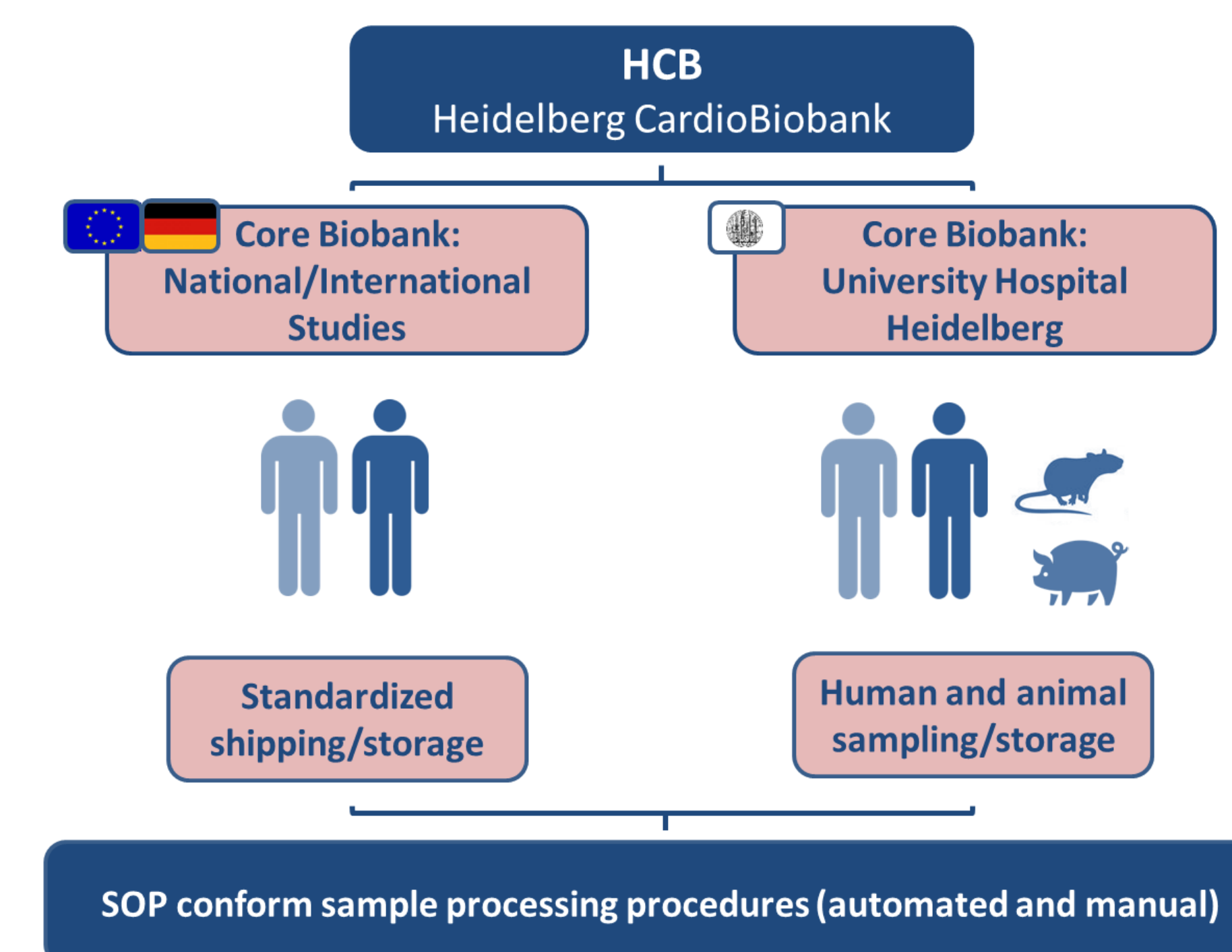


Next Generation Biobanking – Managing multiple requirements in the Heidelberg CardioBiobank (HCB)

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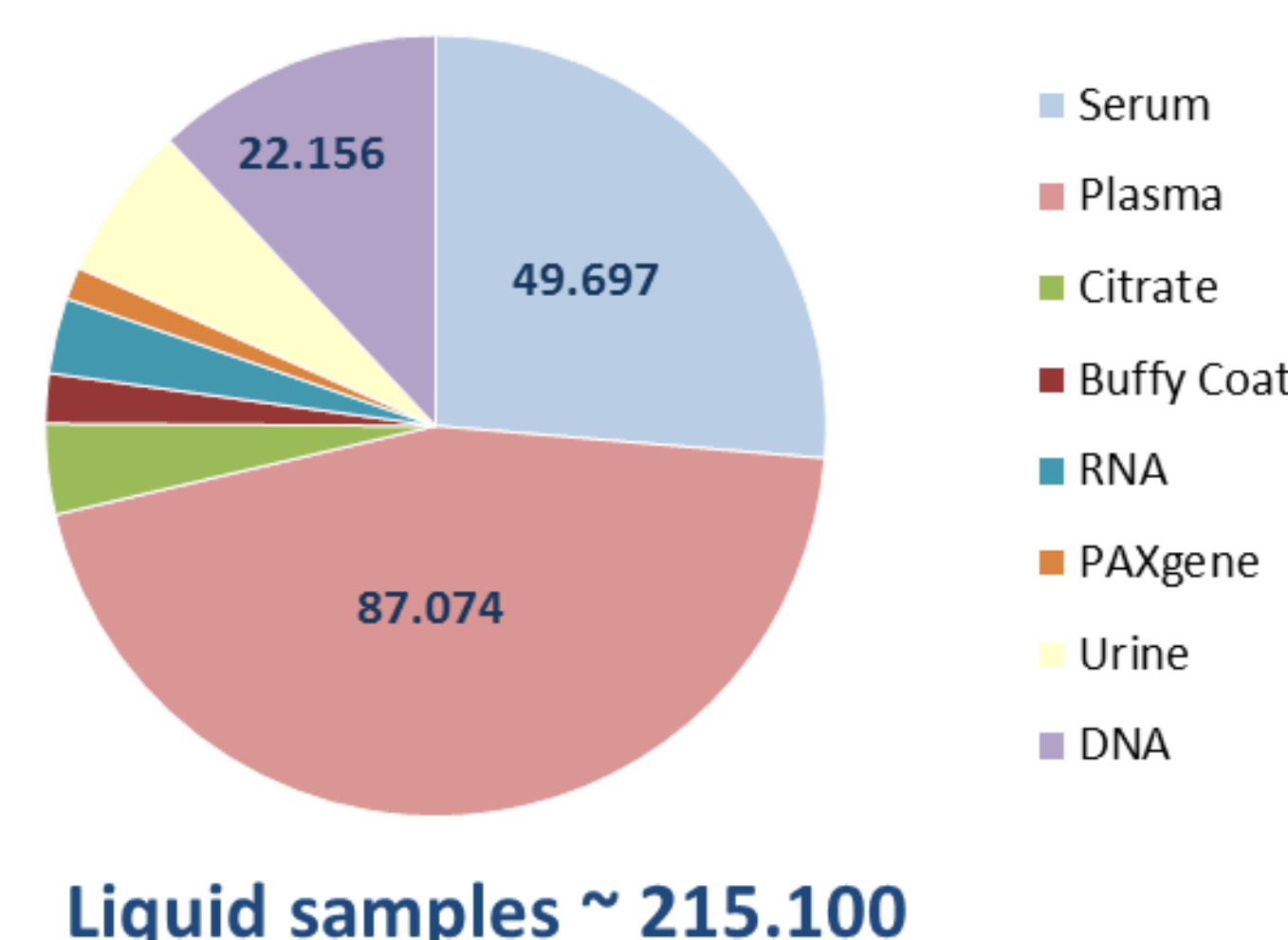
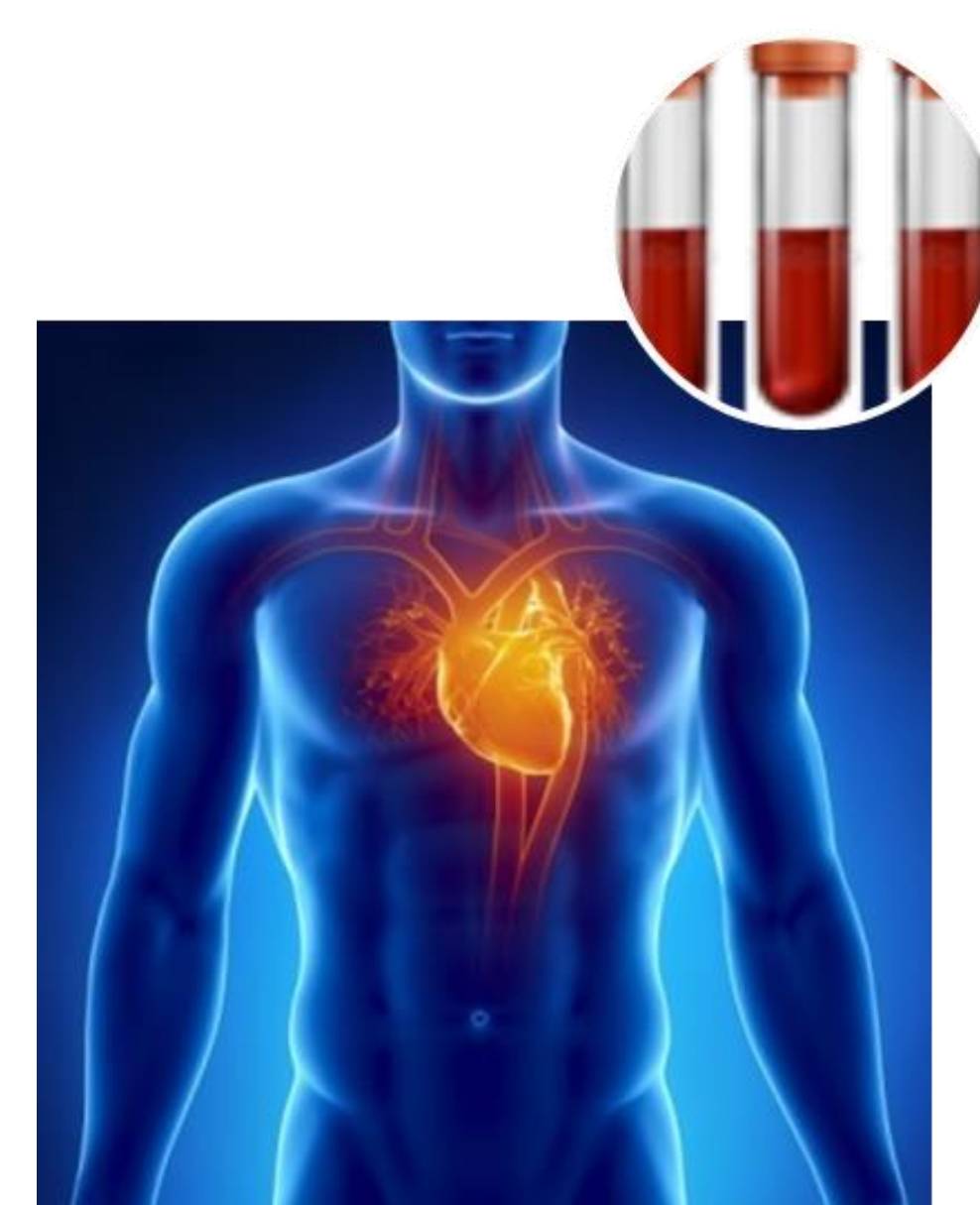
Introduction

In the era of precision and personalized medicine, clinicians and experimental researchers are focusing on analyzing genomics, proteomics and metabolomics of human patients to identify promising therapeutic targets or novel biomarkers. To facilitate this intention, hospitals establish biobanks with collections of biosamples annotated with their clinical data. The Heidelberg CardioBiobank (HCB) operates as a hospital integrated Biobank, mainly for the Department of Cardiology as well as a core Biobank for several national and international studies.



Results

First of all we integrated new applicable and innovative technologies, depending on sample type or study requirements. To reach highest and consistent standards we convert manual sample processing in automated systems. Further Standard Operating Procedures were developed for all preanalytical processes, starting with the collection of biomaterial until their final storage. This resulted in a significant improvement of sample quantity and quality. For data collection, we established an individualized IT- solution using a customized research portal for biobanking and clinical studies named CentraXX (KAİROS GmbH).



Liquid samples ~ 215.100

The Department of Cardiology is one of the largest clinical center in Germany with over 17.000 inpatients and 65.000 outpatients per year. The research focus is on Cardiomyopathies and Heart Failure. Since 2010 we collected more than 215.100 liquid samples. To identify novel targets for the development of new treatment options. We store and provide mainly Plasma, Serum and DNA samples .

1. Project Management
Various studies
One patient in several studies
Data integration (export/import)
Information access

2. Ethics and Compliance
Consent verification
Data protection
Legal requirements

3. Laboratory Operations
Sample processing
Various types of SOPs
Harmonization of tools
Sample storage

Challenges

Solutions

1. LIMS CentraXX
Web-based solution
Information management
Fully integrated study register
Reports

2. SOP
Workflow IC integration
Rights- and roles management
Controlled user access
Education and training

3. Automation
Automated sample processing
(Tecan Freedom EVO® System)
Interfaces to hardware systems
Fully automated storage systems
(customized by Liconic AG)

Conclusions

The introduction of standardized and almost fully automated sample processing systems into the HCB produces the highest quality and integrity of biomaterials which is essential for translational research. The customized CentraXX system facilitates functional data modeling and enables an efficient search between clinical, study and sample related data. Embedding new technologies into the workflows allows the Heidelberg CardioBiobank to be prepared for the future and operates for new and divers clinical studies.