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Abstract for an Invited Paper
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Unraveling the genetic driving forces enabling antibiotic resistance at the single cell level.

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Bacteria are champions at finding ways to quickly respond and adapt to environments like the human gut, known as the epicentre of antibiotic resistance. How do they do it? Combining molecular biology tools to microfluidic and fluorescence microscopy technologies, we monitor the behavior of bacteria at the single cell level in the presence of non-toxic doses of antibiotics. By tracking the chromosome dynamics of *Escherichia coli* cells upon antibiotic treatment, we examine the changes in the number, localization and content of the chromosome copies within one cell compartment or between adjacent cells. I will discuss how our work pictures the bacterial genomic plasticity as a driving force in evolution and how it provides access to the mechanisms controlling the subtle balance between genetic diversity and stability in the development of antibiotic resistance.