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The Swiss Rare Donor File under the care of Blood Transfusion Service Zurich – Facts and Future

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Background
Since January 2023, the Swiss Rare Donor File (RDF), the national registry of blood donors with absence for high-frequency antigens (ag), has been managed by Blood Transfusion Service Zurich (BTSZ). The RDF enables rapid identification and allocation of compatible Red Blood Cells (RBC) units for patients with public-antibodies. The registry is essential for ensuring adequate transfusion support within Switzerland (CH) and, if required, internationally.

Methods
Rare blood donors in CH are identified using efficient high-throughput genotyping and routine phenotyping methods. Twice a year, data on rare donors are provided by all 11 regional blood services (IRB, GE, BS, JU, SG, LU, AG, FR, GR, TI and ZH) and are coordinated by BTSZ. These data are accessible to all blood services and healthcare professionals. Inclusion generally requires active donors with at least one donation within the last five years. Exceptions are made for certain donors who are only contacted when needed - e.g. those with very rare phenotypes such as XK:-1 or hh.

Results
The Swiss RDF currently includes ~1,200 donors, with the most commonly identifies ag rarities being FY:-1,-2, KEL:-2 YT:-1 and LU:-2. Extremely rare phenotypes like DI:-2, hh, XK:-1, MNS:-3,-4,-5) are also represented. National requests for rare blood products were managed either by our IH team or directly by the respective services. International requests were forwarded through the International RD Panel or the ISBT RD Working Party. Over the past 2 years, we provided 33 RBC units to fulfill national—and, in rare instances, international—requests. International inquiries for JR:-1 and JK:-1,-2 could not be met. In the context of European collaboration, 4 cryopreserved units (--D-- and hh) were imported for 2 pregnant women.

Conclusion
The Swiss RDF provides essential support for the supply of rare blood products in CH and abroad. To maintain the database, time-consuming and costly donor genotyping and phenotyping of a very large number of blood donors will continue to be crucial in the future. We aim to expand the ag specificities to include additional relevant rare ag, e.g. variants of the RHCE system, improving donor–patient matching. Other upcoming projects comprise expanding the RDF to cover very rare ag combinations aiming to meet the growing demand of transfusion dependent patients such as those with hemoglobinopathies. Additionally, a "Care for Rares" program has been initiated to enhance donor engagement and raise their awareness.