

Wednesday, October 16th, 2014

LSC 3 - Life Sciences Centre

2350 Health Sciences Mall

11am-12pm



Dr. Jennifer Dumont

*Scientific Director in Global Medical
Biogen Idec*

“Molecular engineering of coagulation factors to prolong half-life”

Hemophilia A and B are bleeding disorders characterized by a deficiency of functional clotting factors VIII (FVIII) or IX (FIX), respectively. Prophylactic replacement factor treatment improves clinical outcomes but requires frequent infusions. Molecular engineering has been applied to factors VIII and IX as an approach to extend half-life and reduce the number of infusions to control and prevent bleeding episodes in people with hemophilia A and B, respectively.

A natural pathway responsible for providing the long half-life of IgG has been leveraged to create long-lasting clotting factors. Fc fusion factors are composed of a single molecule of recombinant factor VIII or IX covalently fused to the dimeric Fc domain of IgG1. Half-life is prolonged through binding of the Fc portion of the fusion proteins to the neonatal Fc receptor (FcRn) which delays lysosomal degradation and recycles them back into the circulation. rFVIII-Fc and rFIX-Fc are now approved in Canada for adults and children (≥ 12 years) with hemophilia for routine prophylactic treatment and the control and prevention of bleeding episodes. Phase 3 clinical studies in patients with severe hemophilia A and B demonstrated that rFVIII-Fc and rFIX-Fc were well-tolerated and resulted in low bleeding rates.

FVIII circulates as a non-covalent complex with von Willebrand factor (VWF) which plays a role in the clearance of FVIII. It is postulated that the interaction with VWF may limit further extension of half-life beyond what has been observed for the current long-lasting technologies (approved and in development). A novel approach to further extend the half-life of FVIII is being studied where this interaction (FVIII:VWF) is decoupled and the genetic incorporation of novel biopolymer enables an additional increase in circulating half-life. Preclinical data will be presented on this novel bioengineered FVIII molecule.

Sponsored by:



biogen idec®