Fortis™ Technologies Ltd.

Application Note

Antiretrovirals

Introduction

Ritonavir is often used in combination with other medications to treat HIV/AIDS. Lopanivir and Ritonavir are both protease inhibitors which work by reducing the amount of HIV in the blood. Trials are currently been undertaken to see how effective this combination antiretroviral can be against SARS-CoV-2 (COVID-19). If it can help to reduce the mortality rate of hospitalised patients then it may be another tool in the fight against COVID-19. We are already seeing use of Dexamethasone a corticosteriod drug having positive results against COVID-19 (see Dexamethasone Application Note)

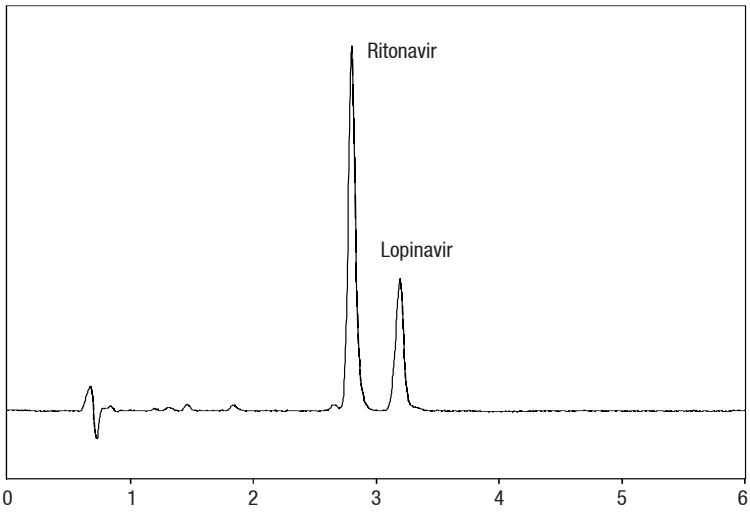

Figure 1. Separation of Ritonavir and Lipinavir

"Antiretrovirals have shown great use against HIV and now in the fight against SARS-Covid-19"

The drug itself is cheap and readily available therefore should be easily sourced and applicable to aid all nations in the fight against COVID-19.

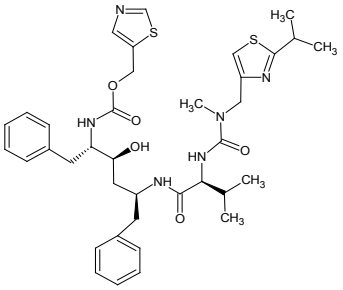

Figure 2. Structure of Ritonavir

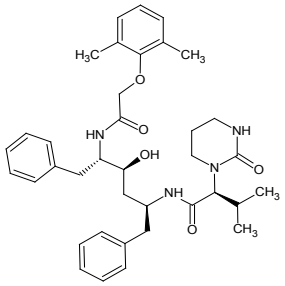

Figure 3. Structure of Lopinavir

Experimental Analysis

In this application note we show the ability of a core-shell C8 column in conjunction with a simple mobile phase to retain and quantify the drugs Ritonavir and Lopinavir.
A simple mobile phase and fast analysis time allows for high throughput of samples. The conditions used will aid in producing a robust and repeatable method for the drugs and any metabolites.

The SpeedCore C8 column used is designed around a core-shell particle with a homogenous surface coverage of alkyl chain C8 ligand. Good reproducibility and stability are key aspects of this phase.

Experimental Conditions

Column: 2.6µm SpeedCore® C8 100x2.1mm
p/n SC08-020526
Mobile phase
A: 50:50 Water : ACN + 0.1% formic acid
Flow Rate: 0.3ml/min
Temp: 40ºC
Detection: 230nm

Conclusion

In this application note we have shown a robust LC method for the protease inhibitor Lopinavir in conjunction with Ritonavir. The analysis is completed in under 5 minutes, however if further gains in speed were required there is scope to decrease the size of the column or to increase the organic proportion of the mobile phase or increase the temperature to obtain a faster run time. Or if other metabolities were found then there is plenty of scope to slow the method down to gain increased resolution.

The use of a core-shell C8 particle has provided a significant gain in performance in terms of speed and sensitivity for these compounds. With the simple mobile phase used it would be simple to transfer this to LC-MS if required.

Fortis™ Technologies Ltd.

Fortis™ Technologies Ltd.

45 Coalbrookdale Road
Clayhill Industrial Park
Neston
Cheshire, UK
CH64 3UG

t: +44 151 336 2266
f: +44 151 336 2669
www.fortis-technologies.com
e: info@fortis-technologies.com

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