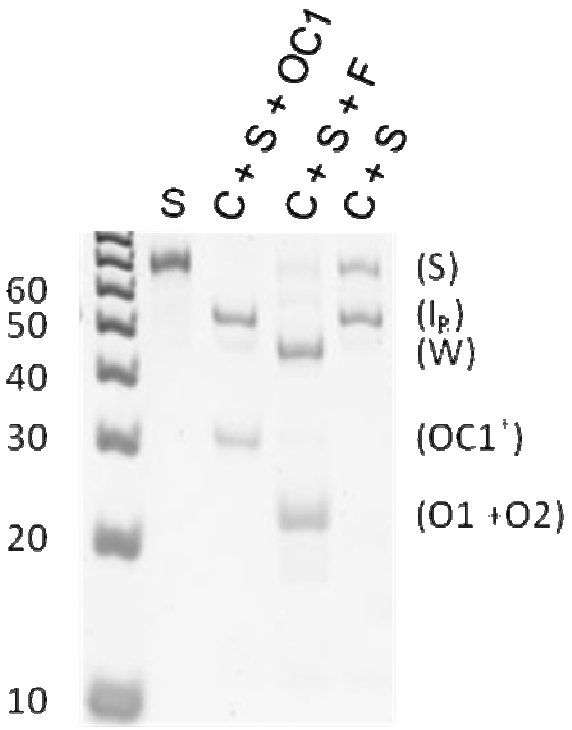

Figure S1. Complete native PAGE-gel illustrating the influence of the output sequestration reaction (O1 + OC1 → OC1*) on equilibrium distributions produced by partial circuit reactions. While efficient conversion of S to I_R requires output sequestration when S and C are present at similar concentrations, the I_R complex can be disassembled near quantitatively by simply adding a fuel strand to the reaction, without the use of output sequestration components.

Table S1. List of oligonucleotide sequences used in design of DNA-circuits. Underlined oligonucleotides denote toehold domains. All strands are listed in 5' to 3' direction. /3AmMC6/ denotes a 3' amino modifier on carbon 6; /5Cy5/ denotes 5' Cy5 fluorophore; /5Cy3/ denotes 5' Cy3 fluorophore and /3IAbRQSp/ denotes 3'Iowa black quencher.

Sequence Name	Nucleic Acid Sequence
Circuit1_O1	CCA CAT ACA TCA TAT TCC CTC ATT CAA TAC CCT ACG/3IAbRQSp/
Circuit1_O2	CTT TCC TAC A CC TAC GTC TCC AAC TAA CTT ACG G
Circuit1_LB	TGG AGA /iCy5/CGT AGG GTA TTG AAT GAG GGC CGT AAG TTA GTT GGA GAC GTA GG
Circuit1_C	CAT TCA ATA CCC TAC GTC TCC ATT TTT TTT TT /3AmMC6/
Circuit1_Fuel	CCT ACG TCT CCA ACT AAC TTA CGG CCC TCA TTC AAT ACC CTA CG/3IAbRQSp/
Circuit1_O1 comp	GTA TTG AAT GAG GGA ATA TGA TGT ATG TGG
Circuit1_O1short	CCA CAT ACA TCA TAT TCC CTC ATT
Circuit2_O1	ACC TCT TCA CGA ACA TTT CA/3IAbRQSp/
Circuit2_O2	ACC TAA TAG C AC CAC ATC AAT CTC GAT CCA GTA C
Circuit2_LB	TGG CTA /iCy3/TGA AAT GTT CGT GAA GAG GTG TAC TGG ATC GAG ATT GAT GTG GT
Circuit2_C	CTT CAC GAA CAT TTC ATA GCC ATT TTT TTT TT /3AmMC6/
Circuit2_Fuel	ACC ACA TCA ATC TCG ATC CAG TAC ACC TCT TCA CGA ACA TTT CA
Circuit2_O1comp	TGT TCG TGA AGA GGT
Circuit2_O1short	ACC TCT TCA
Circuit3_O1	TCA CAC ATC AAC CTC T TCTT T CTC TCG ACA CAT CAC
Circuit3_O2	CTT TCC TAC A CT TAT TCA TCC TTT CAC TCA CTT C
Circuit3_LB	GAA GTG AGT GAA AGG ATG AAT AAG AAG AGTG ATG TGT CGA GAG AAAG TAA
Circuit3_C	TCT CTC GAC ACA TCA C TTA CTT TT TTT TTT TT /3AmMC6/

Circuit3_Fuel	CT TAT TCA TCC TTT CAC TCA CTT CTCTT TCT CTC GAC ACA TCA C
Circuit3_O1comp	TGT CGA GAG AAA GAA GAG GTT GAT GTG TGA
Circuit3_O1short	TCA CAC ATC AAC CTC TTC TTT CTC
Circuit4_SB	CAC CAA CCC AAT TCT C CCTA C CCA TTC CTG TAT CAT
Circuit4_OB	ACC TAA TAG C TAC CTT CCC TCT ATT CAT GTC CAC
Circuit4_LB	GTG GAC ATG AAT AGA GGG AAG GTATAG GATG ATA CAG GAA TGG GTGG AGT
Circuit4_C	CCC ATT CCT GTA TCA T AC TCC A TT TTT TTT TT /3AmMC6/
Circuit4_Fuel	TAC CTT CCC TCT ATT CAT GTC CAC CCT ACC CAT TCC TGT ATC AT
Circuit4_O1comp	CAG GAA TGG GTA GGG AGA ATT GGG TTG GTG
Circuit4_O1short	CAC CAA CCC AAT TCT C CCTA C CCA
Circuit5_O1	CAT ACC ACA ACA ATT TAC TTC ACC AAC CCA TCC ACT
Circuit5_O2	CTT TCC TAC AAA TCG CCA AAC TAC AAA CTC AAT C
Circuit5_LB	GAG GTG AGT GGA TGG GTT GGT GAA GTG ATT GAG TTT GTA GTT TGG CGA TT
Circuit5_C	CAC CAA CCC ATC CAC TCA CCT C TT TTT TTT TT /3AmMC6/
Circuit5_Fuel	AAT CGC CAA ACT ACA AAC TCA ATC ACTT CAC CAA CCC ATC CAC T
Circuit5_O1comp	TGG GTT GGT GAA GTA AAT TGT TGT GGT ATG
Circuit5_O1short	CAT ACC ACA ACA ATT TAC TTC ACC
1compcy5	/5Cy5/TGT AGG AAA G
1compcy3	/5Cy3/GCT ATT AGG T