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Electronic Supplementary Information

Title: Versatile biomimetic arrays assembly by phase modulation of coherent acoustic waves

*Xuejia Hu,[a, b] Jiaomeng Zhu,[a, b] Yunfeng Zuo,[a, b] Dongyong Yang,[c] Jianjian Zhang,[d] Yanxiang Cheng,[c] Yi Yanga,[a, b] **

a. School of Physics & Technology, Key Laboratory of Artificial Micro/Nano Structure of Ministry of Education, Wuhan University, Wuhan 430072, China.

b. Shenzhen Research Institute, Wuhan University, Shenzhen 518000, China. E-mail: yangyiys@whu.edu.cn

c. Department of Obstetrics and Gynecology, Renmin Hospital of Wuhan University, Wuhan University, Wuhan 430060, China.

d. Department of Neurosurg, Zhongnan Hospital of Wuhan University, Wuhan University, Wuhan 430071, China

This PDF file includes:

Figures S1 to S4

Other supplementary materials for this manuscript include the following:

Movies S1. The recorded dynamic ring pattern assembling process of the stained HUVECs.
Data file S1. The MATLAB code file of acoustic wavefield simulation.

Figures

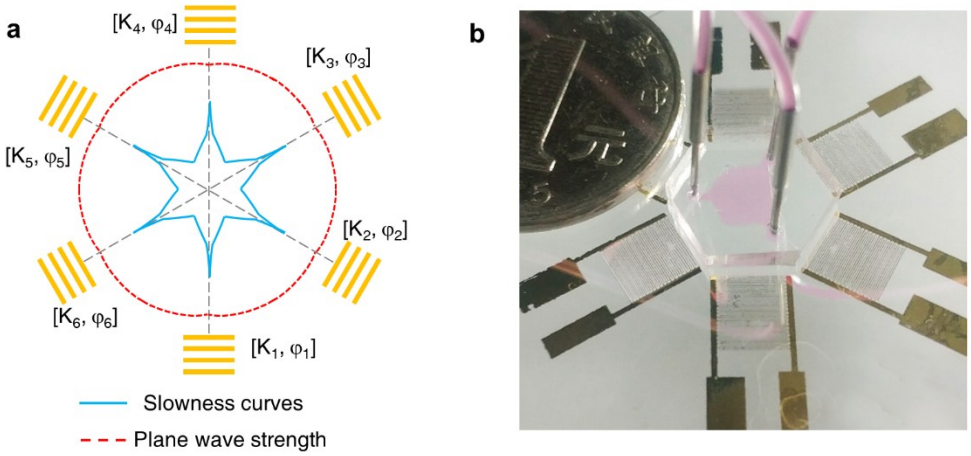

Fig. S1. Dependency of the anisotropic propagation (including slowness and plane wave strength of the vertical surface displacement) of surface acoustic waves on the on the (001) plane (Z-cut). Six IDTs are placed along the directions with the largest wave strength and denoted by wave number K_1 to K_6. (b) An image of the fabricated device.

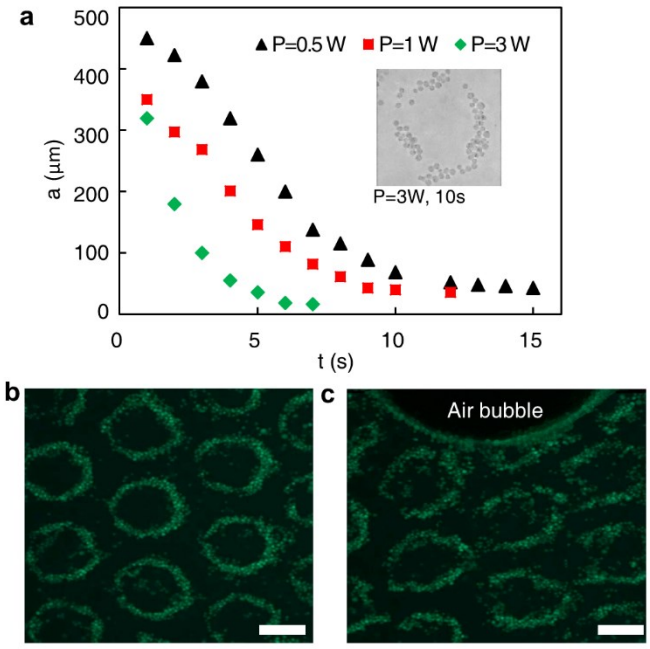

Fig. S2. (a) The average thickness of the patterned cell rings when different acoustic powers are applied. (b) The bubble in the chamber will cause the distortion of acoustic field patterns. The cells are arranged in regular rings before air cavity is generated. (c) When air bubble is generated in acoustic field, the scattering waves will superimpose with the original sound field, leading changes of the previous cell patterns. The scale bar is 300 μm.

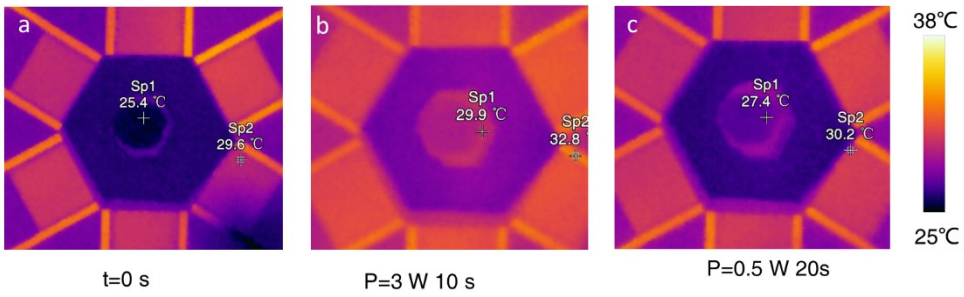

Fig. S3. Infrared thermal images of fluid in the chamber with different RF powers and times. (a) Before the RF power is applied, the temperature of the fluid is the same with the room temperature. The gold layer on the IDTs will reflect the infrared light, which will cause these region light intensity seems larger. The temperature of the fluid will slightly increase, when 3W RF power is applied for 10 s (b) and then 0.5 W RF power is applied for another 20 s (c).

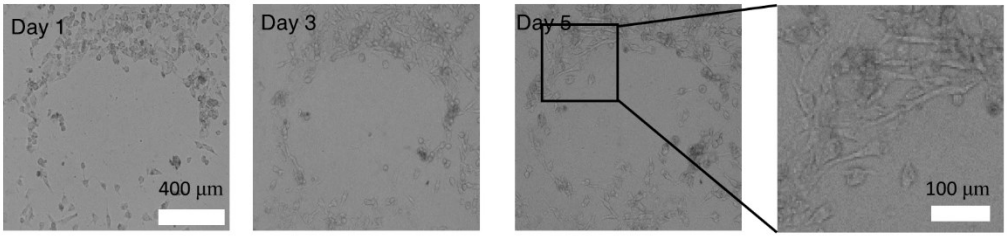

Fig. S4. Vascular formation process of a cell ring with diameter of 700 μm.