

Abstract Submitted
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Formation of Linear Gradient of Antibiotics on Microfluidic Chips for High-throughput Antibiotic Susceptibility Testing¹ SEUNGGYU KIM, SEOKHUN LEE, JESSIE S. JEON, KAIST — To determine the most effective antimicrobial treatments of infectious pathogen, high-throughput antibiotic susceptibility test (AST) is critically required. However, the conventional AST requires at least 16 hours to reach the minimum observable population. Therefore, we developed a microfluidic system that allows maintenance of linear antibiotic concentration and measurement of local bacterial density. Based on the Stokes-Einstein equation, the flow rate in the microchannel was optimized so that linearization was achieved within 10 minutes, taking into account the diffusion coefficient of each antibiotic in the agar gel. As a result, the minimum inhibitory concentration (MIC) of each antibiotic against *P. aeruginosa* could be immediately determined 6 hours after treatment of the linear antibiotic concentration. In conclusion, our system proved the efficacy of a high-throughput AST platform through MIC comparison with Clinical and Laboratory Standards Institute (CLSI) range of antibiotics.

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