

## Publication

### Antibiotic Tolerance and Persistence Studied Throughout Bacterial Growth Phases

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Antibiotic tolerance and persistence allow bacteria to survive lethal doses of antibiotic drugs in the absence of genetic resistance. Despite the urgent need to address these phenomena as a cause of clinical antibiotic treatment failure, studies on antibiotic tolerance and persistence are notorious for contradictory and inconsistent findings. Many of these problems are likely caused by differences in the methodology used to study antibiotic tolerance and persistence in the laboratory. Standardized experimental procedures would therefore greatly promote research in this field by facilitating the integrated analysis of results obtained by different research groups. Here, we present a robust and adaptable methodology to study antibiotic tolerance/persistence in broth cultures of Escherichia coli and Pseudomonas aeruginosa. The hallmark of this methodology is that the formation and disappearance of antibiotic-tolerant cells is recorded throughout all bacterial growth phases from lag after inoculation over exponential growth into early and then late stationary phase. In addition, all relevant experimental conditions are rigorously controlled to obtain highly reproducible results. We anticipate that this methodology will promote research on antibiotic tolerance and persistence by enabling a deeper view at the growth-dependent dynamics of this phenomenon and by contributing to the standardization or at least comparability of experimental procedures used in the field.

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