Supporting Information

Development of a microfluidic “click chip” incorporating an immobilized Cu(I) catalyst

Hairong Li, Joseph Whittenberg, Haiying Zhou, David Ranganathan, Amit V. Desai, Jan Koziol, Dexing Zeng, Paul J. A. Kenis and David E. Reichert

a Radiological Sciences Division, Mallinckrodt Institute of Radiology, Washington University School of Medicine, 510 South Kingshighway Blvd., St. Louis, MO 63110, USA.
b Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, 600 S. Mathews Ave., Urbana, IL 61801.
†these authors contributed equally

*Corresponding author:
Washington University School of Medicine,
510 S. Kingshighway Blvd., Campus Box 8225,
St Louis, MO 63110
Phone: 314-362-8461, Fax: 314-362-9940
e-mail: ReichertD@wustl.edu
Figure S1. HPLC analysis of “click” reaction between Flu568-azide and propargylamine for 30 min on a functionalized microchip.
Figure S2. HPLC analysis of “click” reaction between Flu568-acetylene and cyclo(RGDfK)-N$_3$ for 30 min: (A) on a functionalized microchip; (B) conventionally (cat. 60%).
Figure S3. Picture of a functionalized PDMS microchip: (left) microchip functionalized with water-soluble TBTA ligand 2; (right) a microchip functionalized with Cu(I)-ligand 2 complex.
Figure S4. XPS survey spectra and carbon narrow scan spectra (inset) of glass sample at each stage of functionalization: (black) non-functionalized glass; (red) glass+TMSPA; (blue) glass+TMSPA+ligand 2; (green) glass+TMSPA+ligand 2+Cu(I).
Figure S5. XPS survey spectra and carbon narrow scan spectra (inset) of PDMS sample at each stage of functionalization: (black) non-functionalized PDMS; (red) PDMS+TMSPA; (blue) PDMS+TMSPA+ligand 2; (green) PDMS+TMSPA+ligand 2+Cu(I).
Figure S6. XPS carbon narrow scan spectra of (A) glass and (B) PDMS for (black) non-functionalized samples; (red) samples functionalized with ligand 2 without prior functionalization with TMSPA; (blue) samples functionalized with ligand 2 with prior functionalization with TMSPA.
Figure S7. Copper narrow scan spectra for (A) glass and (B) PDMS substrate functionalized with TMSPA, ligand 2, and Cu(I).
Figure S8. “Click” reaction between Flu568-azide and propargylamine on a functionalized microchip for 15 min at 37 °C on different days (n=3-4).
Figure S9. Fabrication steps for making PDMS-glass microreactors: PDMS master was made by etching a silicon wafer with patterned photoresist by DRIE technique; the photoresist was removed and a PTFE-like layer (fluorocarbon) was applied to the etched silicon surface to prevent PDMS from adhering to the wafer; PDMS was poured onto the master and polymerized in an oven; interconnects were punched for inserting inlet and outlet tubing, and finally the PDMS imprint was bonded to glass.