

# Delivery of Federated Trusted Research Environments

Thorben Seeger

Nordic Biobank Conference 2022



# Delivery of Federated Trusted Research Environments

for collaborative, secure analysis  
of distributed clinico-genomic data

Nordic Biobank Conference: Gothenburg, Sweden



Thorben Seeger  
Chief Business Development Officer





Deep clinico-genomics

# Data

is the answer to...

biomarker discovery  
drug development  
patient stratification  
precision medicine

Genomic  
Data

Multi-omics  
Data

Clinical  
Variables

Phenotypic  
Variables

Annotations

EHR Data

Real-World  
Data

Imaging  
Data

Sensor Data



# Data saves lives



## Faster disease diagnosis

**5x** more rare  
disease patients get  
accurate diagnosis

## Drugs with genetic evidence

**2x** more likely  
to be approved

## Understand diseases better

**5** genetic markers  
found to influence  
COVID-19 severity

**Data saves lives**



# Connecting data is critical!

More Data can lead to exponential increase in findings

disease patients get  
accurate diagnosis

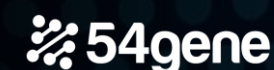
**10x** samples ~ **100x** results



# Good news

The data is out there!

200+  
data custodians



Vast amounts of Real-World Clinico-genomic Data  
is being generated by Healthcare Providers, Biobanks,  
Pharma & Academia worldwide

Genomic  
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Sensor Data



# The bad news...

ACADEMIA

BIOBANKS

**97%**  
of that  
sensitive data  
is inaccessible  
& unusable

PRIVATE  
DATASETS

PUBLIC  
DATASETS

Genomic  
Data

Clinical  
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EHR Data

Multi-omics  
Data



# Precision Medicine Has hit a Wall

Moving biomedical data into a centralised environment is **no longer feasible**  
Obtaining usable data is therefore difficult



Today's data  
is too large



Loss of control over  
precious data



Regulatory  
restrictions

ACADEMIA

BIOBANKS

**Fragmented  
Data**

PRIVATE  
DATASETS

PUBLIC  
DATASETS

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Data



# Solution: Analyse data in-situ

Federation allows sensitive data to be accessed and connected **without moving it!**

**It stays in the data custodian's environment**

- ✓ **Security by design**
- ✓ **Stay in control of your data**
- ✓ **Link data globally**

## Federated Analysis

ACADEMIA

BIOBANKS

PRIVATE DATASETS

PUBLIC DATASETS

Genomic Data

Clinical Variables

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# Enabling Life Changing Insights for **Genomics England**

- ✓ Faster Diagnosis for Researchers
- ✓ Novel insights for **Global Pharma**





# UK Government Case Study

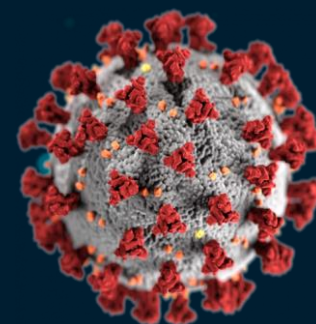
Lifebit is central in their fight against cancer & COVID-19





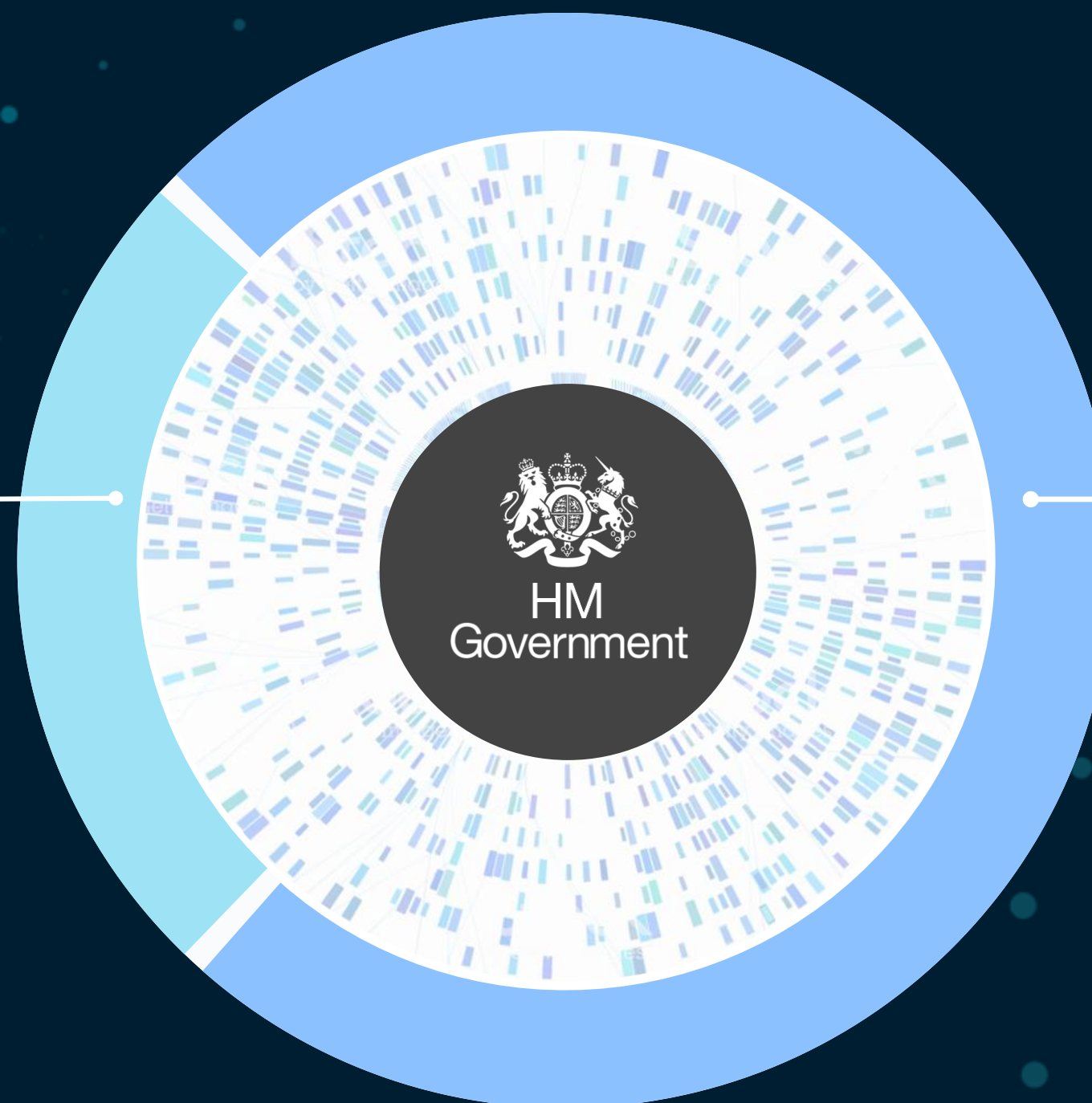
# An unprecedented cohort

Lifebit is central in their fight against cancer & COVID-19



**35,000**

WGS + EHR of **COVID-19**  
patients from 230 hospitals



**100,000**

WGS + EHR of **cancer  
& rare disease** patients  
from all UK hospitals



# Highest security but low usability

Genomics England (like all biobanks) struggled to find the balance



**Researchers**



**Connected Cohorts**



Data siloed  
& hard to  
access

Limited  
tools for  
analysis

Data  
cannot be  
connected





# Security and usability

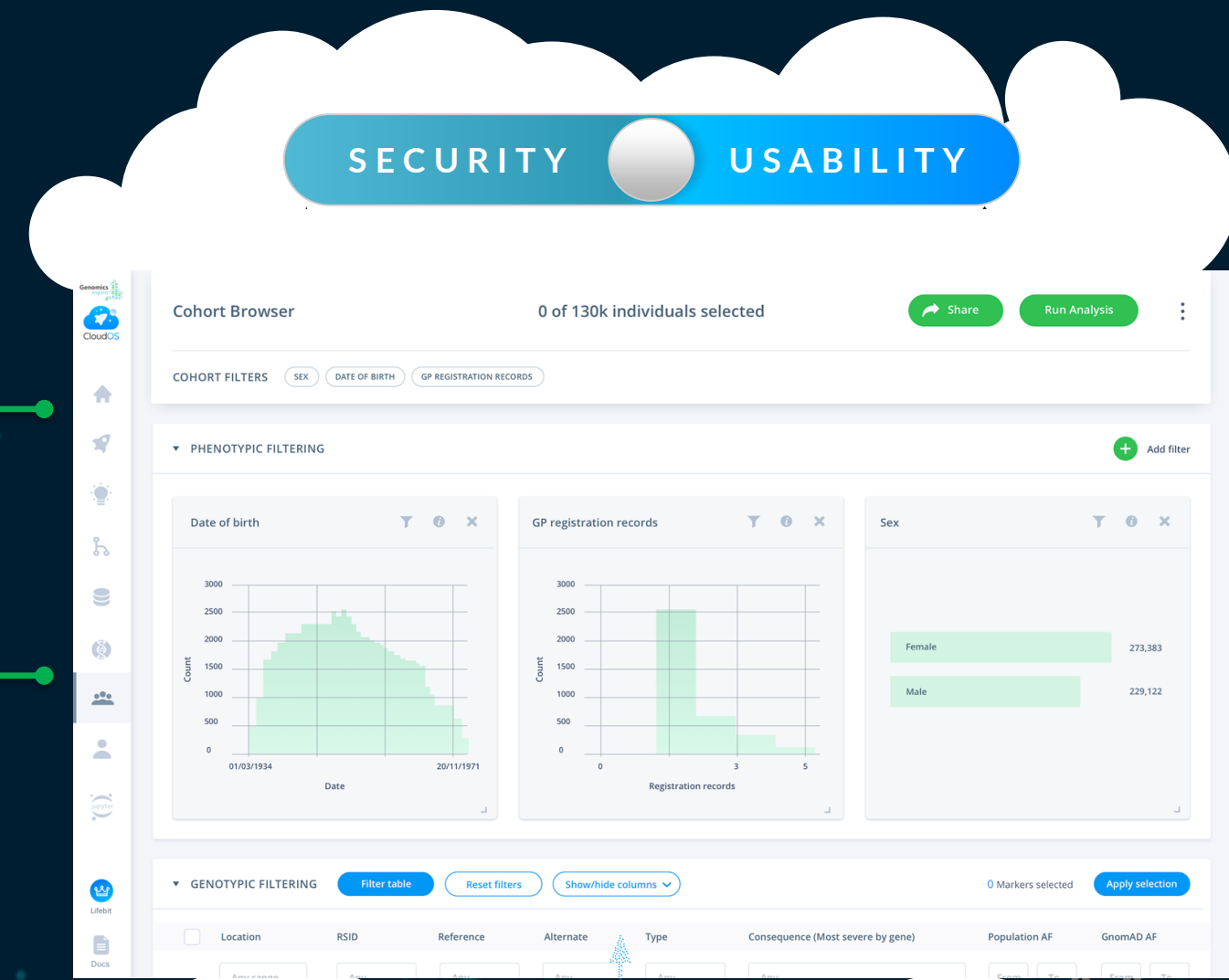
Federated technology achieves both for the first time



## Researchers



## Connected Cohorts





# Better research

Researchers access & analyse the data easily



## Researchers

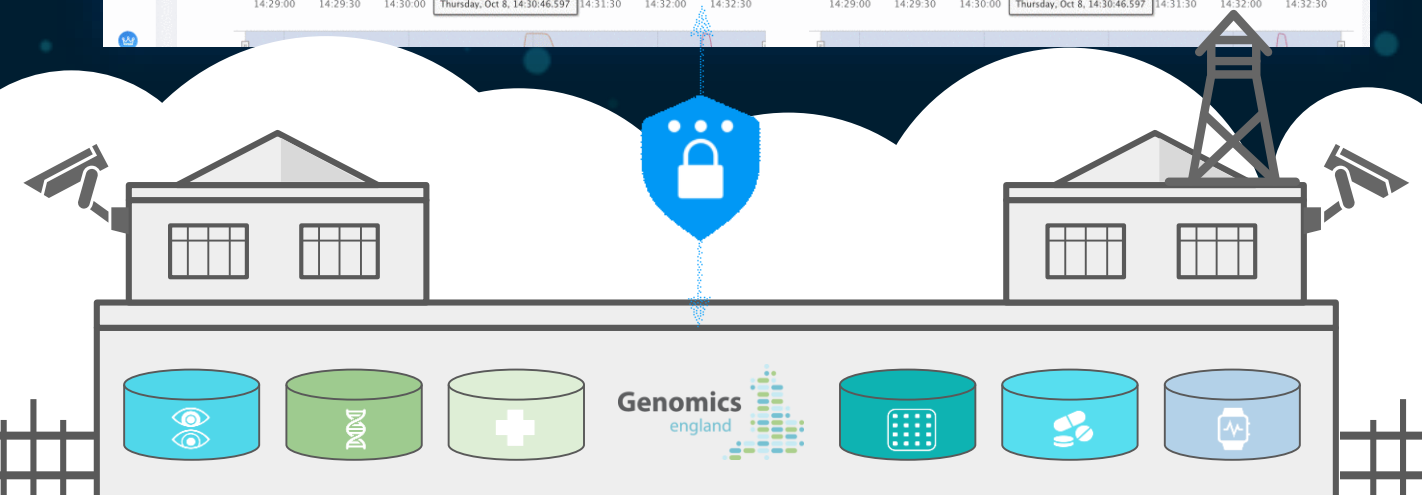
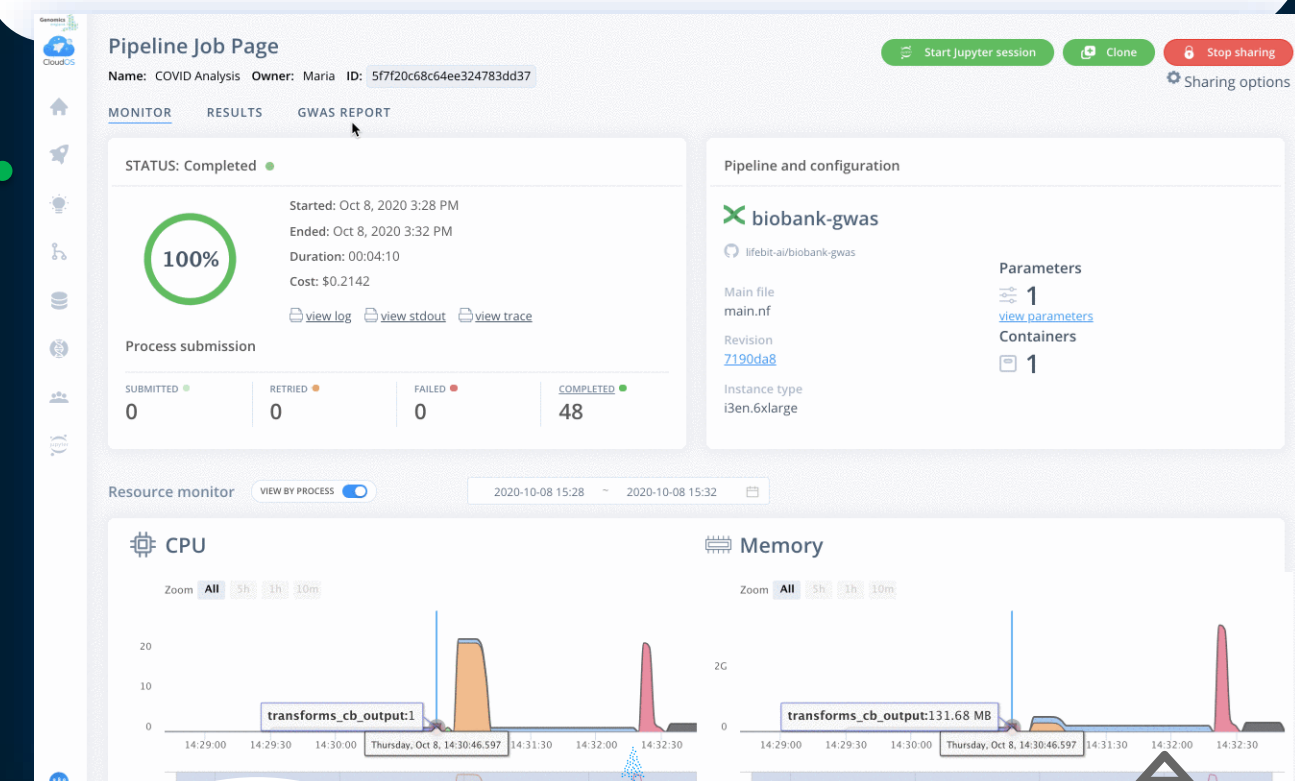
Enabled to Obtain Novel Insights



## Connected Cohorts

SECURITY

USABILITY





# Joint data drives more insights

Connect the world's distributed biomedical datasets



**Researchers**



## Connected Cohorts

Combine And Maximize Data  
– from Pharma and Biobanks





# Genomic Research Today



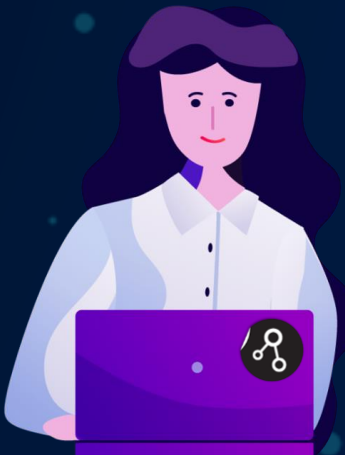


# Genomic Research Today



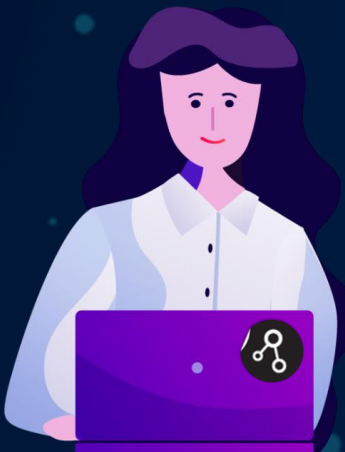


# Genomic Research Today – Siloed





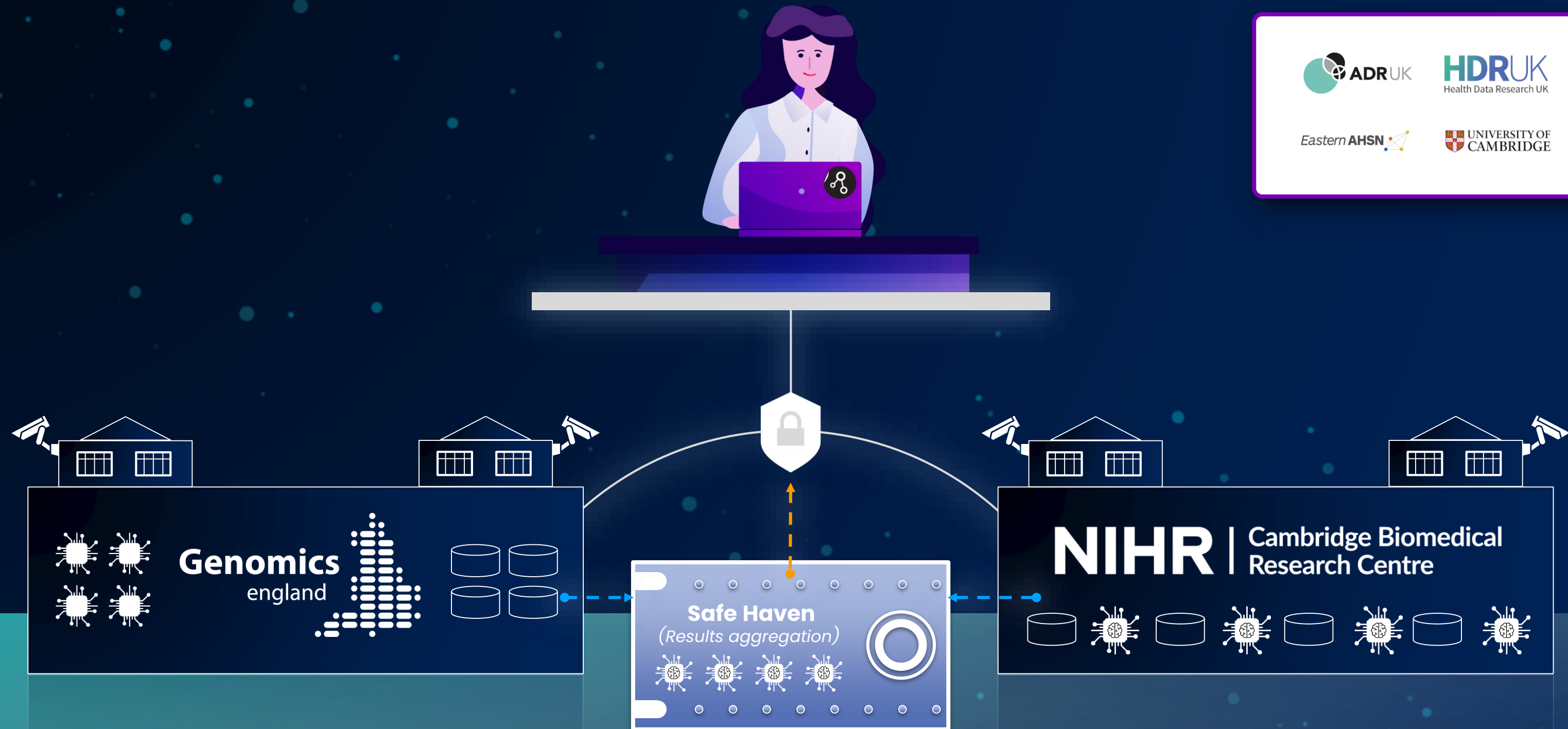
# Next-Generation Genomics Research



This work is supported by UK Research & Innovation Grant Number MC\_PC\_21026 as part of Phase 1 of the DARE UK (Data and Analytics Research Environments UK) programme, delivered in partnership with HDR UK and ADRUK.



# Where results meet





# Connecting the world of precision medicine



# Boehringer Ingelheim: Industry Embracing Federation



## INDUSTRY NEWS

### Boehringer Ingelheim and Lifebit announce partnership to capture transformation value of health data

Ingelheim, Tuesday, 03/01/2022 - 07:00

- Boehringer Ingelheim partners with Lifebit Biotech, Ltd. to build a scalable data, analytics and infrastructure platform
- This collaboration aims at capturing translational disease insights from large external healthcare biobanks and maximizing value of data for drug discovery and precision medicine



#### Dr. Jan Nygaard-Jensen

SVP, Global Head of Computational  
Biology and Digital Sciences  
Boehringer Ingelheim

“ This platform will play an important part of Boehringer Ingelheim’s broader strategy to capture **translational disease insights** from large external healthcare biobanks and ultimately to accelerate the development of innovative medicine ”

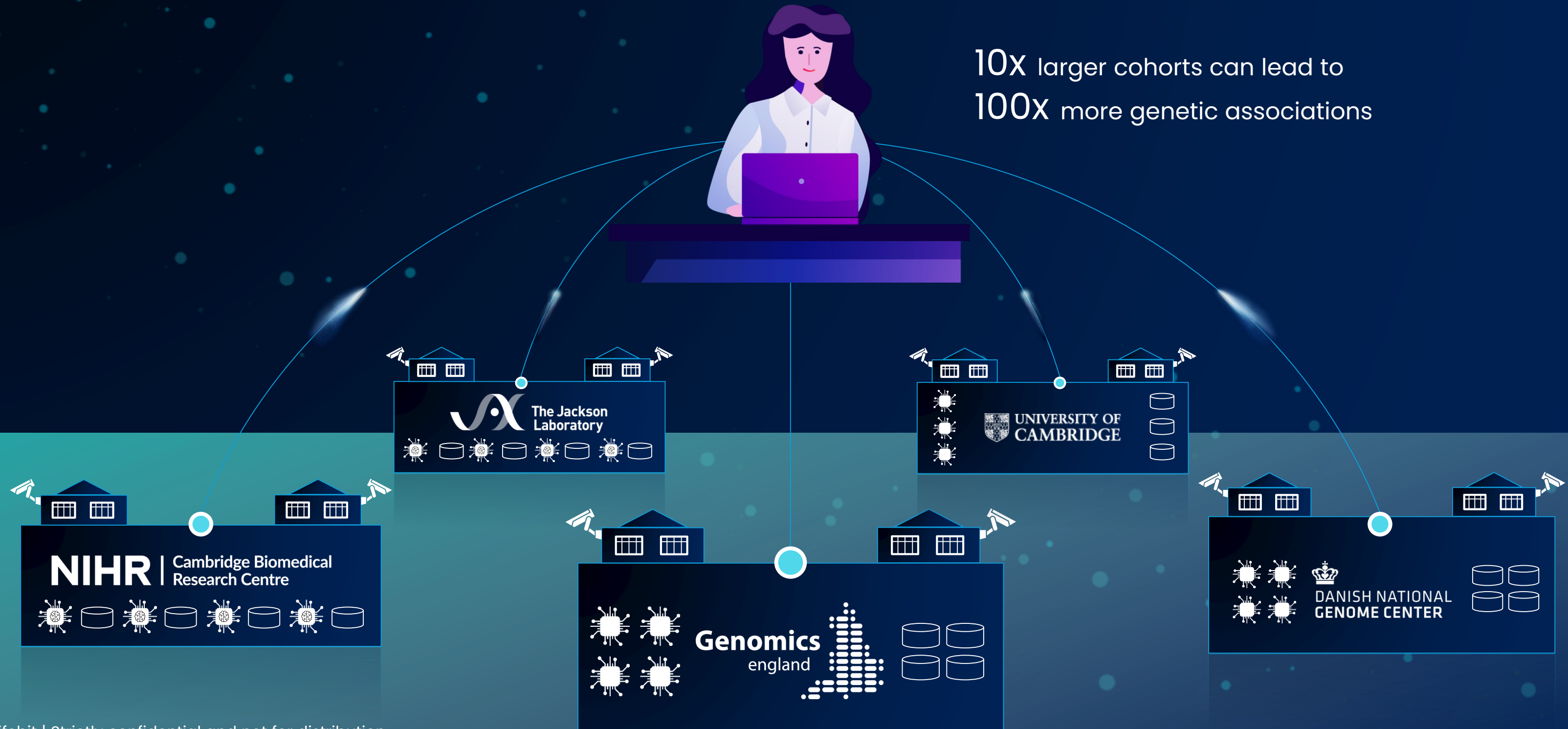


# Connected Cohorts

## Joint Querying & Analysis = More Findings



10X larger cohorts can lead to  
100X more genetic associations



# An era of connected data







**Thank you**  
*Get in touch!*

[hello@lifebit.ai](mailto:hello@lifebit.ai)





# NORDIC Biobank Conference



## Theme: Next Generation Biobanking

A unique opportunity to meet representatives in the area of human biobanking as well as other scientific experts from healthcare, academia, and industry.

Webbpage and registration: [nbc.biobanksverige.se](https://nbc.biobanksverige.se)

The Nordic Biobank Conference 2022 is jointly organized by the Nordic countries, comprised of Denmark, Finland, Iceland, Norway and Sweden.