



# INFORMATION ABOUT THE DANISH NATIONAL BIOBANK

# The Danish National Biobank initiative

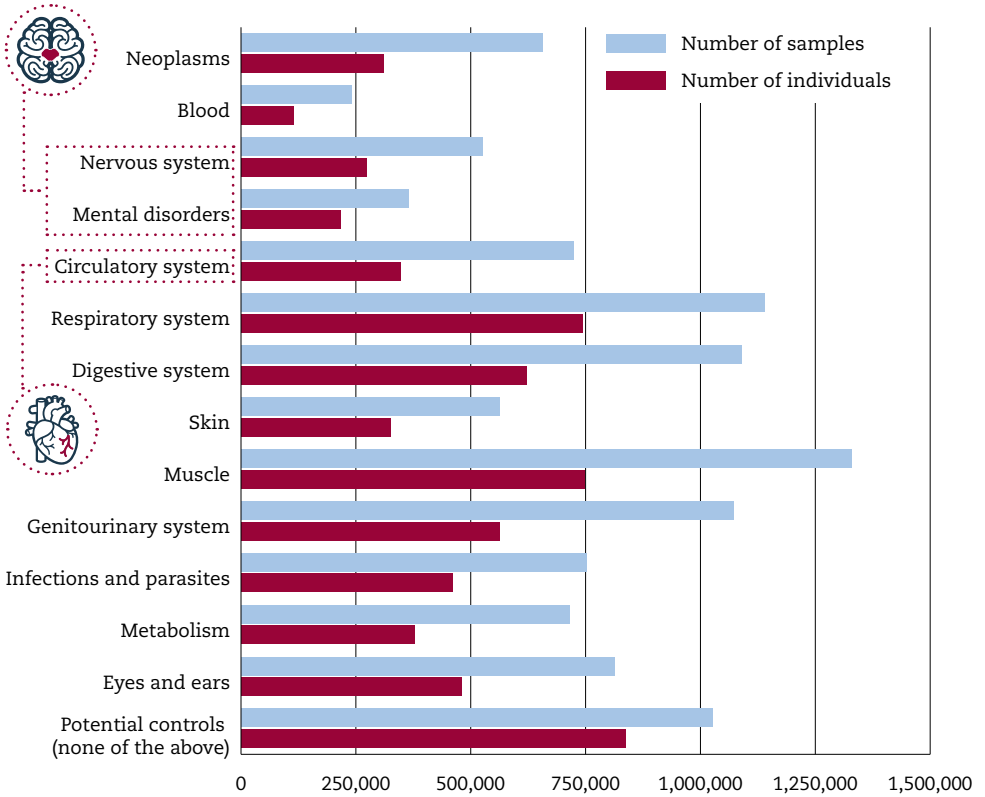
A physical biobank containing more than 12 million biosamples across an array of diagnostic categories; the Danish Biobank Register that links over 27 million biosamples in Danish biobanks to vast amounts of register information; and the Coordinating Centre that secures smooth sample access. Together they constitute the DNB initiative, and represent unique possibilities in human life science research.



- An unbiased sampling of the Danish population such as the PKU blood samples from all newborns since 1982
- Samples from more than 800,000 potential controls
- Uniquely, sample groups link to vast amounts of donor information in the Danish registers - e.g. medical history, school performance, place of living etc.
- Highly automated workflows mean unmatched speed, very low error rate and complete logging



Biological samples in the Danish National Biobank	Samples	Individuals
Serum	3,317,536	951,521
Dried blood spot samples (DBSS)	2,565,821	2,091,587
Plasma	1,488,350	442,752
Whole blood	830,524	320,872
DNA	678,237	451,455
Buffy Coat	346,033	126,527
Urine	320,456	126,054
Saliva	90,407	42,554
Red blood cells	85,349	41,738
Amniotic fluid	66,407	56,505
Cord Blood Mononuclear Cells	65,032	65,032
Proteins extracted from DBSS	39,168	38,979
Spinal fluid	28,596	16,498
Other (PBMS, faeces, stem cells, biopsies, etc.)	83,430	49,040

# Samples and donors sorted by diagnostic categories



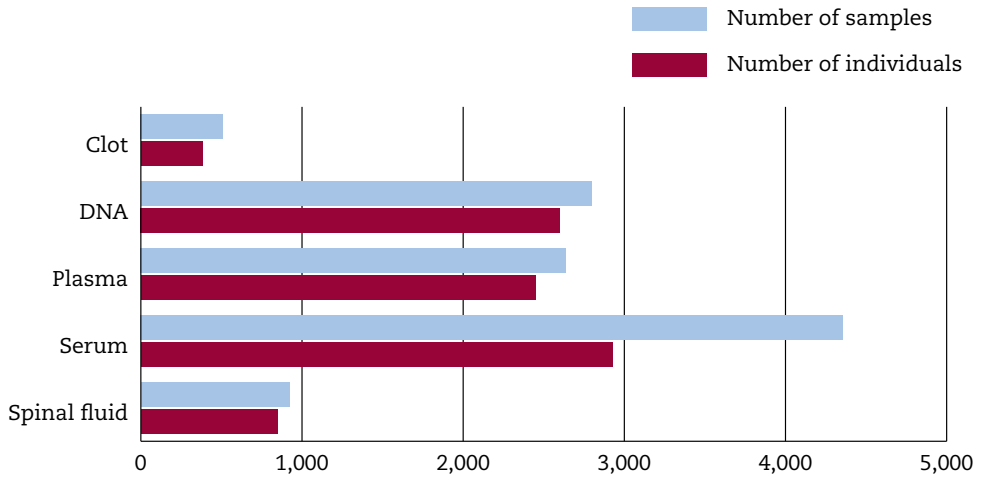
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**Case 1: Alzheimer's disease** results in failing brain function, dementia and ultimately death of millions globally every year. (ICD8: 29010, ICD10: DF00, DG30)
- 
**Case 2. Ischemic heart disease** is the cause of more deaths globally than any other disease. (ICD8:410-414, ICD10:DI20-DI25)

The two selected cases display some of the research possibilities within the DNB in different research fields. Both examples are important diseases, devastating to those afflicted, where much research is yet needed in order to understand and ultimately treat successfully. The next pages will give an overview of relevant samples, individuals and timeframes.

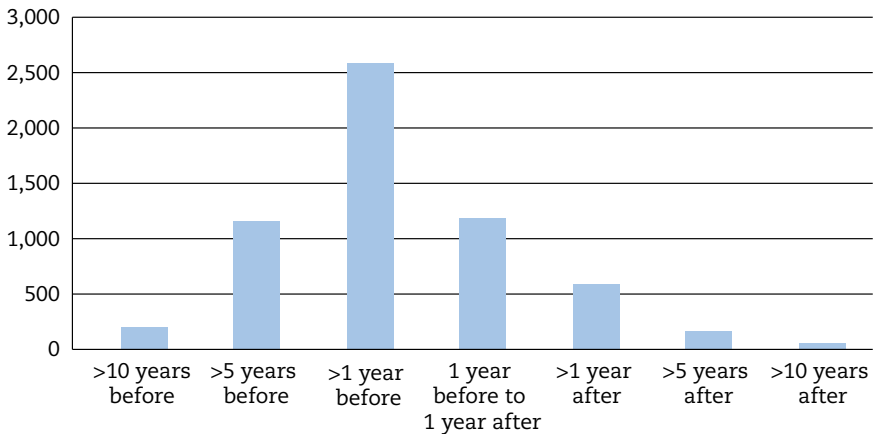
# Selected diseases and corresponding biological samples in DNB

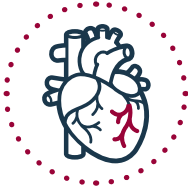


## Case 1: Alzheimer's disease

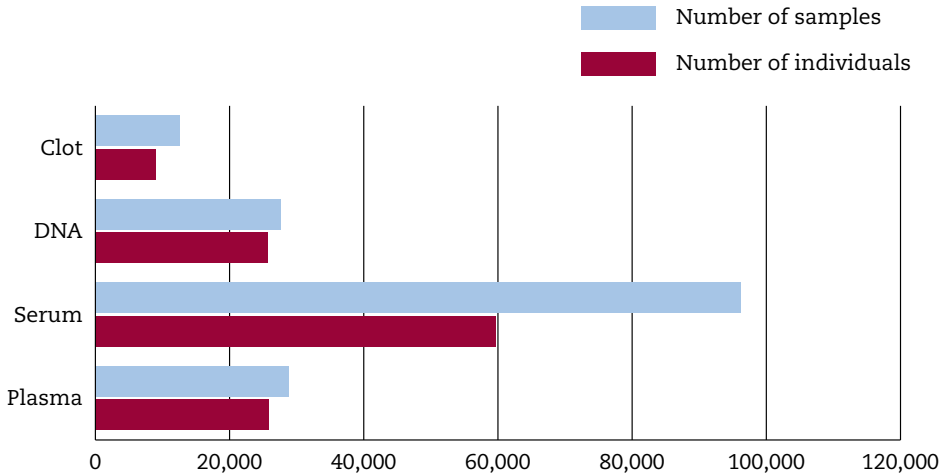


## Serum sample distribution relative to time of diagnosis

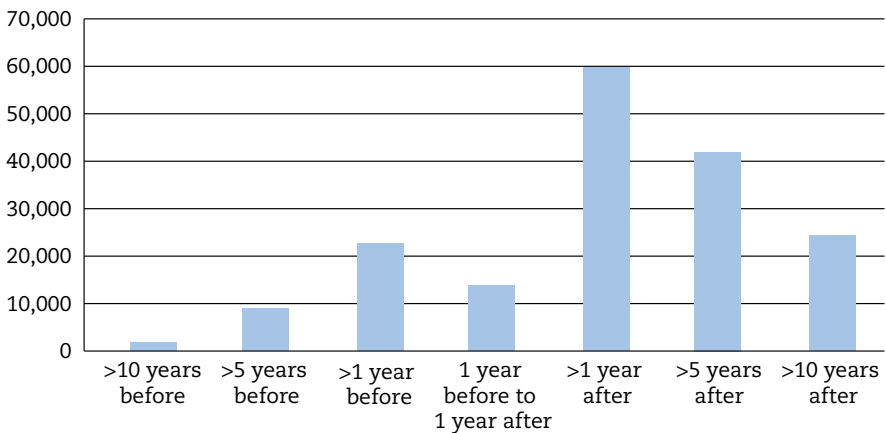




## Case 2: Ischemic heart disease



### Serum sample distribution relative to time of diagnosis



## Find samples with the Danish Biobank Register

The Danish Biobank Register is an online tool that gives researchers a grand overview of more than 27 million biological samples in participating Danish biobanks.

Furthermore, the system is able to link the biological samples to register information from the Civil Registration System, the National Patient Register, and the Pathology Register.

This means that a scientist interested in e.g. breast cancer can search using the diagnosis code DC50 and find available biological material. Searches can be made for samples taken at the time of diagnosis, but also many years before the disease manifests itself, allowing new early biomarkers to be discovered. The Danish Biobank Register is a unique tool for initiating new research projects.



On the DNB website you can find an introductory video to the register and a thorough video tutorial. Go to [danishnationalbiobank.com/danish-biobank-register](https://danishnationalbiobank.com/danish-biobank-register) to watch the video.

# Danish Biobank Register

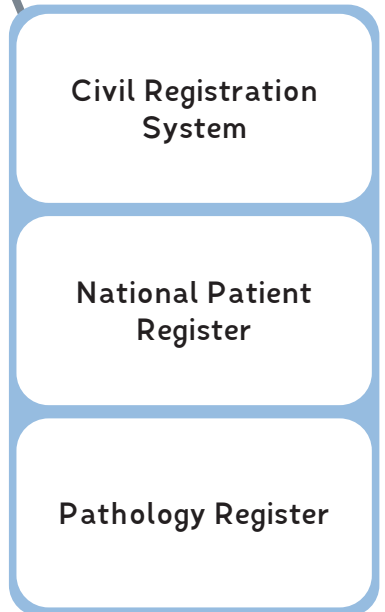
27.4 million samples from 5.9 million people



## Biobanks

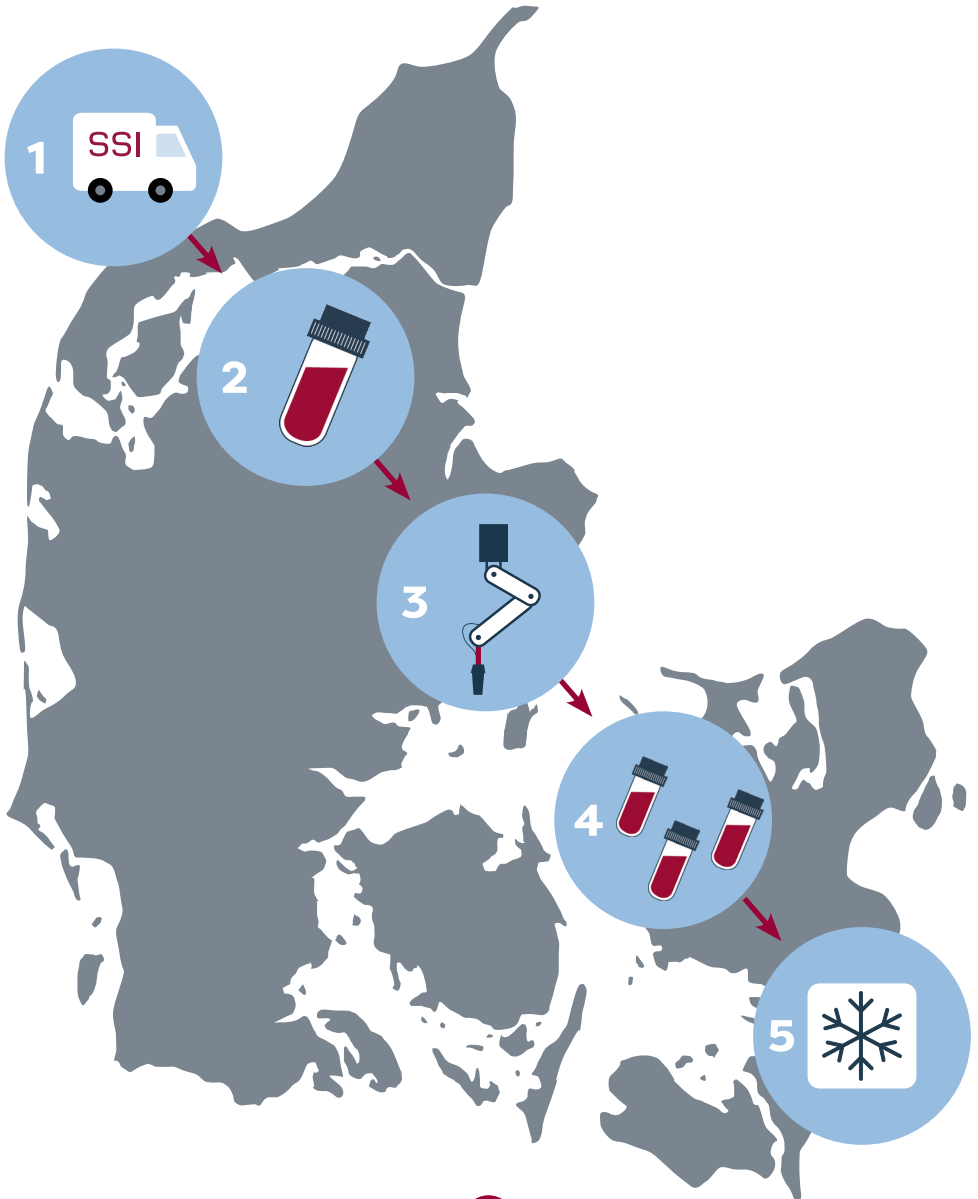


## Registers



## Sample collection

Samples are collected regularly throughout the country and taken to the biobank. Here they are handled by skilled specialists and advanced robots, redistributed into smaller aliquots, and brought swiftly to automated storage.





# Biomarker analysis at Statens Serum Institut



## DNA purification

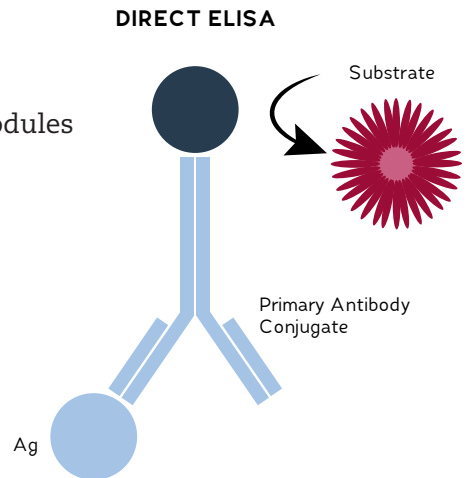
- 1200 samples/day
- One-step concentration determination and normalisation

## Genetic analysis

- Genomics
- Epigenomics
- Transcriptomics

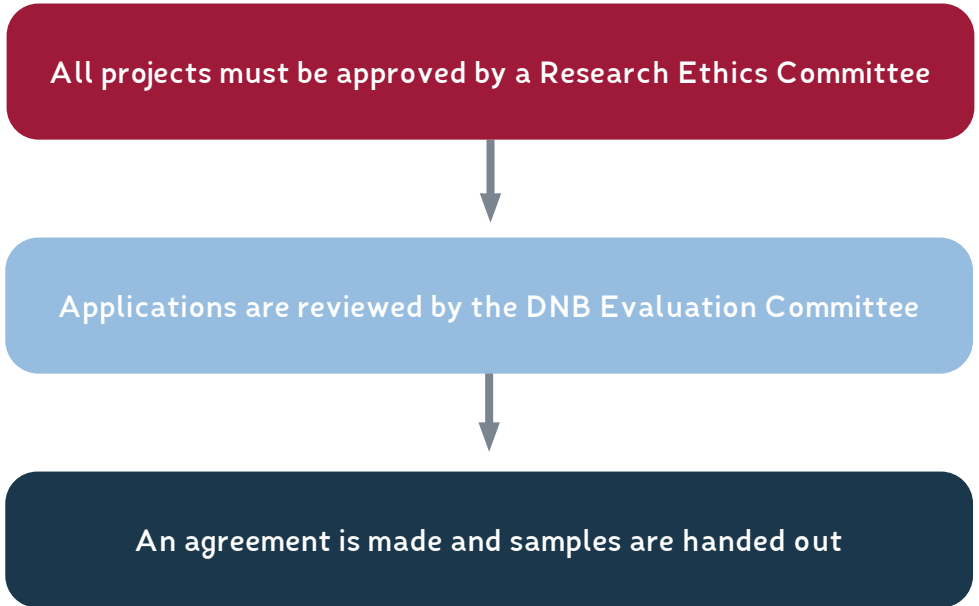
## Biochemical analysis

- 6000 samples/day
- More than 300 biomarkers
- Immunological and biochemical modules
- Runs >100,000 tests/year



## Access to biological samples

Sample retrieval from the Danish National Biobank requires approval from a Danish health research ethics committee. Approved projects are then reviewed by the DNB Evaluation Committee. Upon successful evaluation, samples are retrieved and handed out to the researcher.



Go to [danishnationalbiobank.com/access](https://danishnationalbiobank.com/access) to get a complete walkthrough.

## DNB as collaborator in new studies

The DNB offers help and advice for new studies. We can assist with study design, sample handling, registration, transportation, analysis and storage. Since all processes are performed in-house, there is a very short time from donor to biobank freezer, maximising sample quality. Further, since data can be exchanged live, results are returned as soon as the samples are analysed.

## Why collaborate with the Danish National Biobank?

- Because we have great expertise in sample registration, handling, storage and analysis
- We have some of the world's most advanced, secure and monitored systems
- We collaborate with Danish and international experts in development and optimisation of biobanking



## Aims to strengthen research

The formation of the Danish National Biobank (DNB) was made possible by a major financial contribution from the Novo Nordisk Foundation and by financial support from the Lundbeck Foundation and the Danish Ministry of Science, Innovation and Higher Education.

The main goal of the DNB is improvement of public health by strengthening Danish public health research and international research collaborations.

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# Unique research opportunities

27 million biosamples for research

representing an unbiased sampling of the Danish population

linked to vast amounts of donor information in the Danish registers

Automation: unmatched speed, very low error rate and complete logging

