

A microphysiometric system based on LAPS for real-time monitoring of microbial metabolism

Nan Jiang ^{1,2,3}, Tao Liang ⁴, Chunlian Qin ¹, Qunchen Yuan ¹, Mengxue Liu ¹, Liuqing Zhuang ^{1,2,3} and Ping Wang ^{1,2,3*}

- ¹ Biosensor National Special Laboratory, Key Laboratory for Biomedical Engineering of Education Ministry, Department of Biomedical Engineering, Zhejiang University, Hangzhou 310027, China; 21915031@zju.edu.cn (N.J.); lotusqin@zju.edu.cn (C.Q.); sumyuan@zju.edu.cn (Q.Y.); liumx15015@zju.edu.cn (M.L.); liujing123@zju.edu.cn (L.Z.)
 - ² The MOE Frontier Science Center for Brain Science & Brain-machine Integration, Zhejiang University, Hangzhou 310058, China
 - ³ State Key Laboratory of Transducer Technology, Chinese Academy of Sciences, Shanghai, 200050, China
 - ⁴ Research Center for Quantum Sensing, Zhejiang Lab, Hangzhou 310000, China; cooltao@zju.edu.cn
- * Correspondence: cnpwang@zju.edu.cn

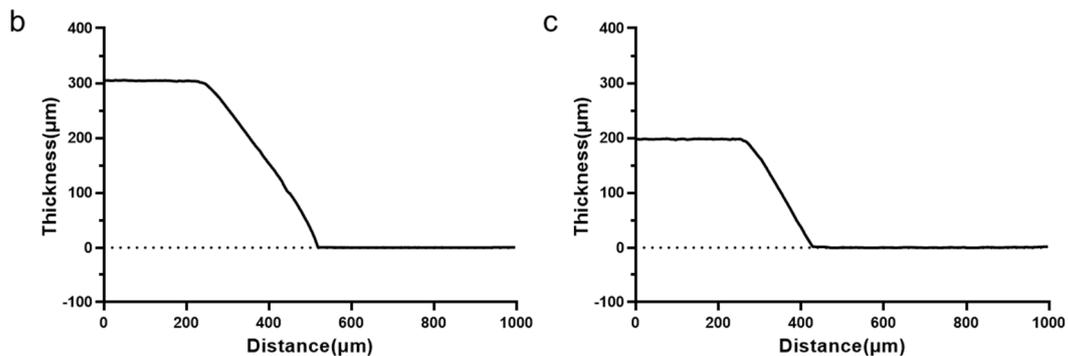
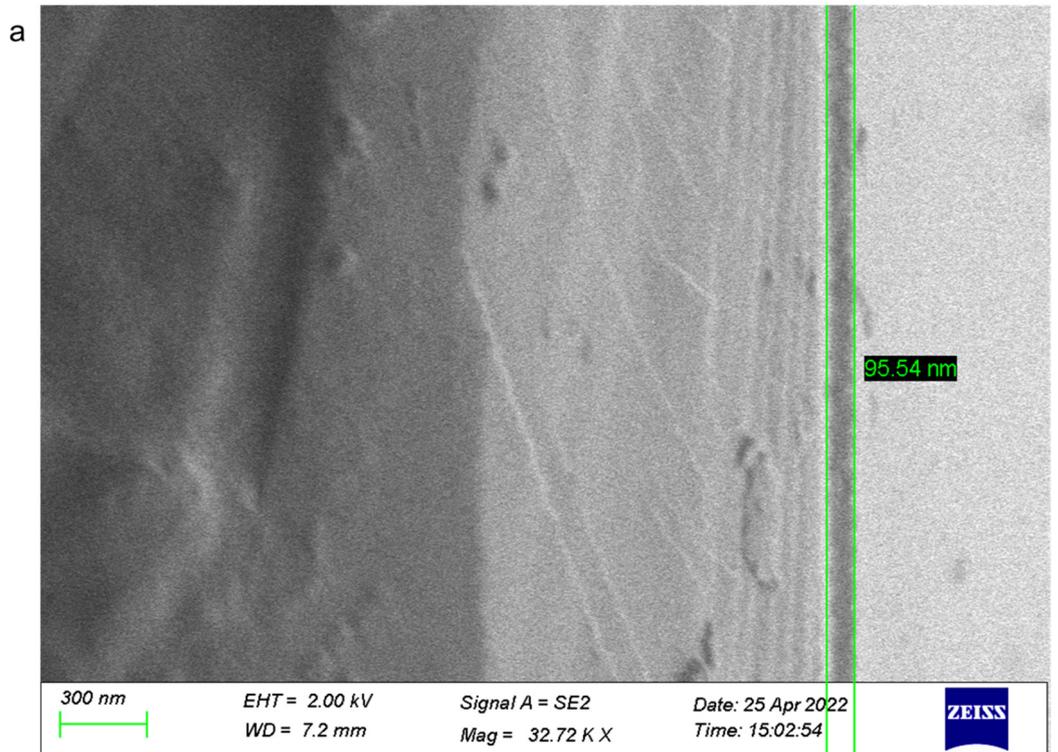


Figure S1. Verification of the thickness of the thinned LAPS chip. (a) SEM image of the Si_3N_4 and SiO_2 layer, the total thickness is ~ 100 nm. (b-c) The thickness of the thinned central part measured by surface profiler. (b) shows that the total thickness of the LAPS chip is ~ 300 μm while (c) shows that the depth of the central part is ~ 200 μm , so the thickness of the thinned central part of the Si substrate is ~ 100 μm .

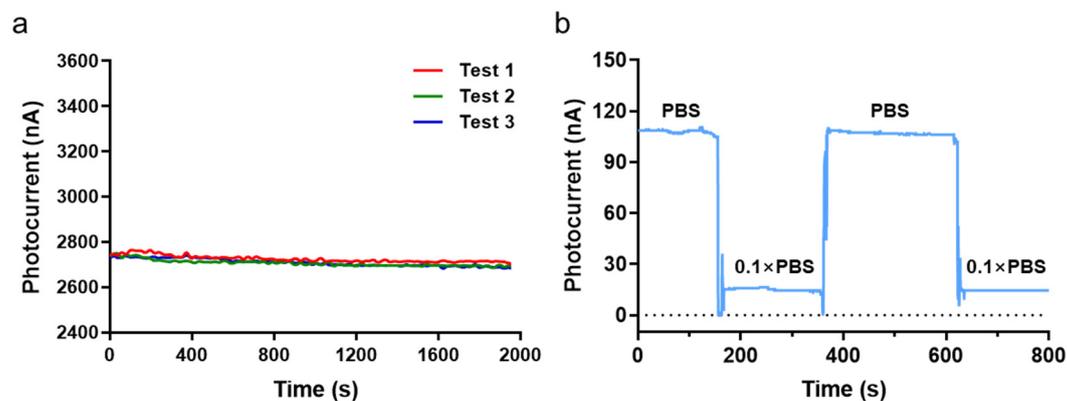


Figure S2. Verification of stability, repeatability and fluid exchange capability of the system. (a) Sensor stability and repeatability in constant voltage mode. (b) PBS and 10-fold diluted PBS were injected into the sensor chamber alternately. The photocurrent value was varied with change of the impedance of solution.

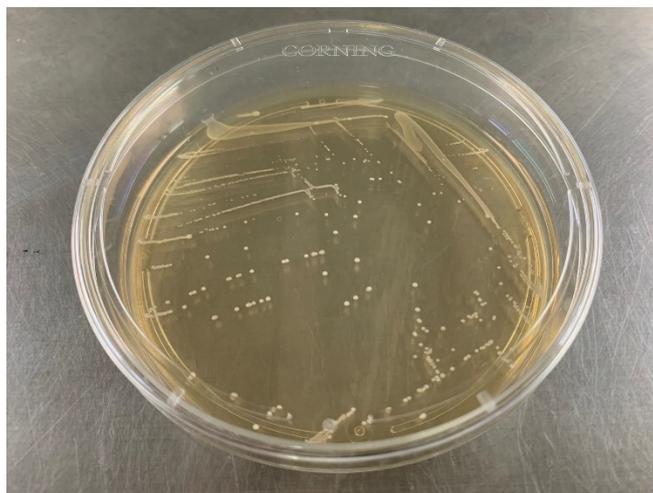


Figure S3. Verification of the activity of *Lactobacillus rhamnosus* after experiment. The growth state of *Lact. rhamnosus* on MRS agar plate after experiment.