

Challenges and Benefits of Biobank Certification: CRYOSTEM Unique Experience

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1 Introduction

The world of biobanking is currently facing multiple challenges, including setting up and implementation of **highly operational and successful Quality Management System (QMS)**. By supplying not only biological resources but also clinical data, biobanks are fully integrated to the world of fundamental and translational clinical research. Thus, samples collection quality, partners commitment, users satisfaction questionnaires are major players to succeed in biobank sustainability and valorization.

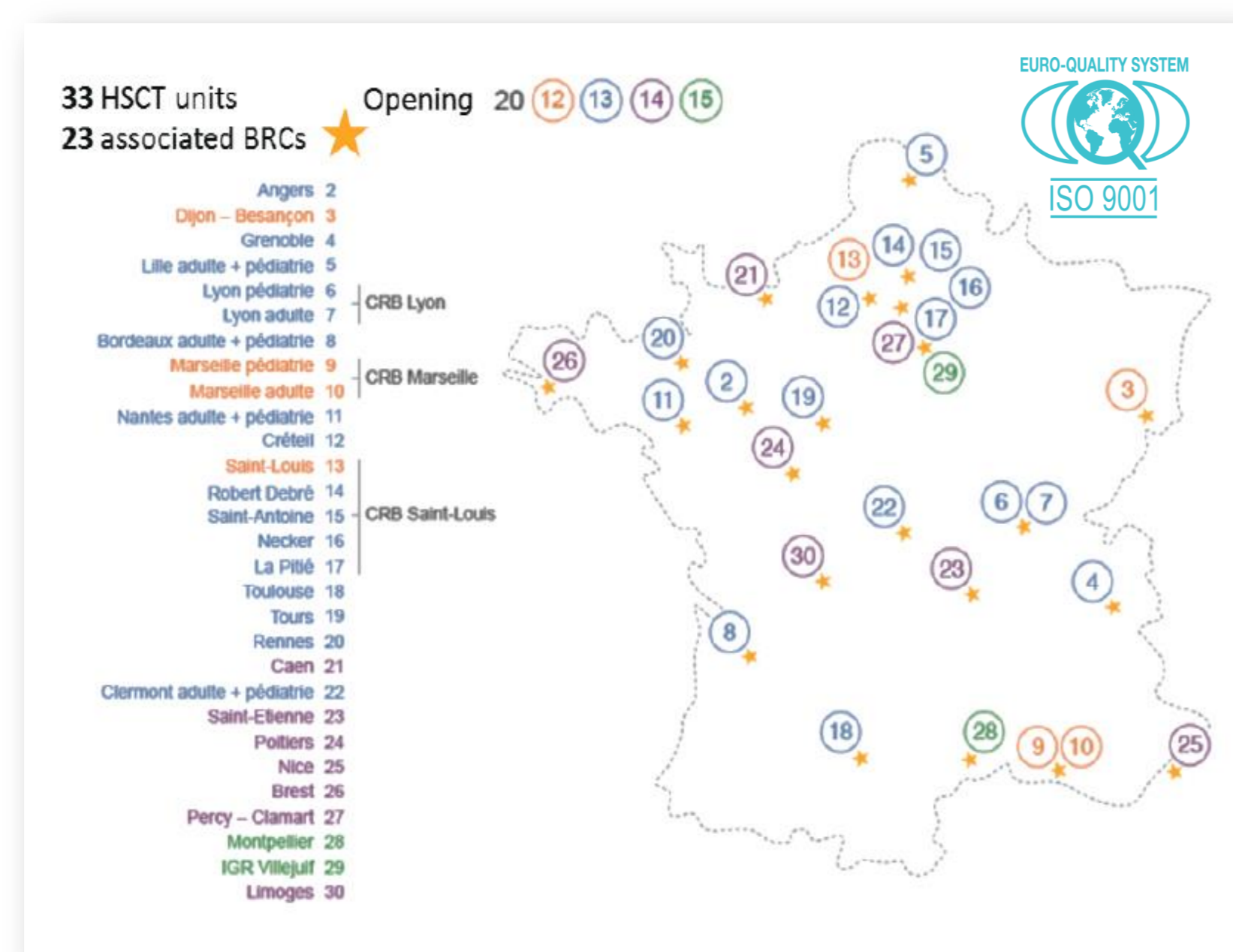
CRYOSTEM biobank was initiated in 2010 by Prof. Régis Peffault de Latour and Dr. Boris Calmels, and promoted by the Francophone Society for Stem Cell Transplantation and Cell Therapy (SFGM-TC) to establish a **nationwide, prospective and standardized multicenter cohort** and to answer to the lack of large-scale cohorts in the field of **Hematopoietic Stem Cell Transplantation (HSCT) complications**, including **Graft versus Host Disease (GvHD)**. The goals were to improve understanding and knowledge in the field, speed up biomarkers discovery and develop curative treatments.

Since its creation, CRYOSTEM has have to face challenges in the set up of its QMS, notably related to its structuring and functioning as a network. Consequently, since 2014, CRYOSTEM has committed itself to a quality driven approach with the aim of obtaining **ISO 9001 certification**. The ISO 9001 international standard sets out the criteria for a QMS, customer needs and satisfaction, process control and continuous improvement. CRYOSTEM has implemented several actions to answer ISO 9001 requirements.

2 CRYOSTEM Network Structuring and Functioning

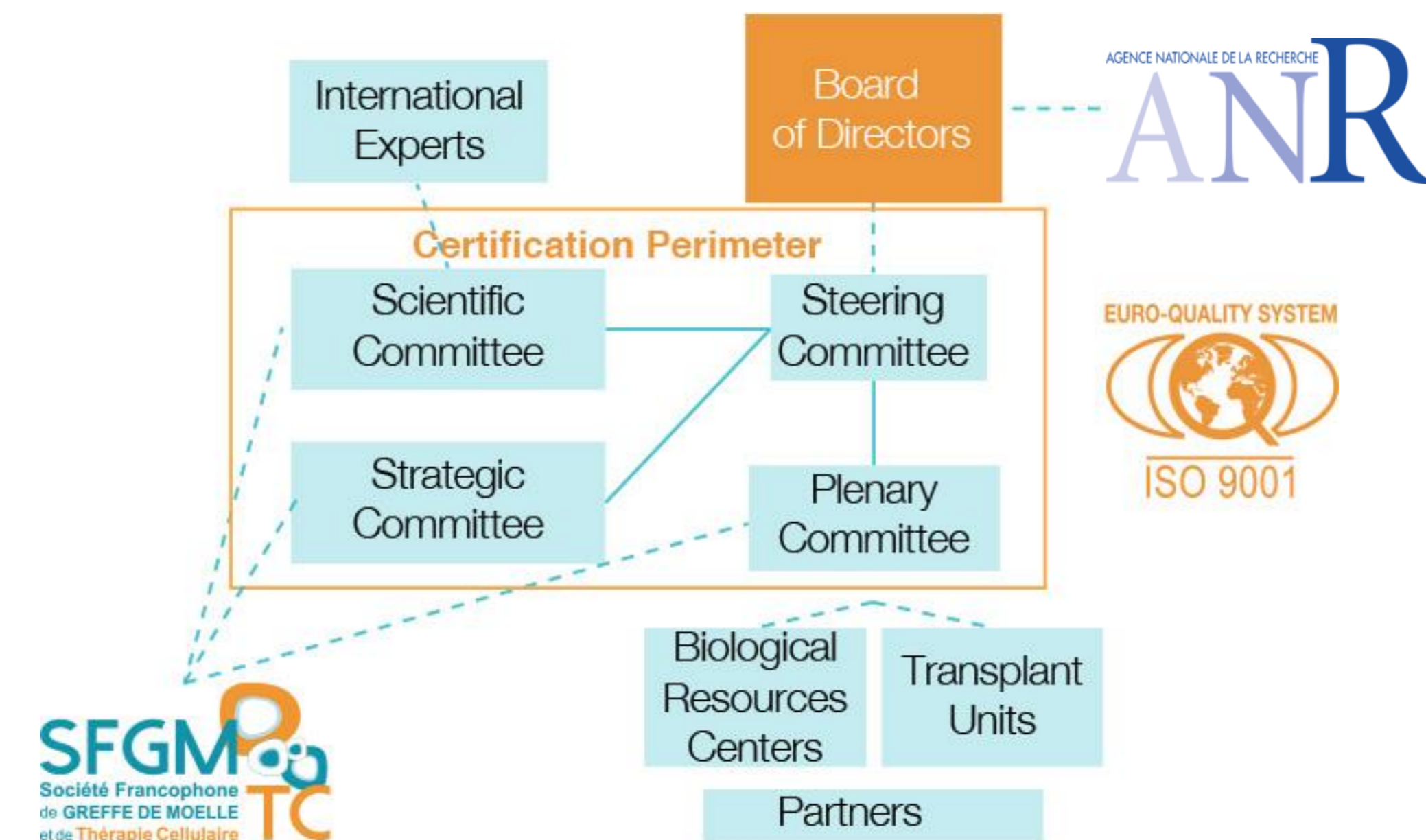
From 2012, CRYOSTEM has operated an enlarged network comprising currently **33 out of the 36 French HSCT Units (adult and pediatric) and 23 Biological Resources Centers (BRCs)**, leaning on their own **accreditations (JACIE) or certification (NF S 96-900 and ISO 9001)**. In only three years, CRYOSTEM has succeeded in enlisting **more than 400 health professionals** to work together on this collaborative project.

The strength of CRYOSTEM's organization is itself dependent on an operational network, involving efficient internal communication and interactivity between all partners and staff commitment so as to unify the 33 sites as one unique working whole.



Benefits:

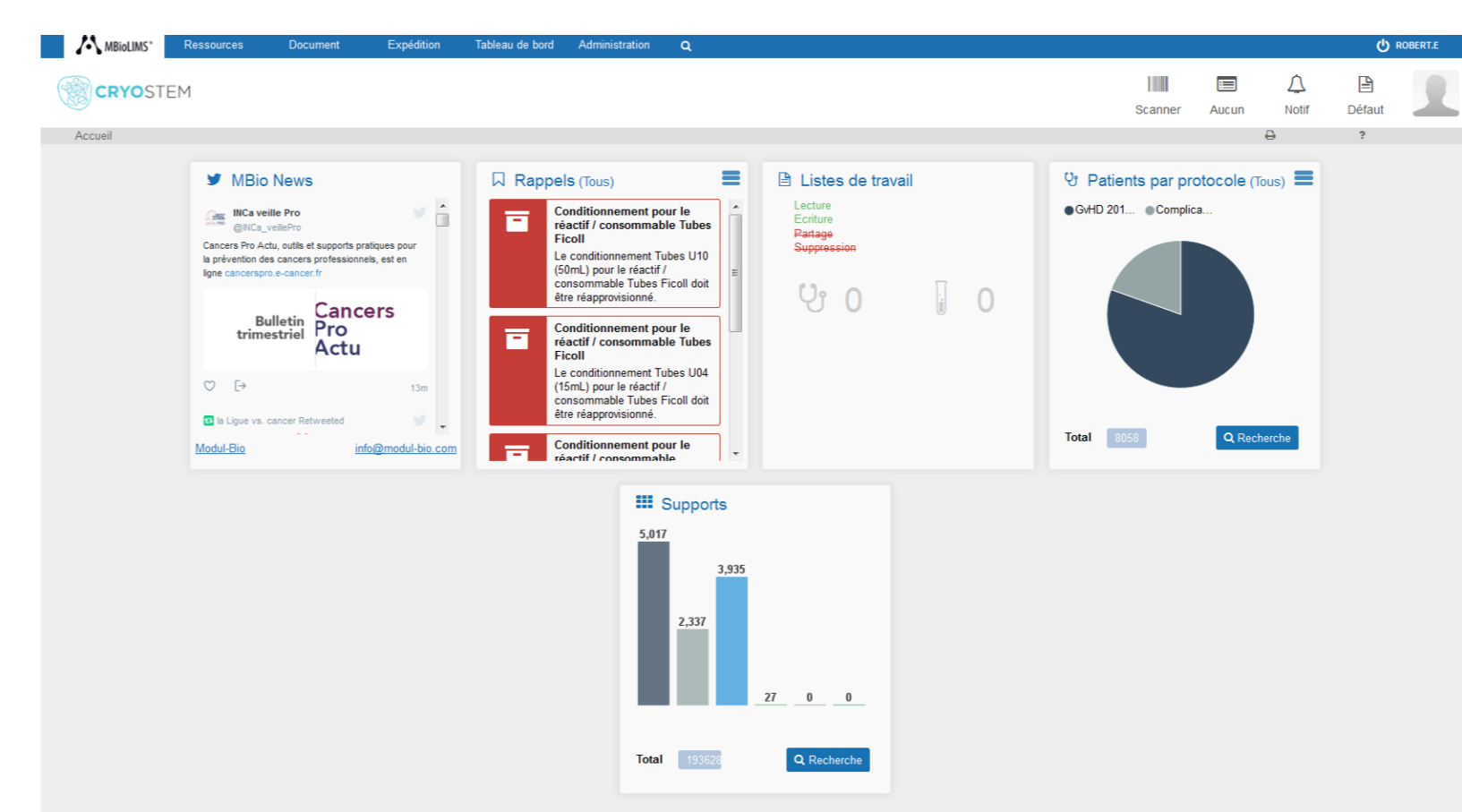
- **High inclusion rate :**
70% of the French transplanted patients included in CRYOSTEM with a mean inclusion rate of **100 patients/month**
- **Limited cryo-preservation delays :**
60% of blood samples treated in **less than 4 hours**



CRYOSTEM's governance comprises the Plenary Committee, the Steering Committee, the Scientific Advisory Board, which since October 2016 has been split into two sub-committees – the Scientific Board and the Advisory Board – to **rationalize meetings and decision-making**.

3 CRYOSTEM Samples & Data Quality

BRCs process blood samples in line with **standardized and harmonized procedures** so as to establish a **high-quality and homogeneous collection**, independently at each BRC. CRYOSTEM's governance provides **key reagents to BRCs**, so as to ensure that blood samples are processed in a homogenous manner. Three sample types are isolated and cryopreserved from blood samples: plasma, dried pellets, and viable cells in DMSO.

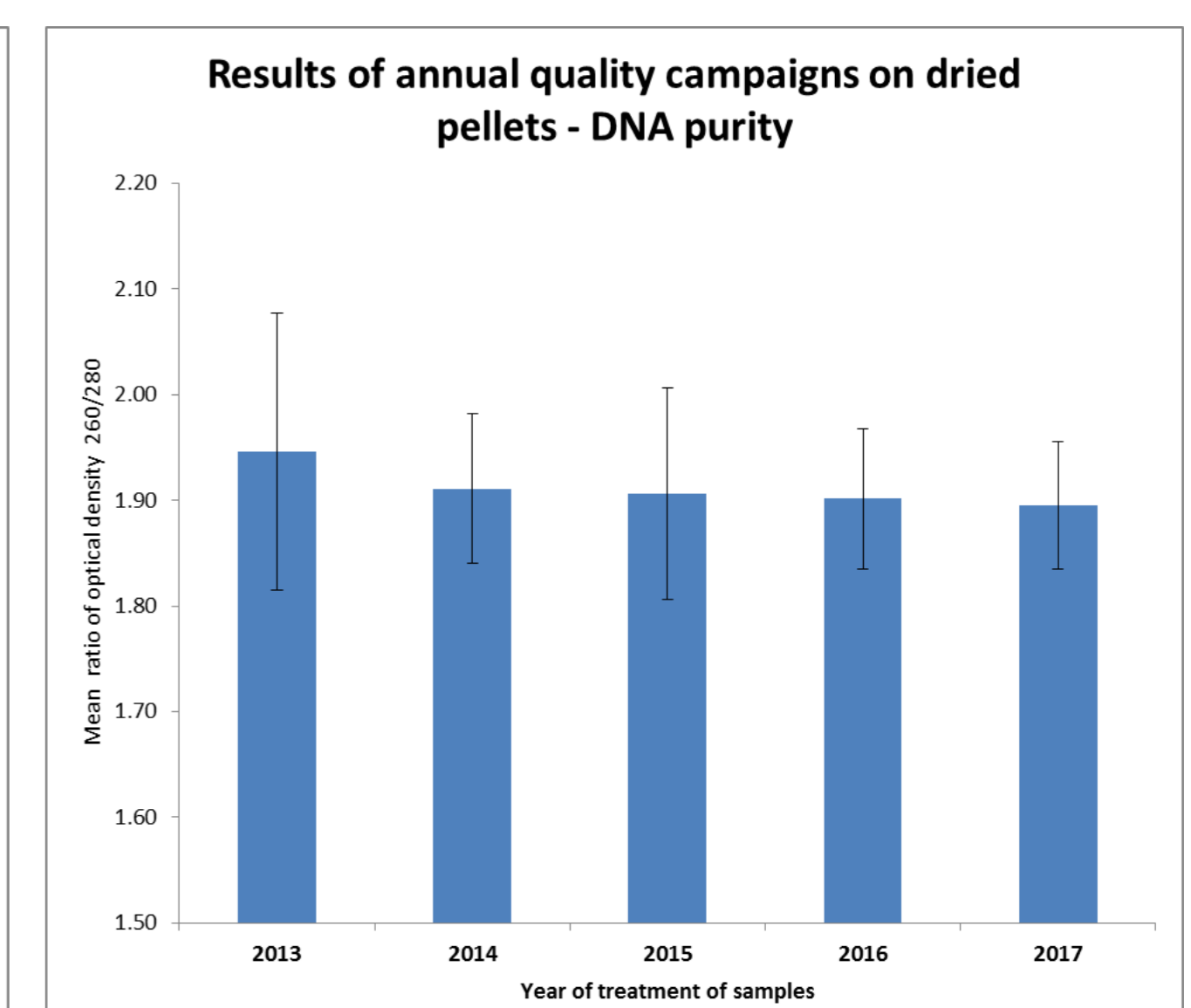
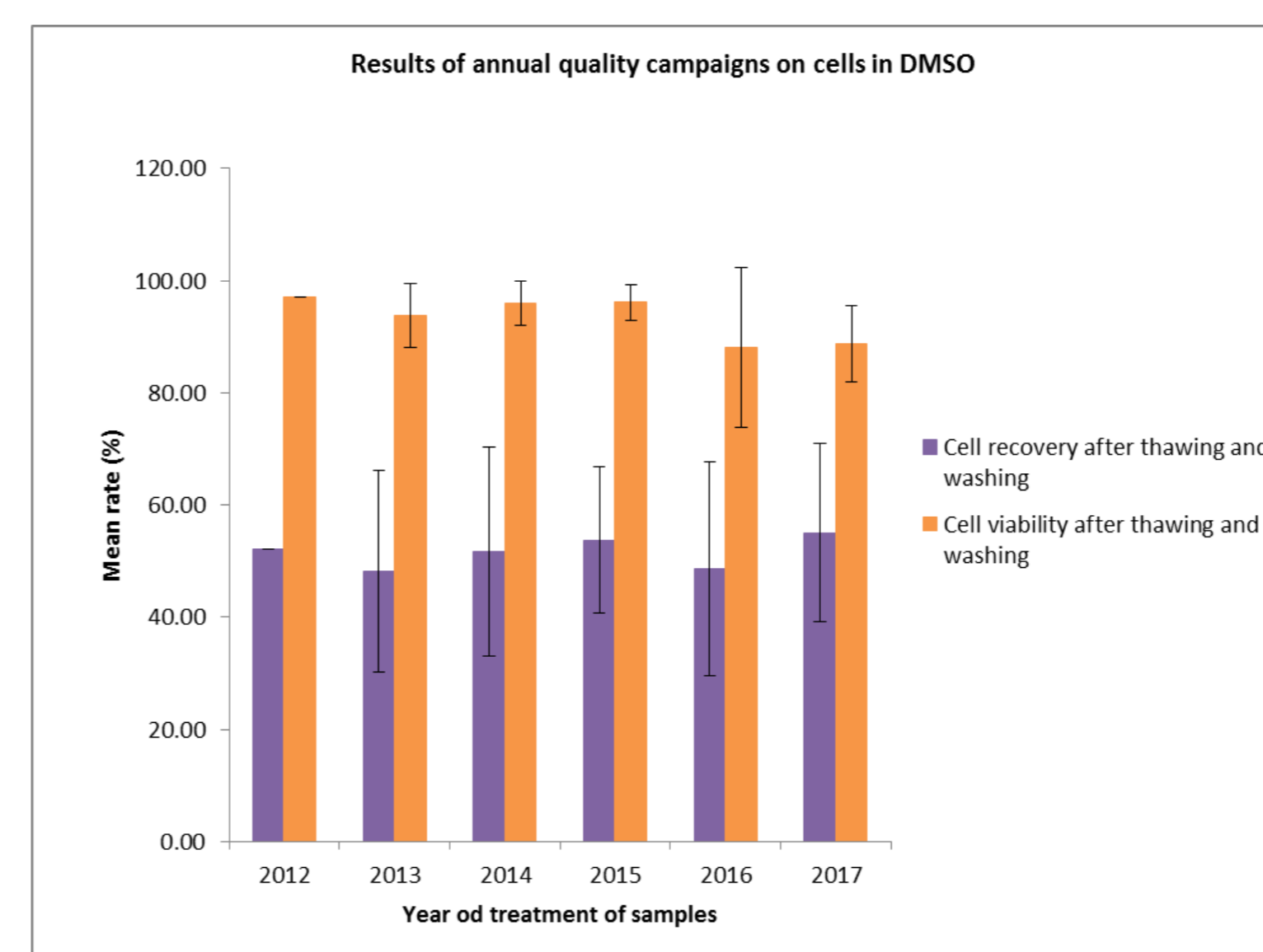


Benefits:

- Centralization of samples and data
- Homogenization of labelling
- Traceability
- Real-time monitoring of operations
- Better communication with BRCs
- SOP sharing

In only six years, **more than 5,500 patients and 2,300 donors** have been included in CRYOSTEM (as of February 28, 2018), and near to 200,000 samples have been generated from blood samples (plasma, dried pellets and viable cells in DMSO).

All the well-annotated clinical data associated to biological samples are centralized in a **unique secure database: the MBioLims CRYOSTEM**. The MBioLims is also directly linked to the EBMT (European Society for Blood and Marrow Transplantation) **European clinical database, PROMISE**. An exhaustive weekly **monitoring of biological and clinical data** entered into the database is ensured by a clinical data technician.



Annual quality control campaigns have been introduced since 2014. A consequent number of samples of cells in DMSO and dried pellets are selected yearly from BRCs of the network, for which **cell recovery and viability** after thawing and washing and **DNA purity** respectively are tested. The results highlighted the **high reproducibility** of the parameters tested since 2012.

In a long-term approach, CRYOSTEM builds upon **feedback received from users through satisfaction surveys** and the Scientific Advisory Board to regularly adjust sample nature and characteristics so as to enhance their relevance for research.

4 Conclusion

CRYOSTEM ISO 9001 certification was obtained in February 2015, barely one year after the QMS was established.

Benefits of ISO 9001 certification in a large-scale cohort are mainly felt at organizational and strategic levels. Moreover, ISO 9001 certification clearly plays a role in the network success and cohesion.

Finally, CRYOSTEM has just **successfully renewed its ISO 9001 certification, version 2015**, in last January. Considering these aspects, CRYOSTEM is a relevant example of biobank quality management.

If you are interesting for working on CRYOSTEM samples, please submit your project.