ID der Kurzfassung : **324**

Phenotypic resistant single-cell characteristics under recurring ampicillin antibiotic exposure in Escherichia coli

Inhalt

Non-heritable phenotypic drug resistance toward antibiotics challenges antibiotic therapies, and phenotypic resistance fosters the evolution of heritable resistance. Here, we describe single-cell characteristics of phenotypic resistant E. coli cells and compare those to characteristics of susceptible cells by exposure to different levels of recurrent ampicillin antibiotic. Contrasting expectations, we did not find commonly described growth arrest of cells. We find that under ampicillin exposure, phenotypic resistant cells reduced their growth rate by about 50% compared to growth rates prior to antibiotic exposure. The growth reduction is a delayed alteration to antibiotic exposure, suggesting an induced response and not a predetermined state as frequently described. Phenotypic resistant cells exhibiting constant slowed growth survived best under ampicillin exposure and, contrary to expectations, not only fast-growing cells suffered high mortality triggered by ampicillin but also growth-arrested cells. Our findings support diverse modes of phenotypic resistance, and we revealed resistant cell characteristics that have been associated with enhanced genetically fixed resistance evolution, which supports claims of an underappreciated role of phenotypic resistant cells toward genetic resistance evolution. A better understanding of phenotypic resistance will benefit combatting genetic resistance by developing and engulfing effective anti-phenotypic resistance strategies.

Keywords

Non-genetic antibiotic resistance, resistance evolution, single-cell, bacteria

Registration ID

OHS25-165

Professional Status of the Speaker

Senior Scientist

Junior Scientist Status

No, I am not a Junior Scientist.

Track Klassifizierung: AMR

Typ des Beitrags: Oral presentation