

# Developing a University Hospital-based Tissue Biobank

Hsu J.<sup>1\*</sup>, Rainer L.<sup>1\*</sup>, Cardilo-Reis L.<sup>1</sup>, Kölsch B.<sup>1</sup>, Dorner A.<sup>1</sup>, Mucher P.<sup>2</sup>, Bergmann M.<sup>3</sup>, Staber P.<sup>4</sup>, Bonelli M.<sup>5</sup>, Mozayani B.<sup>1</sup>, Regele H.<sup>1</sup>, Compérat E.<sup>1</sup>, Simonitsch-Klupp I.<sup>1</sup>, Haslacher H.<sup>2</sup>, Kain R.<sup>1</sup>, Hofer P.<sup>1</sup>

<sup>1</sup> Department of Pathology, Medical University of Vienna

<sup>2</sup> Department of Laboratory Medicine, Medical University of Vienna

<sup>3</sup> Department of General Surgery (Division of Visceral Surgery), Medical University of Vienna

<sup>4</sup> Department of Medicine I (Division of Hematology and Hemostaseology), Medical University of Vienna

<sup>5</sup> Department of Medicine III (Division of Rheumatology), Medical University of Vienna

\* equally contributing

## Introduction

The Medical University of Vienna Biobank is a joint initiative of collaborating clinical departments at the University Hospital Vienna (AKH), supporting researchers by providing multiple biobank services. The Department of Pathology (KIP) provides services for processing and storage of tissues and viable cells, addressing various requirements of clinical researchers. Maintaining and developing a university hospital-based tissue biobank involves working within the complex processes of a central university hospital. This entails implementing a systematically structured and regulated operational framework to facilitate efficient collaboration among various departments, researchers, and collaboration partners.

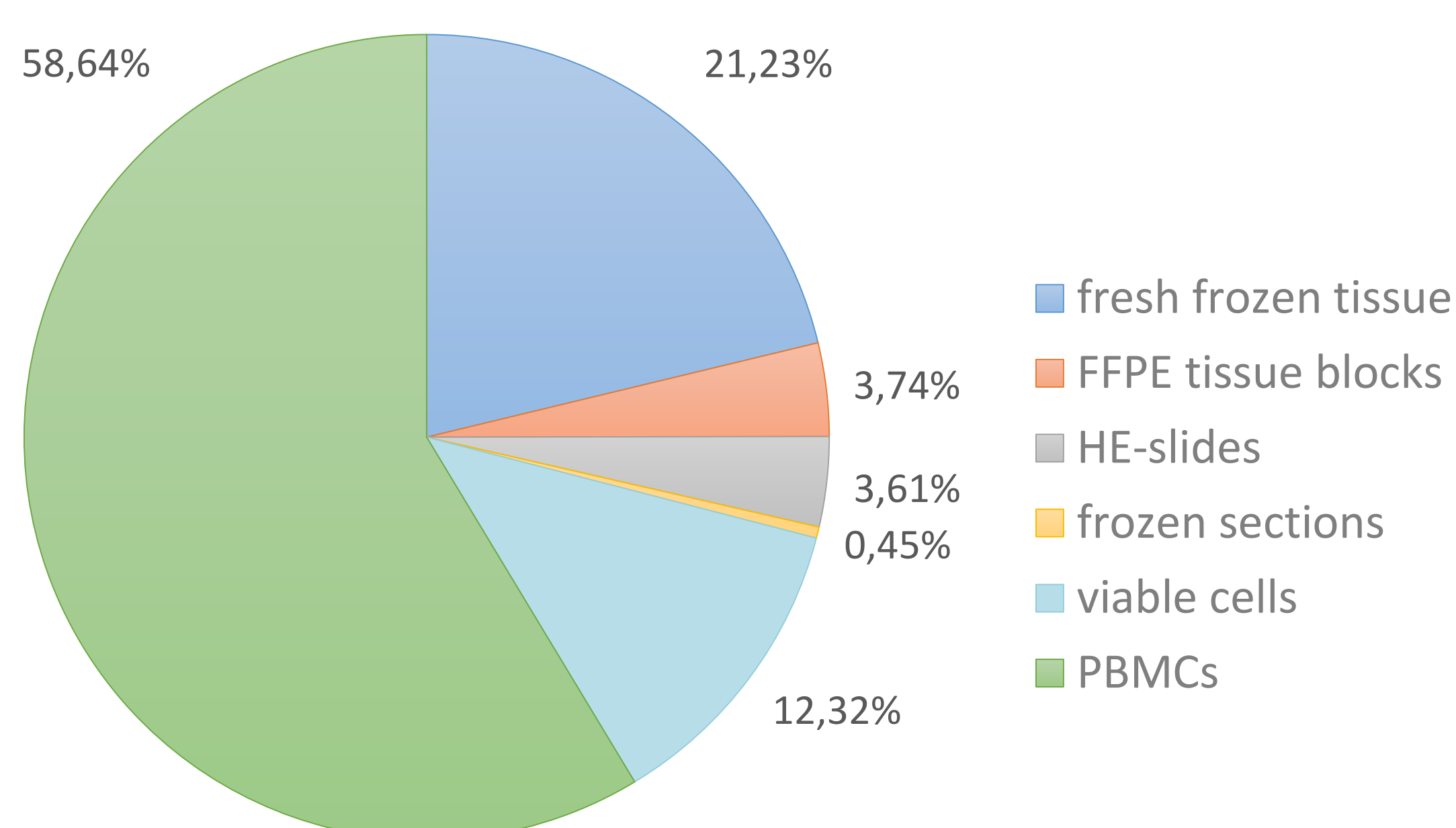


Figure 1: Percentage distribution by sample type of all collected and generated samples

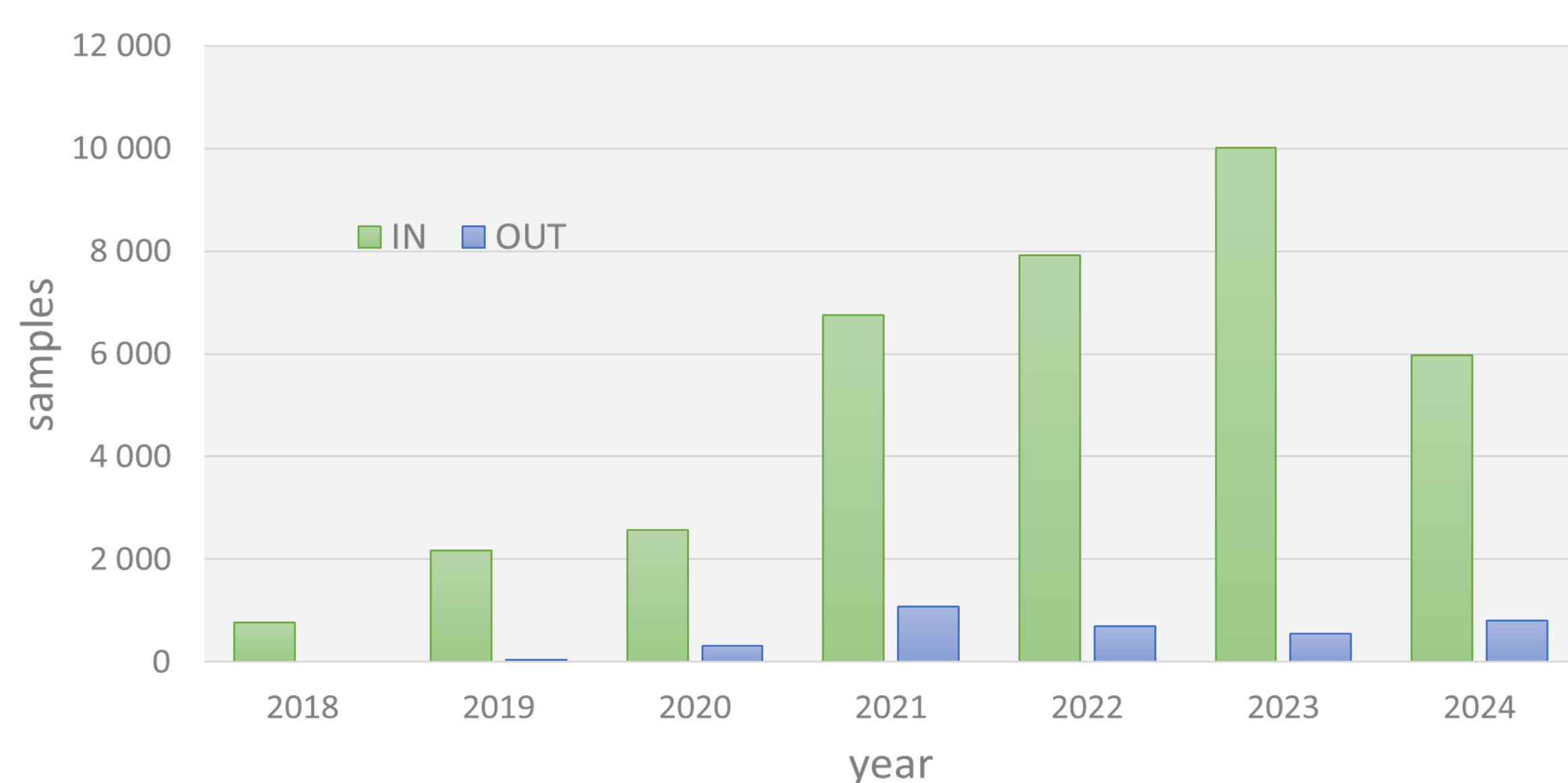


Figure 2: Diagram of all samples collected (IN) and provided (OUT) since the biobank was founded

## Materials and Methods

Since the Biobank KIP's establishment in 2018, over 30 ongoing biobank projects have been established, leading to a diverse sample collection. These include fresh frozen tissues, tissue-derived single-cell suspensions, peripheral blood mononuclear cells (PBMCs), formalin-fixed paraffin-embedded (FFPE) tissue blocks, hematoxylin and eosin (HE) stained slides, frozen sections, and cryo molds, stored under appropriate conditions (room temperature, -80 °C, -130 °C). Samples are either submitted by collaborators or generated within the Department of Pathology by the biobank team in close collaboration with specialized pathologists.

### Data management

The entire sample life cycle is meticulously documented, both the hard copy records as well as electronic recordings. Data categories include pre-analytical data and logistic information. Pre-analytical data is digitized and recorded for statistical evaluation and can be transferred to the MedUni Vienna's Research, Documentation and Analysis platform (RDA). The RDA is used to provide scientifically relevant data in a central database and serves as an interface between the patients treatment data and research data.

## Results

In total, about 37,000 samples have been collected or generated so far, of which about 3,500 samples were provided for diverse research projects including prospective studies.<sup>1) 2)</sup>

The MedUni Vienna Biobank KIP is a partner biobank of the Austrian national node of BBMRI-ERIC, and also participates in the national cross-audit program established within the QM work package of BBMRI.at.

## Discussion and Conclusion

In the course of continuously improving our quality and risk management system (ISO 9001:2015) we aim to achieve an ISO 20387 accreditation of our biobank in the medium-term future. Until then, we are motivated by expanding numbers of ongoing biobanking projects, biobanking services we are able to offer to our partners, and increasing numbers of samples provided for research projects.

Furthermore, we look forward to expanding our facilities and services to the newly built Center for Translational Medicine (CTM), which is prospected to open in 2027. Besides vast storage capabilities, the CTM will allow us to further evolve the already close collaboration of the biobanks and clinics across department borders.



Figure 3: Architectural visualization of the Center for Translational Medicine (CTM)

## References

- 1) Preglej, T., Tosevska, A., Brinkmann, M., Schatzlmaier, P., Simader, E., Sieghart, D., Hofer, P., Krausgruber, T., Dobnikar, L., Bock, C., Karonitsch, T., Kain, R., Ellmeier, W., Aletaha, D., Goeschl, L., & Bonelli, M. (2025). Time-resolved immune dynamics in rheumatoid arthritis under Methotrexate therapy. *bioRxiv (Cold Spring Harbor Laboratory)*. <https://doi.org/10.1101/2025.01.14.629357>
- 2) Mrak, D., Kartnig, F., Sieghart, D., Simader, E., Radner, H., Mandl, P., Göschl, L., Hofer, P., Deimel, T., Gessl, I., Kain, R., Winkler, S., Smolen, J. S., Perkmann, T., Haslacher, H., Aletaha, D., Heinz, L. X., & Bonelli, M. (2022). Accelerated waning of immune responses to a third COVID-19 vaccination in patients with immune-mediated inflammatory diseases. *Journal of Autoimmunity*, 135, 102981. <https://doi.org/10.1016/j.jaut.2022.102981>