XINGYU LIN

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Insitute of Microanalytical Systems

Department of Chemistry

Zhejiang University

Hangzhou 310058, China

Education

Ph.D. in Analytical Chemistry, Zhejiang University, China Sept. 2011 to June 2016

- Research Keywords: Nano/Microfluidics; Nanochannel; Electrochemistry; Biomimetic;

B.Sc. in Chemistry, Xiamen University, China Sept. 2007 to June 2011

- TOP 10% Recommended Exam-free Graduate to Zhejiang Univ. with full scholarship

Research Experience

Institute of Microanalytical Systems, Zhejiang Univ. Sept. 2011 to Now

Researcher, Advisor: Professor Bin Su / Hengwu Chen

- Topic 1: Fabrication of free-standing ultrathin silica membranes with highly ordered and perpendicular ultrasmall nanochannels (~ 2 nm) for precise and fast molecular separation. The nanochannels membrane could selectively transport molecules based on size, charge, structures and hydrophobicity with high flux, and can be further tuned by pH, ionic strength or surface modification. Study deeply in molecular/ionic transport through ultrasmall nanochannels and their application.
- Topic 2: Use of PDMS modified ultrashort and ultrasmall heterogeneous nanochannels for mimicking biological channels. These novel channels with a asymmetry hydrophobic/hydrophilic strucutre exhibit precise selectivity towards molecules with different hydrophobicity/charge/size, and can switch between “OFF” state and “ON” state in the presence of specific stimuli, such as voltage, pH or salt concentration without use of sophisticated polymers. These novel gating phenomena are resulted from the interplay between hydrophobic rejection on the top and electrostatic attraction on the bottom.
- Topic 3: Preparation of silica nanochannels membrane modified ITO electrodes for direct electrochemical detection of trace nitroaromatic pesticides in the complex real samples (milk) without sample pretreatment.
- Topic 4: Electrochemical detection of droplet-contained species in a microfluidic chip by phase conversion and their use for kinetics study of Glucose oxide enzymes reaction. Investigate deeply in multiphase fluid formation (droplet, side-by-side laminar, vertical laminar, etc.) and their electrochemical/fluorescence response in microchannels.

State Key lab of Analytical Chemistry, Xiamen Univ. Sept. 2010 to July 2011

Researcher, Advisor: Profesor Bo Zhang/Qiuquan Wang

- Topic 5: Fabrication of PDMS microfluidic chip with capillary electrophoresis and isoelectric focusing as a 2D separation platform for multicomponent proteins separation.

- Successfully used for Lysozyme, Myoglobin, Rnase, Cyt C, etc. separation.

Department of Chemicobiology, Xiamen Univ. Sept. 2009 to July 2010

Research Trainee, Advisor: Professor Chaoyong James Yang

- Topic 6: Single-molecule and single-cell emulsion using agarose droplet microfluidics

Technical Skills

- Preparation of electrode-supported or free-standing films with highly ordered and ultrasmall perpendicular nanochannels, and their integration with microfluidic chip.
- Nano/microfluidic chip (glass, silicon, PDMS, PMMA, PS, PC, etc) design, fabrication and application in analytical chemistry and biological application field. Microelectrode array fabrication by lithography (on glass) or chemical deposition (on polymer). Two-phase flow (droplet, side-by-side laminar flow, vertical laminar flow, etc.) formation in microchannels and their application.
- Regioselective surface modification of nano/microchannels through PDMS evaporation, UV, plasma, silanization or graft method.
- Electrochemistry in nanochannels and microchannels.
- Skilled in MEMS, electrochemical workstation, fluorescence microscope, laser-induced fluorescence systems, capillary electrophoresis, isoelectric focusing and UV-vis. Familiar with MS, HPLC, TEM, SEM, IR, and other analytical apparatuses.

Teaching Experience

- Teaching and Supervise one Ph.D. and two Masters doing research in Prof. Bin Su group, Zhejiang University, 2013 – 2016
- Teaching and Supervise one undergraduate student doing SRTP experiments "electrochemical detection of paraoxon using PDMS modified MSF-ITO", Zhejiang University. 2014 – 2016
- Teaching assistant of Analytical and Inorganic Chemistry, Department of Chemistry, Zhejiang University. 2014
- Teaching assistant of Basic Chemical Experiment, Zhejiang University. 2012

Research Contribution

(1) Publications:

[1] Xingyu Lin, Bowen Zhang, Qian Yang, Fei Yan and Bin Su*, Polydimethysiloxane Modified Silica Nanochannel Membrane for Hydrophobicity-Based Molecular Filtration and Detection, ***Anal. Chem.,*** 2016, 88(15): 7821-7827.

[2] Xingyu Lin, Qian Yang, Fei Yan, Bowen Zhang and Bin Su*, Gated Molecular Transport in Highly Ordered Heterogeneous Nanochannel Array Electrode, ***ACS Appl. Mater. Interf.,*** 2016, 8(48): 33343-33349.

[3] Xingyu Lin, Qian Yang, Longhua Ding and Bin Su*, "Ultrathin Silica Membranes with Highly Ordered and Perpendicular Nanochannels for Precise and Fast Molecular Separation", ***ACS Nano***, 2015, 9 (11), 11266.

[4] Xingyu Lin, Xianqiao Hu, Zeqing Bai, Qiaohong He, Hengwu Chen*, "A microfluidic chip capable of switching W/O droplets to vertical laminar flow for electrochemical detection of droplet contents", ***Anal. Chim. Acta,*** 2014, 828, 70.

[5] Lisiqi Xie, Xiao Huang, Xingyu Lin and Bin Su*, Nanoscopic Liquid/Liquid Interface Arrays Supported by Silica Isoporous Membranes: Trans-Membrane Resistance and Ion Transfer Reactions, ***J. Electroanal. Chem.***, 2017, 784: 62-68.

[6] Xiao Huang, Lisiqi Xie, Xingyu Lin and Bin Su*, Detection of metoprolol in human biofluids and pharmaceuticals via ion-transfer voltammetry at the nanoscopic liquid-liquid interface array, ***Anal. Chem.***, 2017, 89(1): 945-951.

[7] Qian Yang, Xingyu Lin and Bin Su*, Molecular Filtration by Ultrathin and Highly Porous Silica Nanochannel Membranes - Permeability and Selectivity, ***Anal. Chem.***, 2016, 88(20): 10252-10258.

[8] Yafeng Wang, Xingyu Lin and Bin Su*, Redox Cycling with ITO Electrodes Separated by an Ultrathin Silica Nanochannel Membrane, ***Electrochem. Commun.***, 2016, 72: 1-4.

[9] Xiao Huang, Lisiqi Xie, Xingyu Lin and Bin Su*, Permselective Ion Transport across the Nanoscopic Liquid/Liquid Interface Array, ***Anal. Chem.,*** 2016, 88(12): 6563-6569.

[10] Fei Yan, Xingyu Lin and Bin Su*, Vertically Ordered Silica Mesochannel Films: Electrochemistry and Analytical Applications, ***Analyst***, 2016, Accepted, DOI: 10.1039/C6AN00146G.

[11] Weiliang Guo, Xingyu Lin, Fei Yan and Bin Su*, "Vertically Ordered Silica Mesochannel Modified Bipolar Electrode for Electrochemiluminescence Imaging Analysis", ***ChemElectroChem***, 2016, 3(3), 480-486.

[12] Xianqiao Hu, Xingyu Lin, Qiaohong He, Hengwu Chen*, "Electrochemical Detection of Droplet Contents in Polystyrene Microfluidic Chip with Integrated Micro Film Electrodes", ***J. Electroanal. Chem***, 2014, 726, 7.

(2) Oral Presentation:

[13] Xingyu Lin, Qian Yang and Bin Su, "Nanofluidic Chips Containing Ultrathin Silica Membranes with Perpendicular Sub-3 nm Nanochannels for Molecular Separation", ***μTas 2015*** – *19th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Gyeongju, Korea, 2015.

(3) Poster Presentation

[14] Xingyu Lin and Bin Su, "A Microfluidic Device with Fluorescence Detection System Used for Permeation Study of Membrane", *11th National Conference on Luminescence Analysis*, Chongqing, China, 2015.

[15] Xingyu Lin and Bin Su,"Use a free-standing mesoporous membrane with highly ordered perpendicular channels as a nanosieve", *9th National Conference on Micro Total Analysis Systems*, Wuhan, China, 2014.

[16] Xingyu Lin and Hengwu Chen, "A Microfluidic Chip for Electrochemical Detection of Droplet-contained Species in Two-phase Flow and Its Application for Kinetic Study of Enzyme Reactions", ***APCE 2013*** – *13th Asia Pacific Symposium on Microscale Separations and Analysis*, Jeju, Korea, 2013.

[17] Xianqiao Hu, Xingyu Lin, Qiaohong He and Hengwu Chen, "Electrochemical Study of Droplet Contents in Polystyrene Microfluidic Chip", *5th International Symposium on Microchemistry and Microsystems*, Xiamen, China, 2013.

[18] Cuicui Ma, Xingyu Lin, Qiaohong He* and Hengwu Chen, "Fabrication of paper-based microfluidic devices by photoresist-free UV-lithography", *7th National Conference on Micro Total Analysis Systems*, Hangzhou, China, 2012.

(4) Patent:

[19] Number：201510579762.6 The Fabrication of Ultrathin Membranes with Highly Ordered and Perpendicular Nanochannels.

Skills

English ● TOEFL: 83 CET-4: 553 CET-6: 462 Fluent in speaking and writing

Computer ● Passed Computer Software Examination and NCRE. Obtained "Programmer" and "Second-Level of C" certificate. Capable of computer repairing and software programming. Proficient in windows OS and Office Suite. Experienced with application software such as Origin, Igor, CorelDraw, 3Dmax, Photoshop and Visual C.

Others ● 7-year driving experience with C1 driving license.

Awards

- Outstanding Ph.D. scholarship 2015
- Outstanding new Ph.D. scholarship 2014
- 1st grade scholarship for Graduate Students, Zhejiang Univ. 2011 to 2013
- "Outstanding League Cadres" (1%), "Outstanding Volunteer", Zhejiang Univ. 2012
- School-level 2nd prize scholarship, 3rd prize scholarship, Xiamen Univ. 2007-2011