

Evaluation of a rapid immunochromatographic assay for the detection of *mcr*-mediated colistin resistance in Gram-negative bacilli

Marie-Claire Milloux¹, Maxime Bouvier¹, NARA Network², Patrice Nordmann^{1,2}

¹ Medical and Molecular Microbiology, Department of Medicine, University of Fribourg, Fribourg

² National Reference Center for Emerging Antibiotic Resistance, University of Fribourg, Fribourg



BACKGROUND

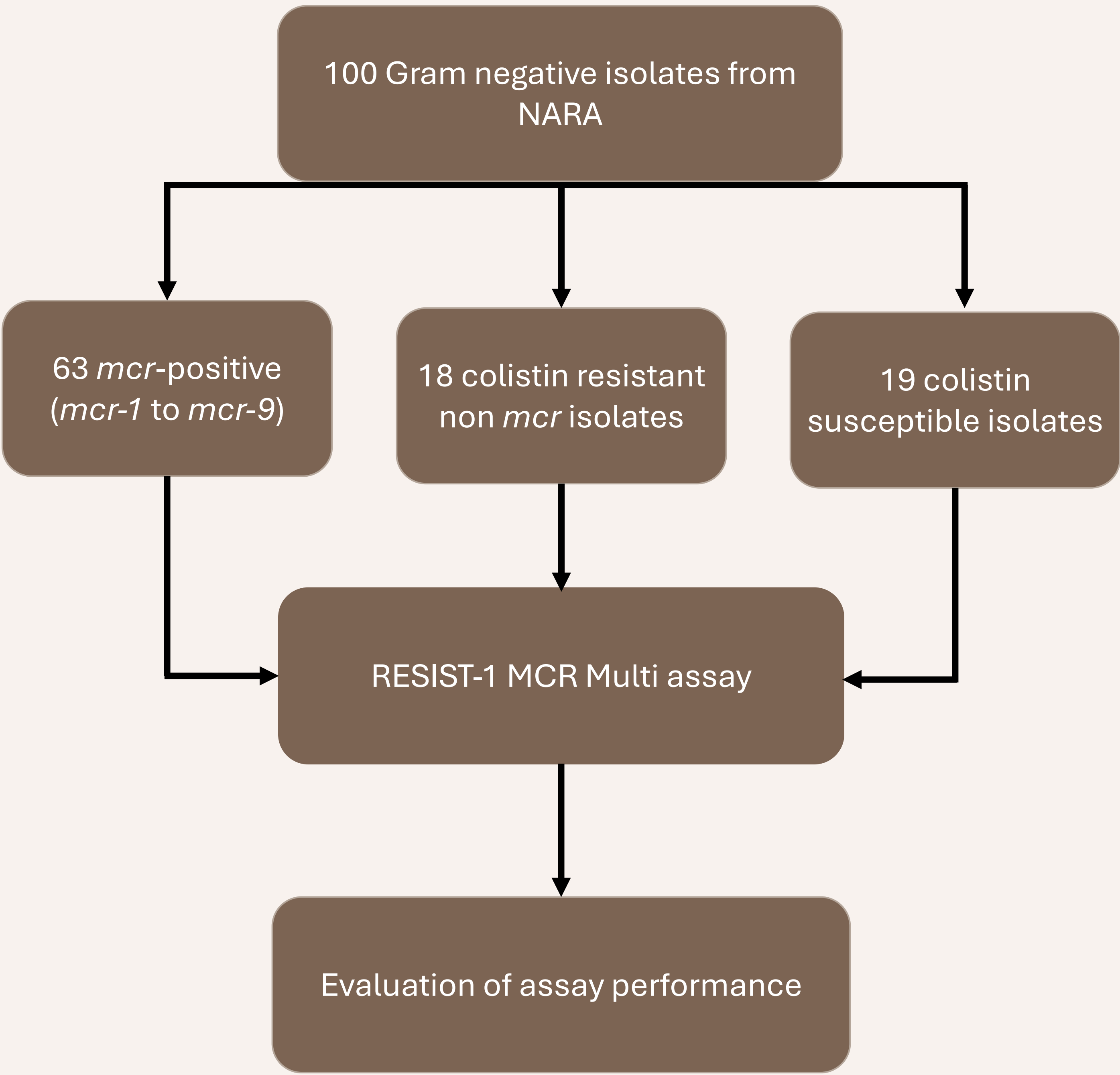
Colistin remains one of the last therapeutic options for the treatment of severe infections caused by **MDR Gram-negative bacteria**. The emergence of plasmid-mediated colistin resistance, mainly driven by *mcr* genes, represents a major public health concern because of its potential for rapid horizontal dissemination. To date, ten *mcr* families (*mcr-1* to *mcr-10*) have been described, with *mcr*-mediated resistance being particularly widespread in Asia, especially in China and India, in both human and animal isolates. Rapid detection of these resistance mechanisms is essential to optimize antimicrobial therapy and limit their spread.

This study aimed to evaluate the performance of the **RESIST-1 MCR Multi** immunochromatographic assay (Coris BioConcept) for the detection of the main *mcr* variants.

MATERIALS AND METHODS

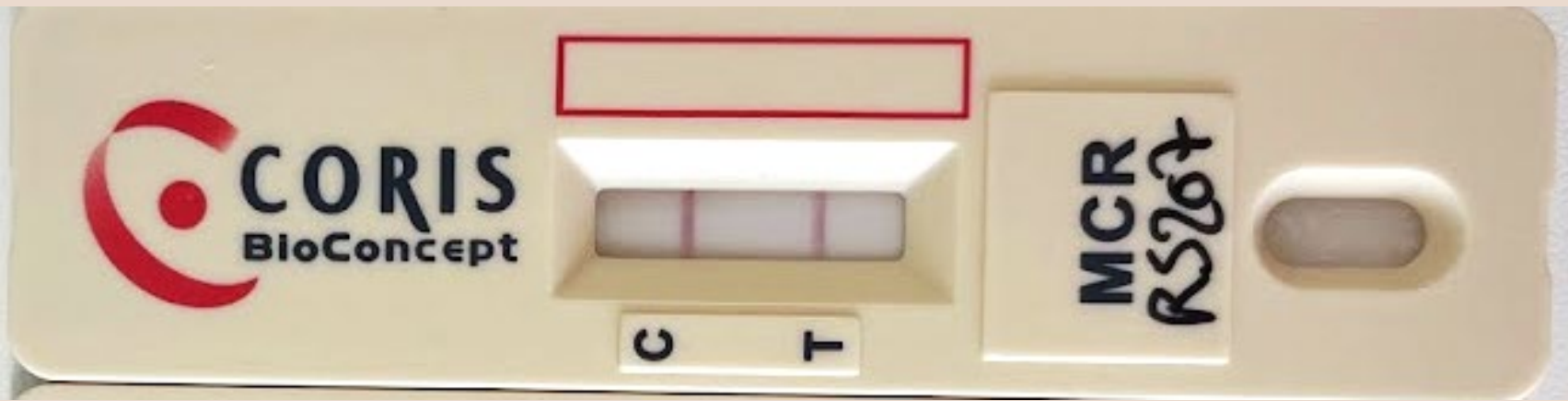
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Workflow



RESULTS

1 Representative results obtained for an *mcr-1* expressing strain



2 Sensitivity of the RESIST-1 MCR assay for the detection of different *mcr* variants in NARA strains

<i>mcr</i> variants	number	sensitivity (%)
<i>mcr-1</i>	33	100
<i>mcr-2</i>	1	100
<i>mcr-3</i>	4	0
<i>mcr-4</i>	4	0
<i>mcr-5</i>	4	0
<i>mcr-6</i>	1	100
<i>mcr-7</i>	1	0
<i>mcr-8</i>	1	0
<i>mcr-9</i>	13	0
<i>mcr-1</i> and <i>mcr-5</i>	1	100

3 Specificity of the RESIST-1 MCR assay using colistin-susceptible and colistin-resistant non-*mcr* control strains

strains	number	specificity (%)
colistin susceptible isolates	19	100
colistin resistant non <i>mcr</i> isolates	18	100

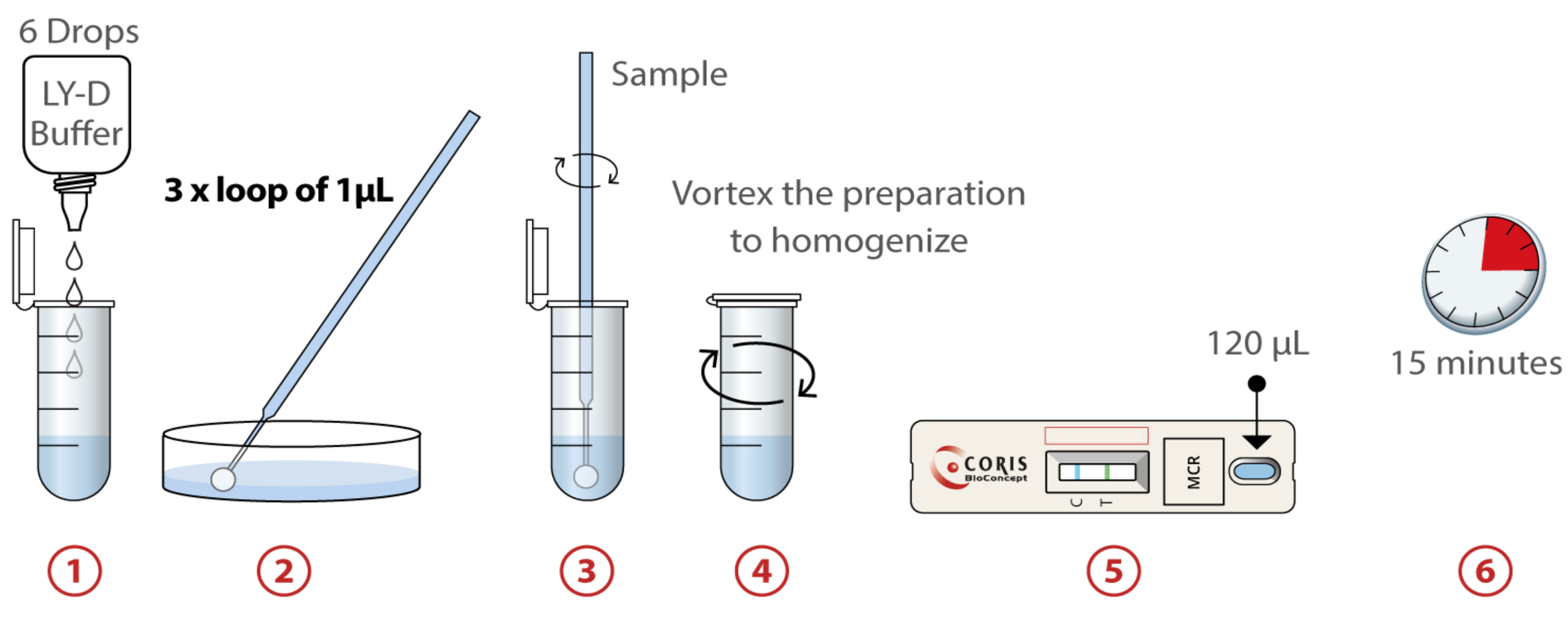
The rapid test was evaluated on a panel of different Gram-negative bacterial species, including: *Acinetobacter baumannii* (n = 3), *Citrobacter freundii* (n = 1), *Citrobacter amalonaticus* (n = 1), *Citrobacter farmeri* (n = 1), *Enterobacter absuriae* (n = 1), *Enterobacter cloacae* (n = 10), *Enterobacter sakazakii* (n = 1), *Escherichia coli* (n = 44), *Klebsiella pneumoniae* (n = 25), *Pseudomonas aeruginosa* (n = 4), and *Salmonella enterica* (n = 7).

Sensitivity = 100%

(for *mcr-1*, *mcr-2* and *mcr-6* expressing isolates)

Specificity = 100%

2 Procedure of the RESIST-1 MCR Multi (Coris BioConcept)



CONCLUSION

- **Rapid** (<15 min) and **easy-to-use** lateral flow assay.
- Excellent performance for *mcr-1*, *mcr-2* and *mcr-6*.
- **High specificity with no false-positive results.**
- Does not detect non-*mcr*-mediated colistin resistance.
- Additional methods remain necessary when other resistance mechanisms are suspected.



Acknowledgements
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