

Rapid test detects mobile resistance gene *mcr-1*

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Scientists from the German Center for Infection Research (DZIF) and the Justus Liebig University Giessen (JLU) have evaluated a rapid test that detects the dreaded colistin resistance gene within twenty minutes. It can therefore be used in hospitals and for livestock.

Colistin is used as the "last-resort antibiotic" for dreaded multidrug-resistant pathogens, especially in hospitals. However, gut bacteria that have become insensitive to colistin now exist—owing to the mobile resistance gene *mcr-1*. In early 2016, bacteria carrying this resistance gene were detected in Germany for the first time. Since then, there has been growing concern that it may develop into a "superbug" against which even emergency antibiotics are no longer effective. The risk of a further spread of this colistin resistance is high because it takes place through so-called mobile genetic elements (plasmids) which are transferred between different types of bacteria relatively easily.

"Confirming the mobile *mcr-1* [resistance gene](#) as rapidly as possible is important, so as to prevent its further spread," emphasizes Linda Falgenhauer, DZIF scientist at the Justus Liebig University Giessen and one of the first authors of this study. Together with her colleagues from Giessen University and scientists from the research association RESET, she tested a rapid genotypic resistance test for colistin that is already commercially available. "This is the only way with which mobile resistance can be differentiated from common resistance, because phenotypically they are the same," explains Can Imirzalioglu, who is also first author of the study and DZIF scientist at the Giessen University.

Getting results rapidly

For the evaluation of this [rapid test](#), the scientists worked together with the company AmplexBiosystems GmbH which provided the testing kits free of charge. 104 bacterial isolates from animals, humans and the environment underwent testing with the molecular rapid test: the rapid test results were compared to those from complete genome sequencing or PCR, and demonstrated one hundred percent sensitivity and specificity.

The test could clearly differentiate between common colistin resistance and mobile resistance located on plasmids. "The test results become available in only twenty minutes," explains Judith Schmiedel from the Giessen Team. "With the conventional procedure, it takes several hours to get results. Additionally, the system is very uncomplicated, so it should be developed further for future use in hospitals as well as for livestock farming and food production." However, the rapid test is still limited because applying it directly to samples has not yet been evaluated. Up to now, the test has been only applied to bacterial cultures, but the scientists are certain that it is only a matter of time before it is developed further.

More information: Can Imirzalioglu et al, Evaluation of a LAMP-based assay for the rapid detection of plasmid-encoded colistin resistance gene in isolates, *Antimicrobial Agents and Chemotherapy* (2017). [DOI: 10.1128/AAC.02326-16](https://doi.org/10.1128/AAC.02326-16)

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