

## Starting Position:

During our high throughput generation of transgenes for *Caenorhabditis*, *Drosophila* and human cells more than 200 000 samples of different steps were created. As it would not have been possible to keep track of our samples and ensure a secure long term storage with a regular freezer, we were forced to build a secure sample storage solution in collaboration with our industry partners.

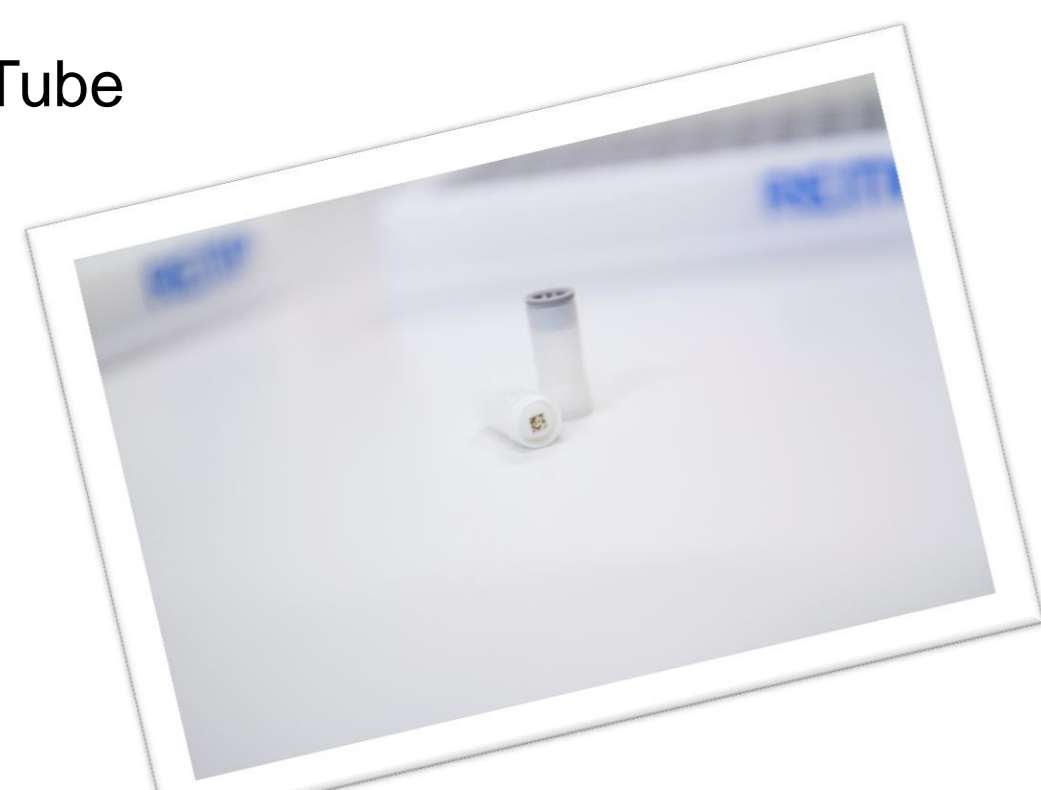
## System requirements:

- Sample storage in individual tubes within 96 well plates
- Automated sample preparation at RT
- Sample storage at -80°C
- Automated hit picking of samples at low temperatures
- Automated tube and plate handling within the -80°C store and at the pipetting area
- Pipetting area and store should run together as well as stand alone

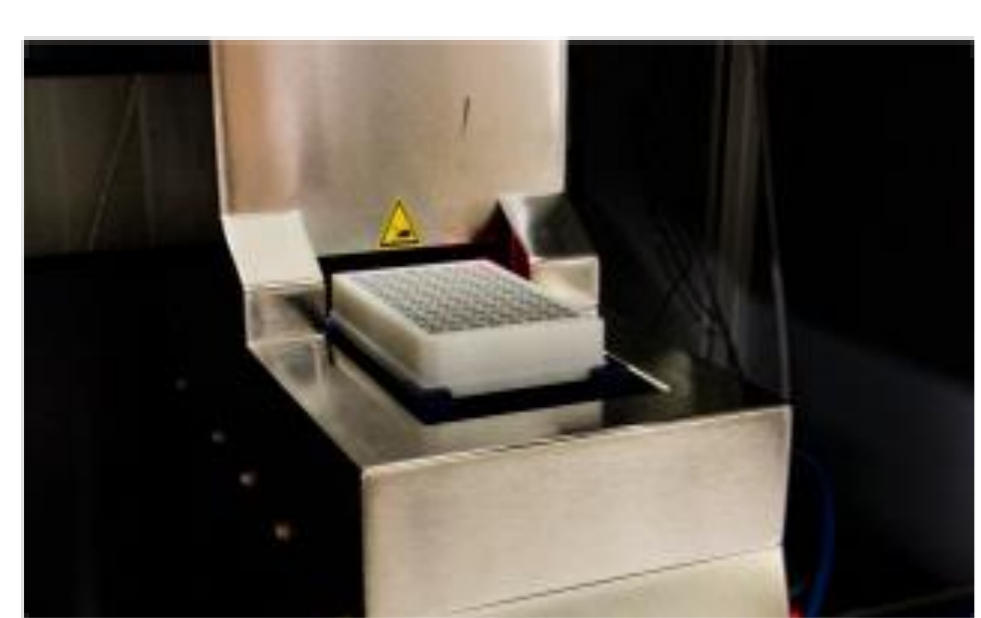
## Solution:

- ✓ Samples are stored in 2D barcoded REMP tubes within 1D barcoded 96 well plates
- ✓ Samples are handled at the Tecan Freedom EVO 200 pipetting station with an 96 head and a LiHA
- ✓ Sample are stored in the LiCONiC STC7K5 Store at -80°C
- ✓ Almost 600 000 samples can be stored at -80°C
- ✓ Between store and pipetting station a LiCONiC -20°C interface with a LiCONiC tube boxer is located
- ✓ Hitpicking is performed within interface at -20°C
- ✓ Pipetting station, interface and store are passing over plates automatically

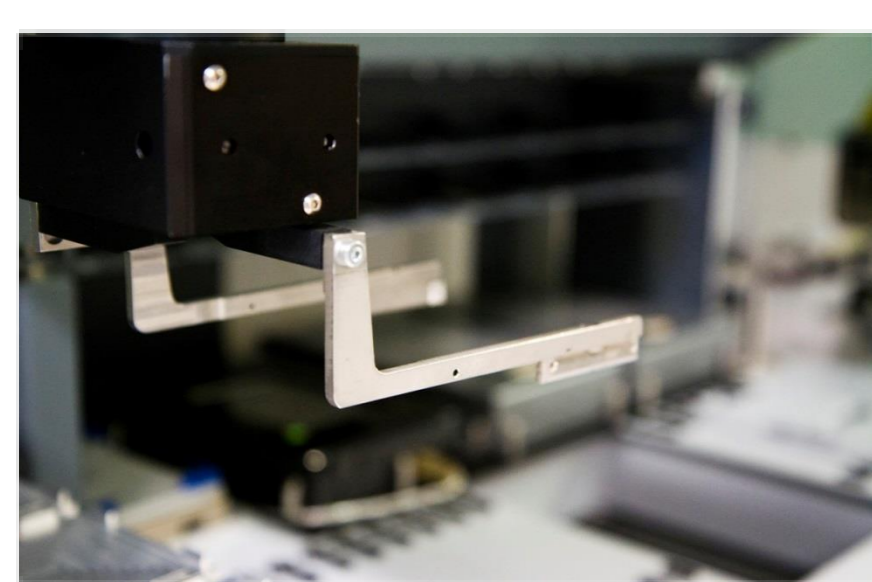
REMP Tube



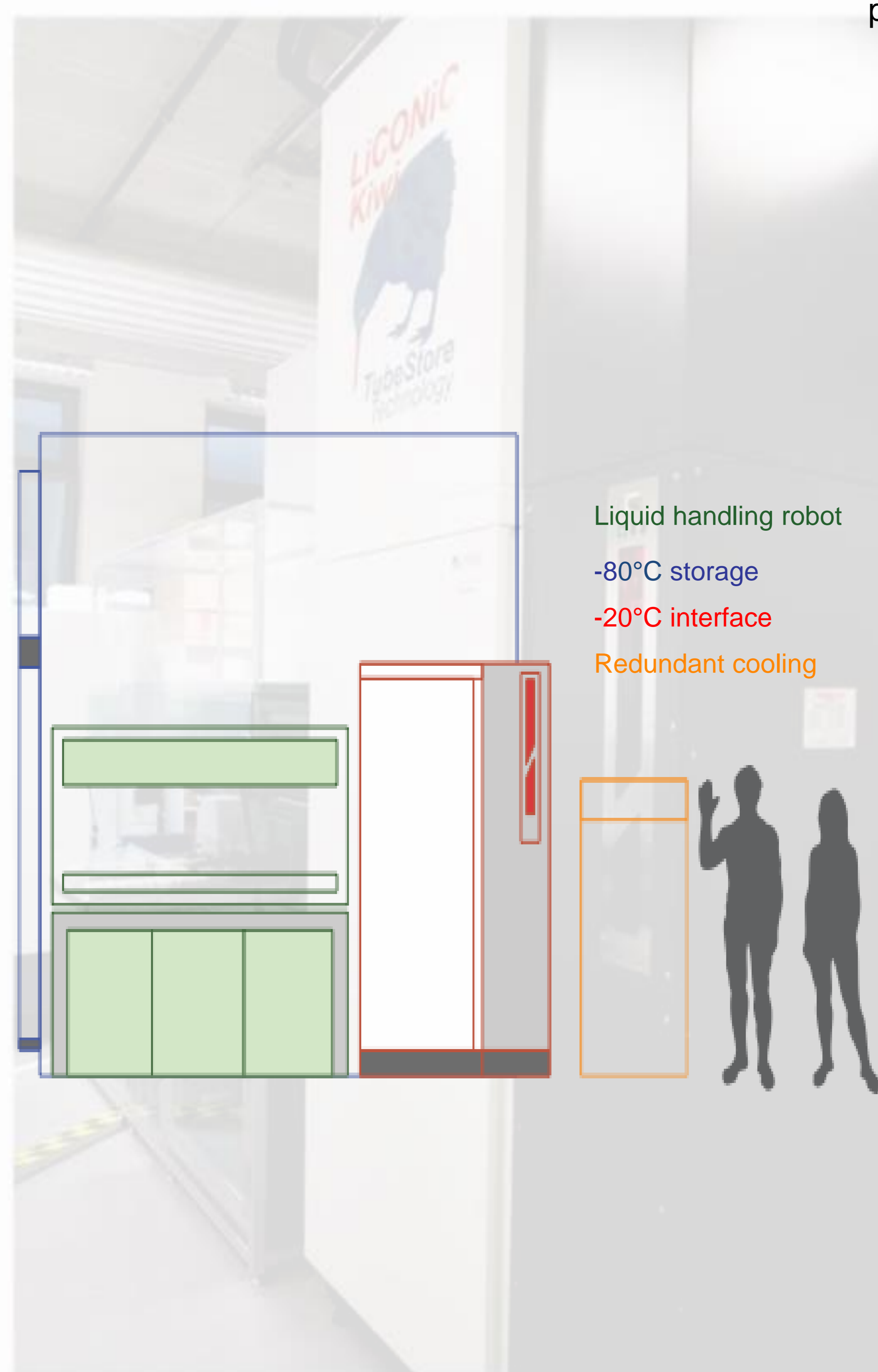
V&P Replicator



REMP Automated Capper/Decapper



Tecan pipetting station with RoMA



Liquid handling robot

-80°C storage

-20°C interface

Redundant cooling



Store from inside With Plate handler



Emergency Access



Redundant cooling

## Automation:

Pipetting station is equipped:

- ✓ Tecan 1D reader, Ziath 2D reader for reading REMP 1D plate code as well as tube 2D code
- ✓ REMP Automated Capper/Decapper controlled by EVOware for removing and adding caps to tubes
- ✓ V&P Scientific Pin Tool Replicator for inoculating media with frozen bacteria

Store is equipped with:

- ✓ Plate handler setting and retrieving plates from store
- ✓ 1D barcode scanner for checking REMP plate code

## Processes running & Outlook:

Already running:

- ✓ *Storing plates with bacteria:* prepare glycerol stock, read 1D and 2D codes, import plates into store
- ✓ *Retrieving tubes and prepare fresh stock:* hit picking of tubes according hit list, retrieval of plates, removal of caps, scraping frozen stock with V&P Scientific Replicator head, inoculation of fresh media, addition of caps, transfer plate to store, pick back of tubes to original position

Planned:

- Validating growth of bacteria and updating LIMS automatically
- DNA prep
- ...

## Security:

- ✓ Daily backup of LiCONiC database
- ✓ Option for 1D inventory of store
- ✓ Redundant cooling
- ✓ Option for flooding store with liquid nitrogen
- ✓ Emergency access to store