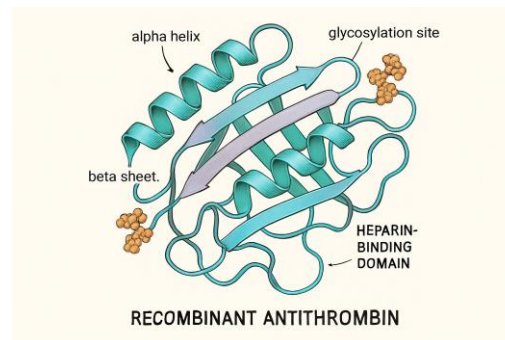


Technology offer IP-032

Antidote for low-molecular-weight heparins

Researchers from IMIB have developed an antidote based on a recombinant antithrombin against low molecular weight heparins, which binds with high affinity to heparin, reversing its anticoagulant effect without inhibiting coagulation proteases. It is useful for treating bleeding complications in patients anticoagulated due to thromboembolism, acute coronary syndrome, atrial fibrillation, cardiopulmonary bypass, hemodialysis, or the use of vascular catheters.



State of development

TRL-4 Laboratory validation

Industrial Property

Spanish and PCT patent application

Priority date: 15/6/2023

Objective of the collaboration

License and/or co-development

Contact

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Market needs

Heparin is a widely used anticoagulant drug for thrombosis, pulmonary embolism, and cardiovascular procedures, but its use carries a high risk of bleeding and thrombocytopenia. Its action is based on binding to antithrombin, inhibiting key targets of coagulation such as FXa and FIIa. Dysregulation of this mechanism can lead to severe complications associated with excessive anticoagulation. Currently, there is only one effective antidote for unfractionated heparin (protamine sulfate), which has limited efficacy and significant adverse effects. Therefore, there is an urgent clinical need for new treatments to reverse the effect of low-molecular-weight heparins and improve the safety of anticoagulated patients.



Technical solution from IMIB

The technology is based on an antidote using a recombinant antithrombin with specific mutations that increase its affinity for heparin without inhibiting coagulation proteases. In *in vitro* assays with plasma from anticoagulated patients, this antidote effectively reversed the anti-FXa activity of low-molecular-weight heparins. Additionally, in *in vivo* mouse models, its ability to rapidly neutralize the anticoagulant effect was demonstrated, offering an effective and safe therapeutic alternative against the bleeding risk associated with heparin treatment.

Benefits

- It is expressed 2.5 times more than the wild-type protein, reducing production costs.
- More potent and specific mechanism of action than current treatments.
- Increased affinity for heparin, reducing unwanted interactions.
- It lacks anticoagulant activity.