

## INTRODUCTION

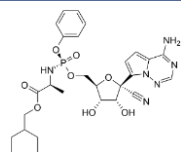
The quality and the safety of sterile preparations in hospital centers are essential to ensure patient safety. The development of rapid and efficient analytical methods is required to control final product before use. Remdesivir was one of the major treatment during the SARS-COV2 pandemic.

➔ **Comparison of two analytical methods : Flow injection analysis coupled with UV detection (FIA-UV) and Raman spectroscopy (RS) to quantify Remdesivir in infusion bag.**

## MATERIALS AND METHOD

Sample preparation

- ❖ Remdesivir powder (Veklury®) from Gilead (France)
- ❖ Concentration range from 0.25 to 1.625 mg.mL<sup>-1</sup>
- ❖ Therapeutic concentrations 0.4 and 0.8 mg.mL<sup>-1</sup>
- ❖ Reconstitution in EPPI, then, dilution in NaCl 0.9%
- ❖ 3 data set : calibration set (n = 45), validation set (n = 27) and real life sample (n = 58)



Data acquisition

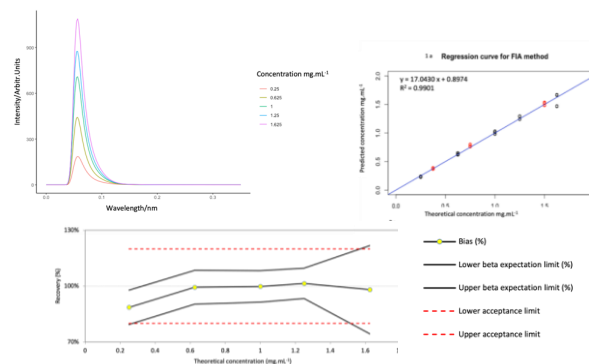
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| <p><b>FIA-UV</b></p> <ul style="list-style-type: none"> <li>❖ Dionex Ultimate® 3000 LC system (ThermoFisher)</li> <li>❖ DAD between 200 and 400 nm</li> <li>❖ Lambda max 245 nm</li> <li>❖ Chromeleon® software</li> </ul> | <p><b>Raman spectroscopy</b></p> <ul style="list-style-type: none"> <li>❖ Handheld device MIRA (Methrom)</li> <li>❖ Laser at 785 nm</li> <li>❖ Spectral acquisition 400 – 2300 cm<sup>-1</sup></li> <li>❖ Acquisition time 3 sec</li> </ul> |
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Data analysis

- ❖ Rstudio® software
- ❖ Univariate analysis for FIA-UV : r<sup>2</sup>, accuracy profile, LLOQ, linearity range
- ❖ Multivariate analysis for Raman spectroscopy : PLS-regression, r<sup>2</sup>, RMSEP, accuracy profile, LLOQ, linearity range
- ❖ Comparison by Bland-Altman method with the real life sample

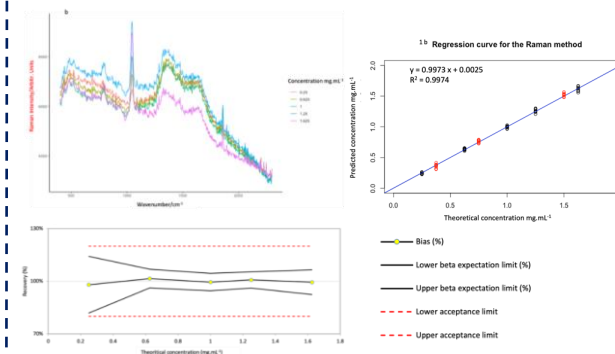
## RESULTS

### 1 – FIA-UV analysis



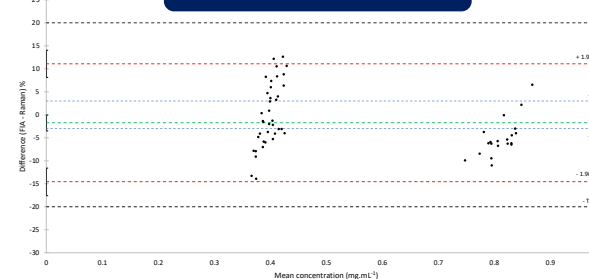
- ❖ r<sup>2</sup> = 0.989
- ❖ LLOQ at 0.37 mg.mL<sup>-1</sup>
- ❖ Validated linearity range from 0.37 to 1.625 mg.mL<sup>-1</sup>.

### 2 – RS analysis



- ❖ Spectral pretreatment ALS-SG
- ❖ Regression coefficient = 0.998
- ❖ RMSEP = 0.031 mg.mL<sup>-1</sup>
- ❖ LLOQ = 0.25 mg.mL<sup>-1</sup>
- ❖ Validated linearity range 0.25 – 1.625 mg.mL<sup>-1</sup>

### 3 – Comparison method



The studied concentration were 0.4 mg.mL<sup>-1</sup> and 0.8 mg.mL<sup>-1</sup> which were the therapeutic concentration. For both method, the relative error of patient sample were in the interval [-15% ; +15%], which are the acceptable limit in the routine.

## DISCUSSION - CONCLUSION

Despite difference of the linearity ranges of the two methods, the bland Altman plot confirmed the interchangeability of the two methods for analyzed samples and the potential of Raman spectroscopy to control Remdesivir during clinical preparation in hospital.