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How nutrients shape antibiotic sensitivity of *Pseudomonas aeruginosa*: food for thought

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Stellingen

Behorende bij het proefschrift

How nutrients shape antibiotic sensitivity in *Pseudomonas aeruginosa*

- 1 Antibiotic sensitivity in *P. aeruginosa* is affected by individual nutrient changes in the growth environment.
– *This thesis*
- 2 Nutrient-induced changes in antibiotic pharmacodynamics occur within the first few hours of exposure, well before nutrient depletion or slowed bacterial growth can explain these effects.
– *This thesis*
- 3 The integration of metabolomics and next-generation sequencing into experimental evolution studies performed under physiologically relevant conditions offers a powerful approach to further uncover the role of microbial metabolism in antimicrobial resistance.
– *This thesis*
- 4 The use of standardized culture conditions in patient care contributes to the mismatch between antibiotic susceptibility testing and clinical outcomes.
– *This thesis*
- 5 The role of antibiotic-tolerant bacterial subpopulations in treatment failure remains unresolved as long as the drivers of different bacterial responses to antibiotic treatment are not understood.
- 6 While the concept of heterogeneity in *P. aeruginosa* respiratory tract infections is widely acknowledged, the multiple layers of this heterogeneity are rarely considered in practice.
– *Adapted from La Rosa et al. Metabolites. 2019, 9(10), 234*
- 7 *In vitro* studies on metabolic modulation to enhance antibiotic sensitivity must account for infection-specific cell physiology.
– *Adapted from S. Meylan et al. Cell 2018, 172(6), 1228-1238*
- 8 Current insight into how the infectious microenvironment shapes antibiotic effects is limited, underscoring the need for fundamental research.
– *Adapted from T. Bjarnsholt et al. Lancet Infect. Dis. 2022, 22(3), e88-e92*
- 9 Strive to understand why someone believes, not just what they believe, and you will locate the real point of discussion.
- 10 Humor is the CTRL + ALT + DEL of the mind.

Maik Kok
Leiden, 20 januari 2026