

Investigation of mixture toxicity of widely used drugs caffeine and ampicillin in the presence of an ACE inhibitor on bacterial growth using droplet-based microfluidic technique.

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Abstract

Droplet-based microfluidic technique is very suitable for a variety of screening processes. The cultivation within nanoliter segments and multidimensional microtoxicological screening of the Gram-negative bacterium *Escherichia coli* were studied under droplet-based microfluidic conditions. In order to evaluate the toxicity of the binary and ternary mixtures of antibiotic ampicillin and caffeine in the presence of the angiotensin-converting enzyme inhibitor captopril, a time-resolved optical double endpoint detection unit was applied. It included a microflow-through fluorimeter and photometer, which can simultaneously analyze changes in the endogenous autofluorescence signal and the cell density of *E. coli* cultivated inside 450-nl microfluid segments. As a result, strong nonlinear combination effects and a concentration-dependent antagonistic effect, as well as formation of activity summits on bolographic maps, were found. Our findings confirm the importance of multiparameter investigations for toxicological studies and could be taken into account in medical practice.

Beteiligte Forschungseinheiten

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Identifizier

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