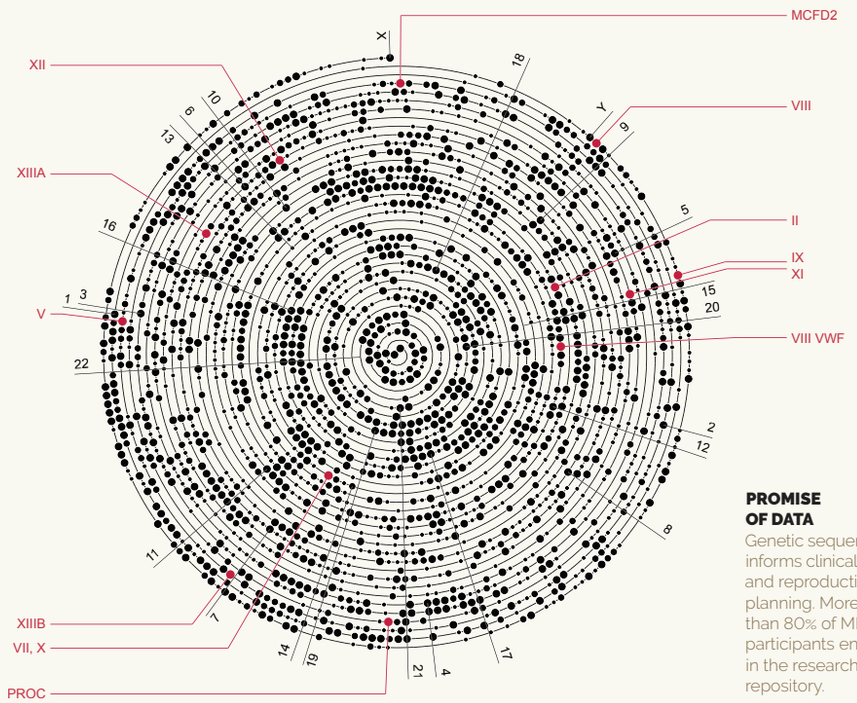
Decoding Hemophilia

Thousands genotyped by *My Life, Our Future*, gene therapy for hemophilia B advances and Hemlibra receives expanded approval



PROMISE OF DATA
Genetic sequencing informs clinical care and reproductive planning. More than 80% of MLOF participants enrolled in the research repository.

ASSESSING THE MY LIFE, OUR FUTURE GENOTYPING PROJECT

A recent article in the journal *Haemophilia* analyzed the *My Life, Our Future* (MLOF) genotyping project, a partnership between the American Thrombosis and Hemostasis Network (ATHN), the National Hemophilia Foundation (NHF), Bloodworks Northwest and Bioverativ (formerly Biogen).

From 2012 through 2017, MLOF offered free genotyping at US hemophilia treatment centers (HTCs) to hemophilia patients, genetic carriers and potential carriers. Genotyping determines the specific mutation of the factor VIII and factor IX genes that cause hemophilia A and hemophilia B, respectively. In all, 11,356 individuals took part in the MLOF program, with genotyping analysis completed in 9,453.

Also key to the MLOF program is the MLOF Research Repository. Participants had the option to contribute their coded genetic data to be stored by ATHN and their coded blood sample to be stored by Bloodworks Northwest for use by researchers. Overall, 81% of MLOF participants enrolled in the research repository. In addition, 5,141 participant blood samples are receiving whole-genome sequencing with the help of the National Heart, Lung, and Blood Institute program Trans-Omics for Precision Medicine (TOPMed). The TOPMed program is part of the National Institutes of Health's Precision Medicine Initiative, which was established to provide disease treatments tailored to a person's "unique genes and environment."

In their summary, the *Haemophilia* article authors wrote that "MLOF is the largest genetic programme in haemophilia to date, providing genetic information for patients and their families to help inform clinical care and reproductive planning....." Furthermore, they wrote, "MLOF has demonstrated the power of diverse organizations working together to advance science, expand knowledge and improve health outcomes."

UNIQURE: AMT-061 FOR HEMOPHILIA B

In August, uniQure announced the first patient with severe or moderately severe hemophilia B was treated as part of the company's phase 2b dose-confirmation study of its investigational gene therapy product AMT-061. Study participants will receive a single intravenous infusion of AMT-061. After the dose, patients' factor IX (FIX) activity will be assessed over six to eight weeks.

AMT-061 delivers a mutated hyperactive version of the FIX gene, called the Padua variant, to liver cells, which reportedly results in eight to nine times more FIX activity compared with the wild-type FIX protein. UniQure is also recruiting patients for its phase 3 HOPE-B (Health Outcomes with Padua gene; Evaluation in Hemophilia-B) trial of AMT-061 for adults with moderately severe or severe hemophilia B. Dosing of patients in the HOPE-B trial is expected to begin in the first quarter of 2019.

FDA APPROVES HEMLIBRA® FOR HEMOPHILIA A WITHOUT INHIBITORS

In October, the US Food and Drug Administration (FDA) approved Genentech's Hemlibra for routine prophylaxis to prevent or reduce the frequency of bleeding episodes in adults and children with hemophilia A without factor VIII inhibitors. In fall 2017, FDA approved Hemlibra for use by adults and children with hemophilia A *with* FVIII inhibitors. Hemlibra is a laboratory-engineered protein that performs a key function in the clotting cascade normally carried out by the FVIII protein, which is deficient in people with hemophilia A.

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