



# BILIRUBIN REMOVAL BY PLASMAFILTRATION-ADSORPTION



## ex-vivo ADSORPTION KINETIC MODEL

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### OBJECTIVE

We conducted an ex-vivo study to assess the ability of the BS330 Plasma Bilirubin Adsorption Column cartridge (Jafron Biomedical, Zhuhai City, China) to remove bilirubin from plasma.

- We used a minimodule downscaled 1:3 containing approximately 131 g of BS330 sorbent beads and a dedicated machine for extracorporeal treatment simulation named GALILEO
- Using synthetic bilirubin powder, we obtained a plasma solution with a bilirubin concentration of 92.8 mg/dL.

### METHODS

The adsorption trend was evaluated as the bilirubin concentration gap ( $\Delta C$ ) between inlet (C<sub>pin</sub>) and outlet (C<sub>pout</sub>) lines.

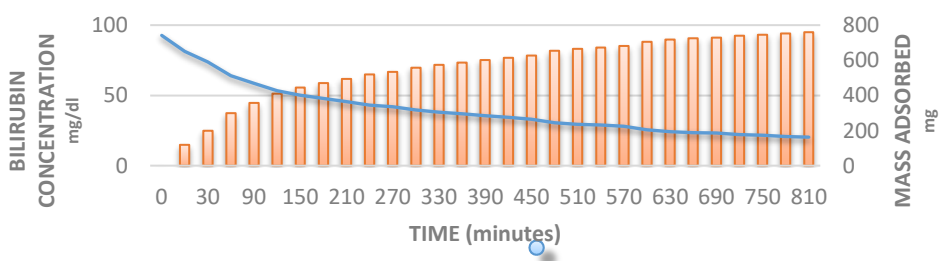
Removal ratio (RR) at a given time point was calculated as mass adsorbed at a given time point.



### RESULTS

- The change in concentration across the cartridge at 30 minutes was 16.5%.
- The capacity of the cartridge to adsorb bilirubin and cartridge saturation was reached at 750 minutes, 759 mg of bilirubin has been retained with a Removal Ratio of 78.1%. Therefore, the adsorption capacity of the resin was estimated at 5.76 mg of bilirubin per gram of sorbent.
- The dynamic adsorption curve (Figure) indicates a fast and efficient removal of bilirubin by BS330 in the beginning of perfusion with a Removal Ratio of 42.6% at 120 minutes.

#### Bilirubin Concentration vs Mass adsorbed



### CONCLUSION

Our findings provide the first assessment of bilirubin adsorption in an ex-vivo model of plasma perfusion and can be used to design interventional studies in humans with appropriately sized cartridges applied for an optimal time period.

### BIBLIOGRAPHY

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