

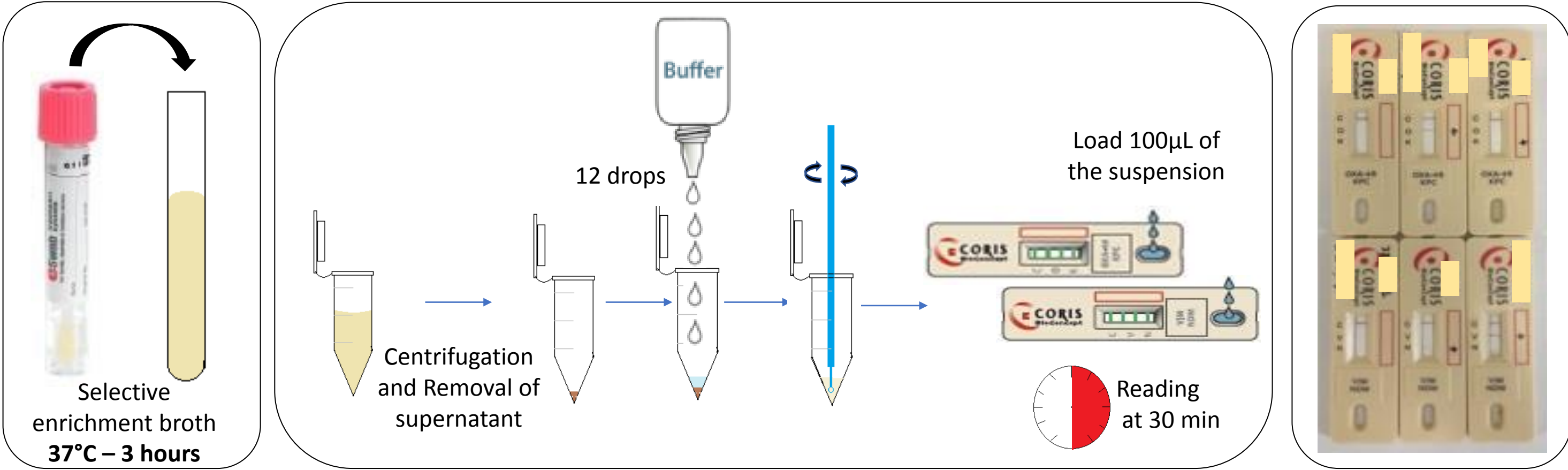
Introduction and purpose

Rapid detection of patients colonized with Carbapenemase-Producing Enterobacteriaceae (CPE) is fundamental for the control of their diffusion and limitation of the use of carbapenems. According to the latest epidemiological report, the main carbapenemases observed in France are OXA-48 and its variants followed by NDM and rarely VIM and KPC.

We have improved a method allowing early detection and identification of principal carbapenemase types directly on rectal eSwabs™, using O.K.N.V. K-SeT® (Coris Bioconcept).

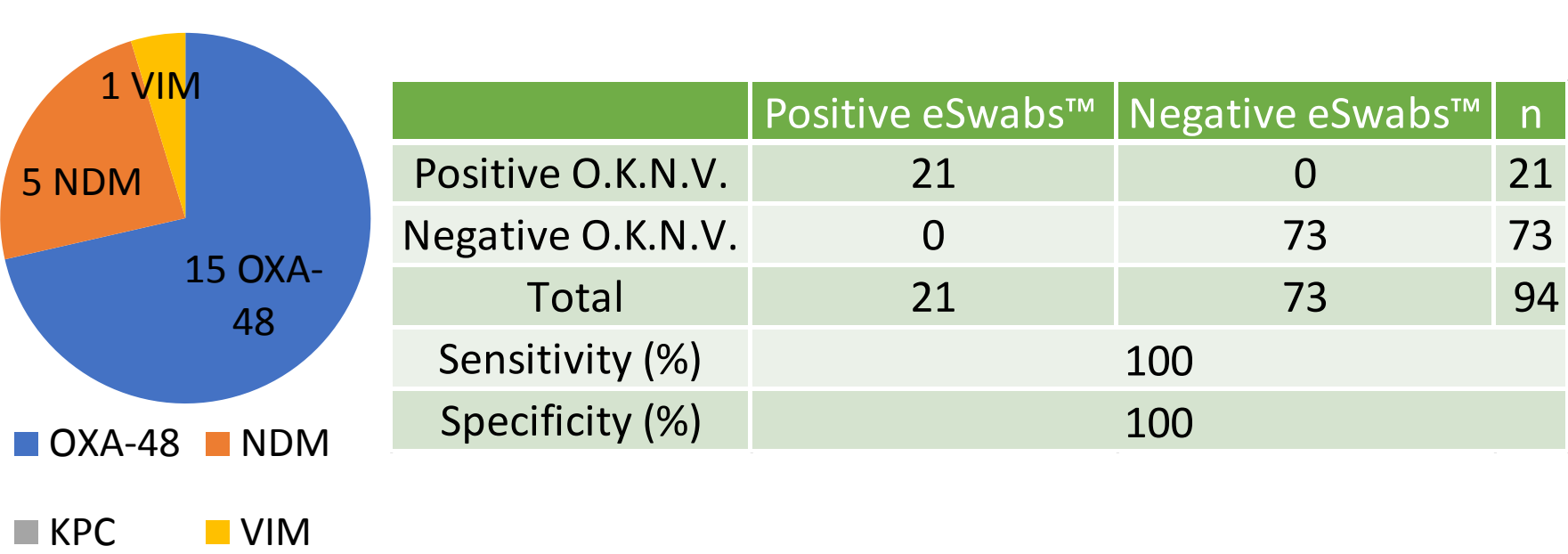
Methods

- Development step : eSwabs™ were spiked with CPE-negative stools and different concentration (10³, 10⁴, 10⁵, 10⁶ and 10⁷ CFU/mL) of 47 CPE strains (19 OXA-48, 10 NDM, 14 KPC, 3 VIM and 1 OXA-48 and NDM strain).
 - Patient eSwabs™ : Between 2017 and 2018, we have collected 94 rectal eSwabs™ (stored at -20°C) from patients in 3 hospitals. Among them, 21 were found positive for carbapenemase production by standard culture and confirmed by molecular typing (including 19 CPE, 1 NDM-producing *A. baumannii* strain and 1 VIM-producing *P. aeruginosa* strain).
- After selective broth enrichment at 37°C for 3 hours, the protein extraction method of Coris Bioconcept is applied to the centrifugation pellet. Extract is tested with O.K.N.V K-SeT® kit according to the manufacturer’s instructions. However, test result is read at 30 minutes.
- Quantification of the CPE before and after selective enrichment is carried out on agar plates ChromID® CARBA SMART (bio-Mérieux).



Results

- Development step : Average yield of preanalytical enrichment of CPE is around 200 times. The detection limit (DL) is ≈ 10⁴ CFU/mL whatever the carbapenemase types.
- Patient eSwabs™ : After selective enrichment, sensitivity and specificity were 100% and 100%, respectively.
- Of note, 1 NDM-producing *A. baumannii* strain and 1 VIM-producing *P. aeruginosa* strain were detected.



Conclusion

Our new method of selective enrichment during 3 hours allow direct identification of low CPE carriage from rectal eSwab™ using O.K.N.V. K-SeT®.

References

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