# A Next-Generation Open-Source Laboratory Information Management System for Efficient Sample Tracking

_Markus List[1,2,3]_, _Steffen Schmidt[1,2]_ , _Jakub Trojnar[1,2,4]_, _Jochen Thomas[5]_, _Mads Thomassen[1,3]_, _Torben Kruse[1,3]_, _Qihua Tan[3]_, _Jan Baumbach[6]_ , _Jan Mollenhauer[1,2]_

1. Lundbeckfonden Center of Excellence in Nanomedicine NanoCAN, University of Southern Denmark, Odense, Denmark
2. Molecular Oncology, University of Southern Denmark, Odense, Denmark
3. Clinical Institute, University of Southern Denmark, Odense, Denmark
4. Department of Biochemistry and Molecular Biology, University of Southern Denmark, Odense, Denmark
5. io-consultants GmbH & Co. KG, Heidelberg, Germany
6. Department of Mathematics and Computer Science, University of Southern Denmark, Odense, Denmark
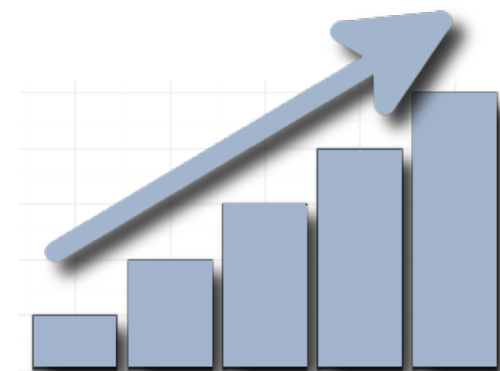
BOSC 2013, July 19th, Berlin

- Growth in experimental throughput

- Teams of researchers

- Several laboratories

- Spreadsheet based solutions insufficient

  ⟹ Challenges for sample tracking

    ⟹ Laboratory Information Management Systems

- Problems:
  - Management of vector clone and cell-line recombinant libraries
  - Existing solutions lack flexibility:

| Modularity | Extendibility | Deployment | Usability |

NanoCAN

OpenLabFramework **A**

Search    Hello admin [Logout]

Gene   Cell Line Data   Attachments   Projects   Storage   Master Data   Barcode   Administration   Settings

**Project Tree**

- Test
- Top Secret

**B**

🏠 Home    📑 Recombinant List    New Recombinant    Delete

## Show Recombinant [My test gene-M1]pDestA

**1**

Genes    My test gene-M1    Remove    **C**

PTEN ▾    Add

Notes    🛠

Projects    *None added*

Test ▾    Add to

Vector    pDestA

**History**    ▬ ✕

Creator        admin
Date Created    2013-05-21 11:48:43 UTC
Last Modifier    admin
Last Update    2013-05-21 11:48:43 UTC

**2**

**Operations**    ▬

M Create new cell line recombinant

**3**

| Attachments | **Storage** |

ℹ There are 0 units left.

You are here:  BigFreezer >> Gateway-1 >> Box1 (Change)

**4**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| A | MCF7 - pAccpt - [PTEN]pDestA - DMEM | MCF7 - pAccpt - [PTEN]pDestA - DMEM - 19/02/13 | MCF7 - pAccpt - [PTEN]pDestA - DMEM - 2 | MCF7 - pAccpt - [ABCD]pDestA - [ABCD]pDestB - DMEM | MCF7 - pAccpt - [ABCD]pDestA - [ABCD]pDestB - DMEM | MCF7 - pAccpt - [ABCD]pDestA - [ABCD]pDestB - DMEM - xx/xx/xx | MCF7 - pAccp [ABCD - DME xx/xx. |
| B | MCF7 - pAccpt - [MyTestGene- | Click to add | Click to add | Click to add | Click to add | Click to add | Click t |

**Addins**

Print Barcode Label

Site                Label  Label ▾
Odense ▾

Description    _____

Text    **D**    |

Scan    📇 Preview

**Attachments**

Upload a file

LEGEND

W: Wildtype
M: Mutant
P: Promotor
C: cDNA derived
F: Gene Fragment
K: Knockdown (Silenced)

![OpenLabFramework — University of Southern Denmark]

# Modularity

**Backend**

- GeneTracker Module
- Storage Module
- File Attachments Module
- Barcoding Module
- Frontend
- ?

# Extendibility

**Backend**

MasterDataObject
- ...
- Cell-Line
- Vector

DataObject
- Cell Recombinant
- Gene
- Gene+Vector
- ...

**GeneTracker Module**

- Freezer
- ...
- Storage Element
- ...

**Storage Module**

# OpenLabFramework
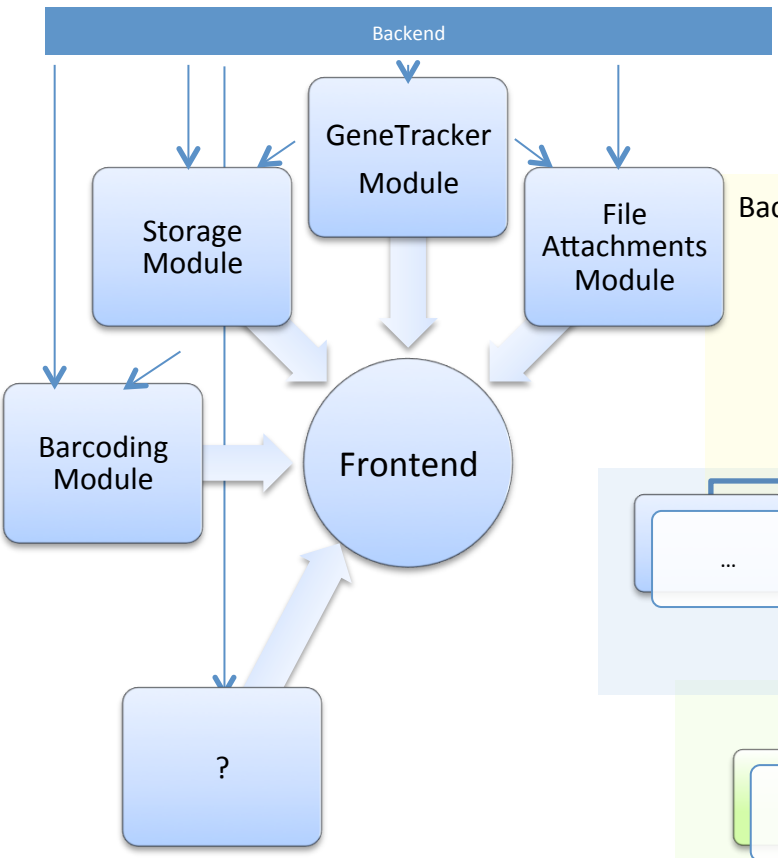
**Deployment**

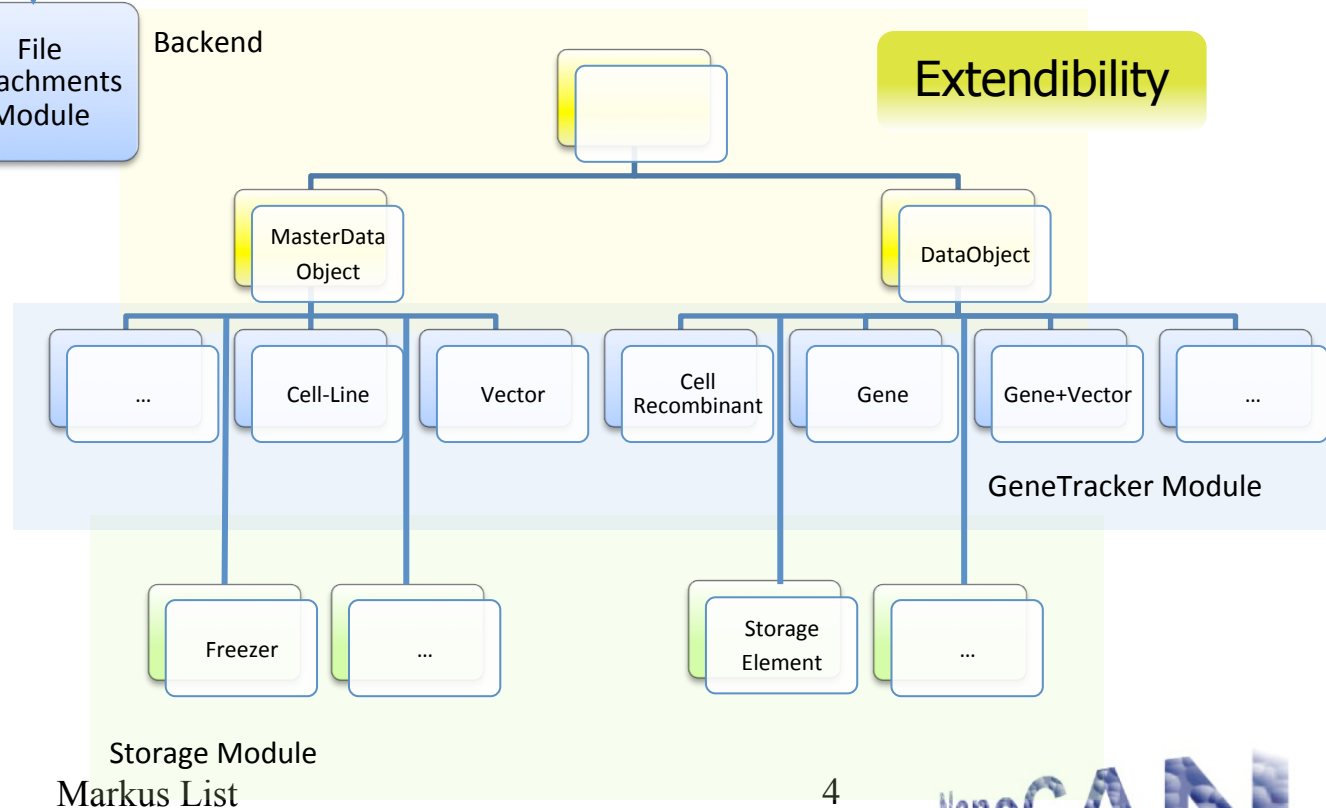**Usability**

## Database
- File
- JDBC:
  - MS-SQL
  - PostgreSQL
  - MySQL/MariaDB
- Non-SQL:
  - MongoDB
  - ...

## Installation
- Local
- Server
  - Tomcat
  - Glassfish
  - ...
- Cloud
  - CloudFoundry
  - eApps

## Documentation
- Online Wiki
  - Users
  - Administrators
  - Developers

## Excess Values / Productivity Features
- QR Barcodes
- Label Printing
- Document Management
- Export
- Mobile Views

Syddansk Universitet
UNIVERSITY OF SOUTHERN DENMARK

NanoCAN

Thank you for
your attention!

# OpenLabFramework

Acknowledgments

- The entire NanoCAN Team

- Special thanks to
  - Jan Mollenhauer
  - Jan Baumbach
  - Qihua Tan
  - Jochen Thomas

LUNDBECKFONDEN

A. P. Möller og Hustru
Chastine Mc-Kinney Möllers Fond til almene Formaal

OTICON FONDEN

Region Syddanmark

eagle

O|B|F

NanoCAN