PRODUCT PIPELINE | FACTOR VIII & VWF (FEBRUARY 29, 2016)

NAME	COMPANY	TYPE	CLINICAL TRIALS	DESCRIPTION
rFVIIIFc (BIIB031 or Eloctate®)	Biogen Idec/Swedish Orphan Biovitrum (Sobi)	Recombinant factor VIII	A Phase III trial for people aged 12 or older (A-Long) started in late 2011 and was completed in 2013. In April 2014, Biogen and Sobi announced positive safety and efficacy results in the trial for children under 12. FDA and Health Canada approved Biogen's submissions in summer 2014. In November 2015, Eloctate was approved by the European Medicines Agency for all ages. Eloctate was approved for reimbursement in Quebec in April 2015 based on specific eligibility criteria. In the rest of Canada, Eloctate was approved for reimbursement in December 2015 and is now available.	The Fc fusion technology binds the FVIII molecule to a recombinant human immune globulin molecule to extend half-life. Trials showed a half-life extension from 12 to 19 hours, an approximate 1.5 fold increase in half-life of FVIII compared to Advate (Baxalta). No inhibitors developed among the 164 adults and children who completed the trials.
Bax 111 (vonicog alfa) (Vonvendi in the U.S.)	Baxalta	Recombinant von Willebrand factor	In August 2015, Baxalta announced the publication of pivotal Phase III study results of Bax 111 with 37 patients with Type 3 VWD. Bleeding was treated successfully in all patients. In December 2015, the U.S. FDA granted Baxalta a biologics license for Vonvendi.	This is a recombinant von Willebrand factor that preserves ultra-high molecular weight multimers for the treatment of VWD. Its mean half-life is 21.9 hours.
Kovaltry (formerly BAY81-8973)	Bayer	Recombinant factor VIII	Phase III trials have been completed in children aged one to 12 and adults. Health Canada approved Kovaltry in January 2016. Starting in mid-2016, Kovaltry is expected to gradually replace Kogenate FS.	This is a 3rd generation full-length rFVIII manufactured without exposure to human and animal proteins. Bayer reports half-life is slightly extended compared to Kogenate.
Zonovate® in Canada and NovoEight in the rest of the world (Turoctocog alfa)	Novo Nordisk	Recombinant factor VIII	Two Phase III trials with more 210 people have been completed. Zonovate was approved by Health Canada in January 2015. NovoEight™ is approved by the U.S. FDA, EMA, and regulatory authorities in Japan and Australia.	This is a 3rd generation rFVIII manufactured without exposure to human proteins and with a normal half-life. Phase III trials showed no inhibitors in 213 previously treated patients.
Nuwiq® Human-cl rhFVIII (simoctocog alfa)	Octapharma	Recombinant factor VIII	A Phase III trial has been completed and marketing authorization was granted in Canada for patients of all ages. Approvals have also been given in the U.S., Europe and Australia. During the trials, no inhibitors developed in 135 previously treated adults and children.	This is a rFVIII with human-like post-translational modifications, which it is hoped will result in a lower rate of inhibitors. It does not contain antigenic hamster residues. It is produced in a human embryonic kidney cell line. Octapharma's PK trials showed a slighlty extended half-life compared to Advate.

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N8-GP (turoctocog alfa pegol)	Novo Nordisk	Recombinant factor VIII	The pathfinderT2 Phase III trial for hemophilia A patients aged 12 years or older was completed in March 2014. 175 patients were treated prophylactically (50 IU/kg every 4 days, resulting in a mean trough level of 8%) and 11 patients were treated on demand. One inhibitor developed among the 186 patients treated.	This glycopegylated rFVIII was shown to have a half-life of 18.4 hours, approximately 1.5 times most current treatments.
BAY94-9027	Bayer	Recombinant factor VIII	In February 2014, Bayer announced positive results from its *Protect VIII* Phase III trial in 134 adolescents and adults, who received FVIII every 7, 5 or 3.5 days. The study met its primary objective of protection from bleeds with fewer infusions. No inhibitors were reported.	This is a pegylated, long-acting plasma/albumin free, full-length rFVIII. The goal is to increase half-life and reduce the frequency of infusions.
Adynovate (Bax 855)	Baxalta	Recombinant factor VIII	In August 2014 Baxalta reported positive results from its pivotal Phase III trial that included 137 adolescent and adult patients. No inhibitors or allergic reactions were reported. The U.S. FDA approved Adynovate for adults and adolescents, aged 12 years and over, in November 2015.	This is a pegylated, long-acting plasma/albumin free, full-length rFVIII. The goal is to increase half-life and reduce the frequency of infusions. The Phase III trial showed a half-life of 1.4 times that of Advate. None of the patients in the trial developed an inhibitor.
rVIII-SingleChain	CSL Behring	Recombinant factor VIII	In June 2015 CSL announced results of its Affinity Phase I/III study with 175 subjects. In May 2014 CSL announced the start of a Phase III trial to enroll 50 previously treated patients under the age of 12.	This is a novel recombinant single-chain factor VIII design that uses a strong, covalent bond to von Willebrand factor to reduce clearance and extend half-life compared to traditional factor VIII. No inhibitors developed after 14,000 exposure days in 175 study subjects.
Anti-factor IXa/X bispecific antibody ACE910	Chugai Pharmaceutical Co &Roche	A monoclonal antibody that acts as a FVIII-mimetic cofactor	In June 2015 Roche announced results from its Phase I trial. Subjects received weekly sub-cu injections of ACE910 for 6 to 18 months. The product was well tolerated and significantly reduced annual bleeding rates, even in patients with FVIII inhibitors. In September 2015, Roche announced ACE910, had been awarded breakthrough designation by the U.S. FDA. Such a designation means that preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies. Moreover, FDA will expedite the development and review of such a drug. Roche hopes to start a pivotal Phase III trial by the end of 2015.	ACE910 is a bi-specific antibody that mimics coagulation factor VIII with a half-life of three weeks. ACE910 may offer an alternative on-demand treatment option for patients with hemophilia A with or without inhibitors, as well as user-friendly, sub-cutaneous routine prophylaxis.