

### Antimicrobial susceptibility testing against *E.coli* O157:H7 using microfluidic device

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Recent pandemic situation of COVID-19 has emphasized the need for rapid diagnostic assay tool. Moreover, in recent, it is strongly required to prevent an ineffective administration of antibiotics which accelerates the prevalence of antimicrobial resistant bacteria.

Microfluidic approach stands in important position as an analytical tool in biological area due to its ability of high throughput screening. Here, we present a microfluidic device to perform antimicrobial susceptibility testing(AST) against bacteria in a single device. By integrating flow-focusing channels in parallel as well as controlling the composition of antibiotic mixture, we could produce the cell-encapsulated droplets having linear concentration gradient. Using this strategy, we tested gentamicin against *E.coli* O157:H7 to determine the minimum inhibitory concentration(MIC). Screening the growth profile of cells in droplets having different concentration of gentamicin resulted in MIC determination in only 4-6 h using our device. This results show that our platform has the great potential to be used for AST with other pairs of bacteria (i.e. gram-positive bacteria) and antibiotics.