



**BBMRI-ERIC**

Biobanking and  
BioMolecular resources  
Research Infrastructure

## Belgium

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TMF-Workshop "National Biobank Registers"  
Berlin, Germany, 18 February 2015

# Overview of the Belgian Biobank registries

BBMRI.EU

BBMRI.BE

 **BWB**

  
Belgian Cancer Registry

THE BELGIAN VIRTUAL  
TUMOUR BANK

**CMI**  
Center for Medical Innovation

# 1. The Belgian Virtual Tumourbank (BVT)

a project of the Belgian Cancer Registry



Belgian Cancer Registry

THE BELGIAN VIRTUAL  
TUMOURBANK

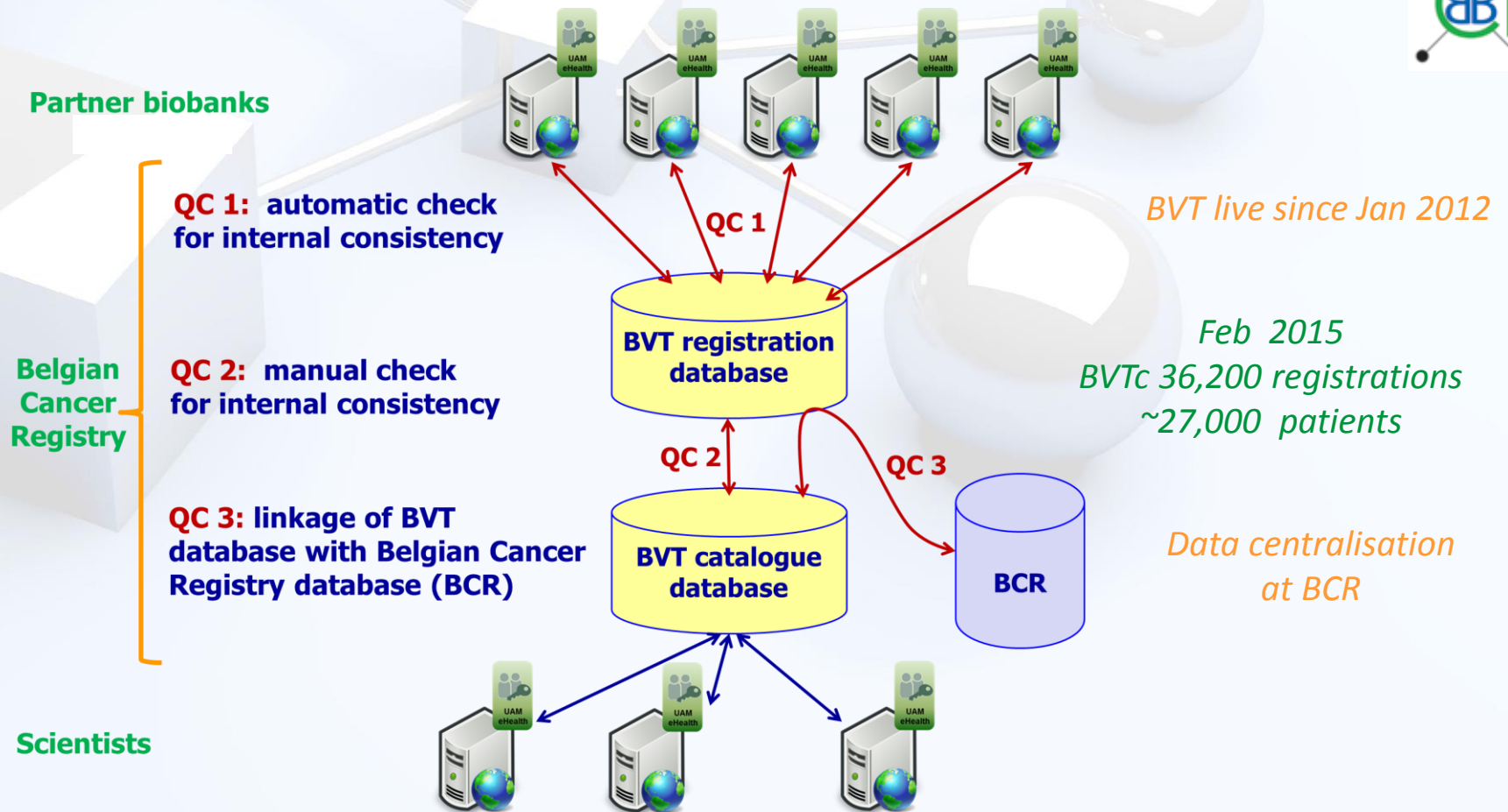
# BVT: Aims & Focus



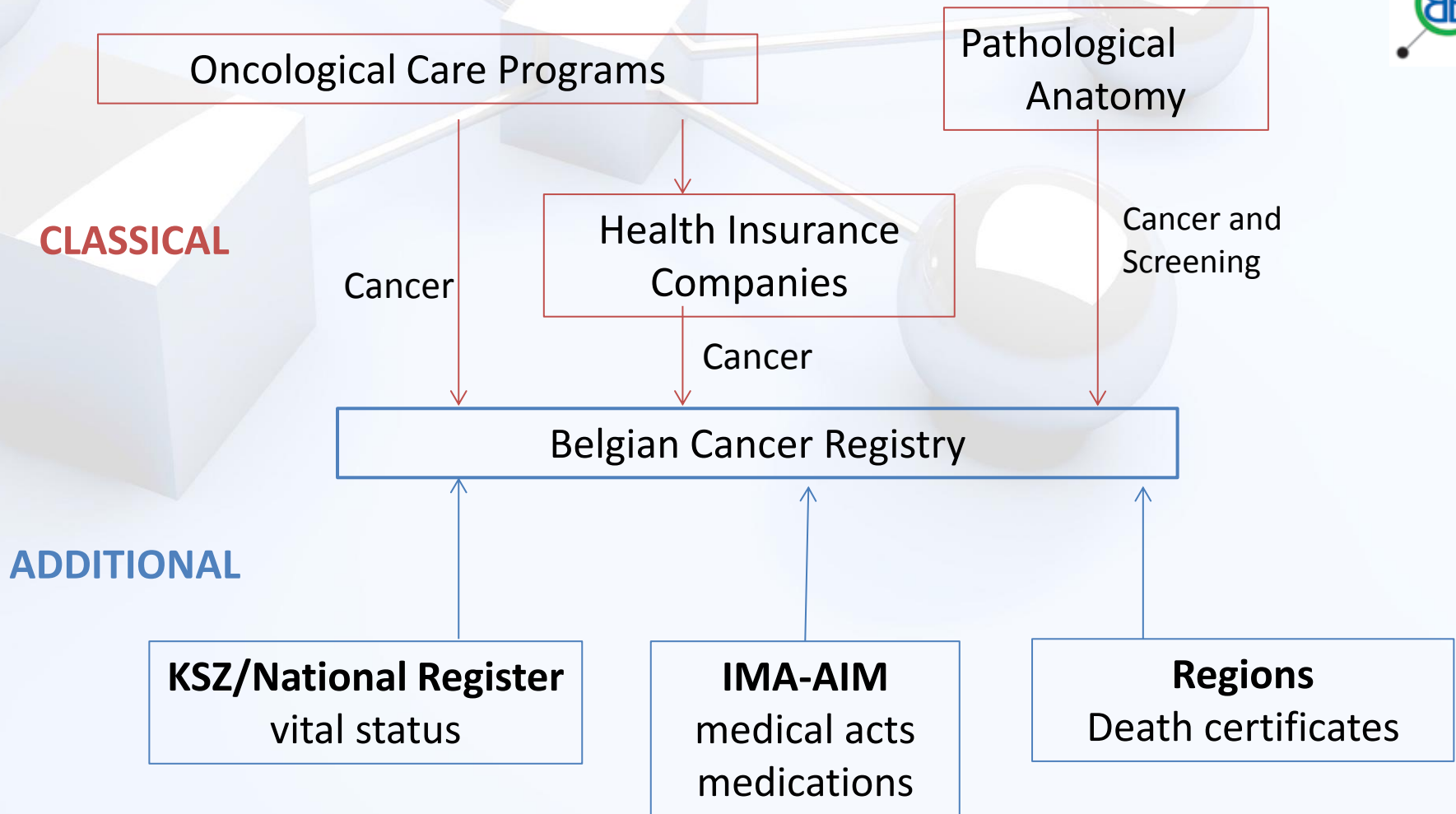
- Aim: to centralize the nationwide data of residual human tumour samples in a database
- Possibility for researchers to search/query the coded database.
- Data available from 11 hospitals
- Focus: clinical biobank
- Funded by the Belgian Ministry of Public Health (Cancer Plan)



# BVT: Organisational Scheme



# BVT: connection to Public Health



# BVT: Dataset : part 1



Variables in the BVTr	Variables in the BVTc
<b><u>Patient variables:</u></b>	<b><u>Patient variables:</u></b>
Gender†	Gender
Birth date*†	Age at resection
SSIN*†	/
Patient Opposition†	/
<b><u>Technical variables:</u></b>	<b><u>Technical variables:</u></b>
Sample ID†	Sample ID
Biopsy number*†	/
Date of prelevation*†	Year of prelevation
Conservation mode†	Conservation mode
Conservation delay†	Conservation delay
Autopsy?	Autopsy?
Available materials†	Available materials
Technical remarks	/

† Mandatory data at registration

\* Identifiable data, not available for researchers

# BVT: Dataset: part 2



Variables in the BVTr (continue)	Variables in the BVTc (continue)
<p><b><u>Oncological variables:</u></b></p> <p>Sample type †</p> <p>Sample localisation†</p> <p>Localisation primary tumour if metastasis</p> <p>Laterality</p> <p>Tumour morphology and behaviour†</p> <p>Differentiation degree</p> <p>pTNM</p> <p>cTNM</p> <p>Oncological remarks</p> <p><b><u>Administrative variables:</u></b></p> <p>Laboratory†</p> <p>Reference ID†</p>	<p><b><u>Oncological variables:</u></b></p> <p>Sample type</p> <p>Sample localisation</p> <p>Localisation primary tumour if metastasis</p> <p>Laterality</p> <p>Tumour morphology and behaviour</p> <p>Differentiation degree</p> <p>pTNM</p> <p>cTNM</p> <p>/</p> <p><b><u>Administrative variables:</u></b></p> <p>Laboratory</p> <p>Reference ID</p>

† Mandatory data at registration

‡ Automatically assigned at registration



*On sample level, not compatible with MIABIS?*



# BVT: Features

- **User-friendly**
- **Web-application**
- Possibility to use the system as a local **registration** system
- Dataset in accordance with information available at the local biobanks
- **Informed consent:** possibility to update the status
- **Quality control**
- Minimal **delay** between input and output

# BVT: BVTr Features



- **INPUT possibilities**
  - Case by case
  - Batch upload
  - (Webservice)
- **Internal validation**
  - Format checks
  - Content checks
  - Cross checks

Oncological characteristics of the sample

Sample type ?

Anatomic localization of the sample ?  until

Behavior ?

Morphology ICD-O ?

Degree of differentiation ?

Pathological TNM ?

Oncological remarks available?

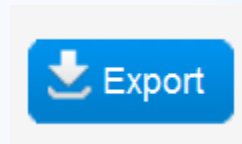
C18.2 - Ascending colon	til
C18.3 - Hepatic flexure of colon	
C18.4 - Transverse colon	til
C18.5 - Splenic flexure of colon	
C18.6 - Descending colon	
C18.7 - Sigmoid colon	
C18.8 - Overlapping lesion of colon	
C18.9 - Colon, NOS	

- **User-friendly**
  - Text-driven search in drop down boxes



# BVT: BVTc Features

- **Updated overview of the content**
  - Pie diagrams
- **Search possibilities**
  - Simple search
  - Advanced search
- **Security limits**
  - Max 2000 results retrieved in one search
- **User-friendly**
  - Text-driven search in drop down boxes
- **Exportable results**



**BELGIAN VIRTUAL TUMOURBANK**  
Catalogue module

SIMPLE SEARCH ADVANCED SEARCH

Metastatic tumours (n=57) Normal tissues  
 ● Non-tumoural lesions

**Histological diagnosis**

adeno

**Results** [Select all](#) Selector

- M8075/3 Squamous cell carcinoma, adenoid
- M8098/3 Adenoid basal carcinoma
- M8140/0 Adenoma, NOS
- M8140/1 Atypical adenoma
- M8140/2 Adenocarcinoma in situ, NOS
- M8140/3 Adenocarcinoma, NOS
- M8141/3 Scirrhous adenocarcinoma
- M8143/3 Superficial spreading adenocarcinoma
- M8144/3 Adenocarcinoma intestinal



Catalogue Home page  
= simple search



SIMPLE SEARCH    ADVANCED SEARCH

[logout](#)

## SIMPLE SEARCH

### Select lesion type

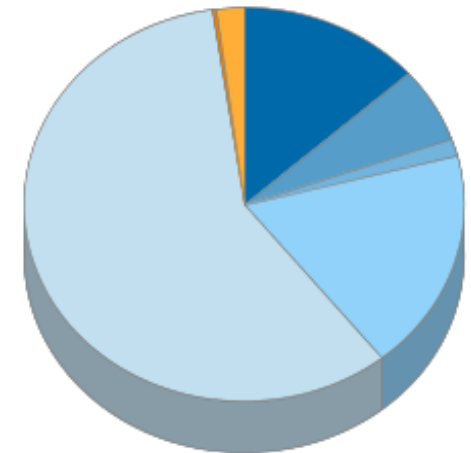
Make your choice here ▼

- Make your choice here
- Benign tumours (/0)
- Uncertain/borderline tumours (/1)
- In situ tumours (/2)
- Primary malignant tumours (/3)**
- Metastatic tumours (/6)
- Normal tissues
- Non-tumoural lesions

Lesion type

### Sample Localisation

- + C00-C14: Lip, oral cavity and pharynx
- + C15-C26: Digestive organs
- + C30-C39: Respiratory system and intrathoracic organs
- + C40-C41: Bones, joints and articular cartilage
- + C42: Hematopoietic and reticuloendothelial systems
- + C44: Skin
- + C47-C49: Connective and soft tissues
- + C50: Breast
- + C51-C58: Female genital organs
- + C60-C63: Male genital organs
- + C64-C68: Urinary tract
- + C69-C72: Central nervous system
- + C73-C75: Endocrine glands
- + C76: Other and ill-defined sites
- + C77: Lymph nodes
- + C80: Unknown primary site



- Benign tumours (/0)
- Uncertain/borderline tumours (/1)
- In situ tumours (/2)
- Primary malignant tumours (/3)
- Metastatic tumours (/6)
- Normal tissues
- Non-tumoural lesions



## SIMPLE SEARCH

### Select lesion type

Primary malignant tumours (/3) ▾

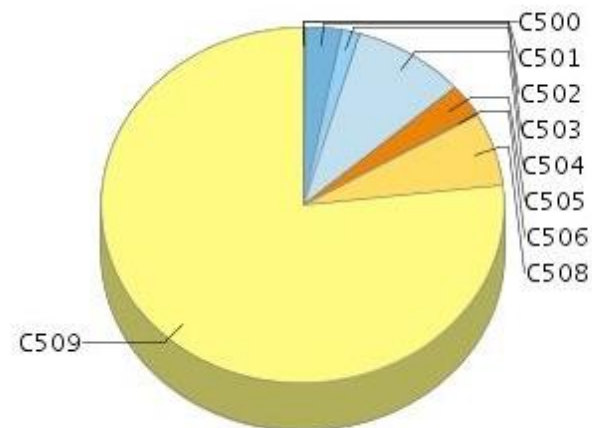
9926 results

Lesion type

### Sample Localisation

- C00-C14: Lip, oral cavity and pharynx (182)
- C15-C26: Digestive organs (1978)
- C30-C39: Respiratory system and intrathoracic organs (1078)
- C40-C41: Bones, joints and articular cartilage (140)
- C42: Hematopoietic and reticuloendothelial systems (53)
- C44: Skin (392)
- C47-C49: Connective and soft tissues (485)
- **C50: Breast (2505)**
  - C500: Nipple (1)
  - C501: Central portion of breast (4)
  - C502: Upper-inner quadrant of breast (74)
  - C503: Lower-inner quadrant of breast (36)
  - C504: Upper-outer quadrant of breast (224)
  - C505: Lower-outer quadrant of breast (74)
  - C506: Axillary tail of breast (2)
  - C508: Overlapping lesion of breast (166)
  - C509: Breast, NOS (1924)
- C51-C58: Female genital organs (320)
- C60-C63: Male genital organs (244)
- C64-C68: Urinary tract (863)
- C69-C72: Central nervous system (546)

Organ (category)



## ADVANCED SEARCH

## Advanced search page



## General Variables


Laboratory   Reference ID  Gender  Male  Female

## Patient criteria

Age

From  to 

## Technical Variables

Sample ID  Sample year  From  to Conservation mode   -20°C  -80°C  -120°C or colder  
 Liquid nitrogen  paraffin (FFPE)  OtherConservation Delay   0 - 30 min  + 30 min  UnknownInclude Autopsy samples  Available materials   Tissue  Cytology  DNA  
 RNA  Proteins  Corresponding normal tissue  
 Serum  Plasma  Whole blood  
 Urine  Other

## Sample criteria

## Oncological Variables

Lesion type   Benign tumours (/0)  Normal tissues  Non-tumoural lesions  
 Uncertain/borderline tumours (/1)  
 In situ tumours (/2)  
 Primary malignant tumours (/3)  
 Metastatic tumours (/4)

Available materials ?

- Tissue
- RNA
- Serum
- Urine

- Cytology
- Proteins
- Plasma
- Other

- DNA
- Corresponding normal tissue
- Whole blood



RIC

### Oncological Variables

**Specify the morphology of the tumour**

Sample localisation ?

Laterality

Histological diagnosis ?

Differentiation grade

Prefix

pT

pN

pM

cT

cN

cM

- 
- 
- 
- 
- 
- [Select](#)
- 
- [Select](#)
- 
- 
- 
- Her
- 
- 
- 

- 0  1  2  3  4 [Select codes](#)
- 0  1  2  3 [Select codes](#)
- 0  1 [Select codes](#)

### Histological diagnosis

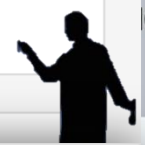
**Results** [Select all](#)

**Selected codes**

Hide duplicates ?

Available materials

- Tissue
- RNA
- Serum
- Urine
- Cytology
- Proteins
- Plasma
- Other
- DNA
- Corresponding normal tissue
- Whole blood



### Oncological Variables

**Specify the morphology of the tumour**

- Sample localisation ?
- Laterality
- Historical diagnosis ?**
- Differentiation grade

- Prefix
- pT
- pN
- pM
- cT
- cN
- cM

### Historical diagnosis

duct carcinoma

Search

Results [Select all](#)

- M8319/3 Collecting duct carcinoma
- M8407/3 Sclerosing sweat duct carcinoma
- M8500/3 Infiltrating duct carcinoma, NOS
- M8541/3 Paget disease and infiltrating duct carcinoma of breast
- M8319/6 Collecting duct carcinoma, metastasis
- M8407/6 Sclerosing sweat duct carcinoma , metastasis

Selected codes

- M8500/3 Infiltrating duct carcinoma, NOS

Clear

Continue with selection

**Include pathological T-staging**

Hide duplicates ?

Search

Clear all





Your search returned 219 registrations, displaying page 1 of 11.

View the results of your search



	Sample Year ▲	Gender	Age	Sample Type	Organ Code	Lesion Code	Conservation Mode	Tissue?	Other Materials?
<a href="#">View</a>	2006	F	58	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2006	F	51	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2006	F	64	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2007	F	48	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	64	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2007	F	65	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2007	F	56	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	49	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	49	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	45	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	62	P	C50.9	M8500/3	-80°C	Y	Y
<a href="#">View</a>	2007	F	53	P	C50.9	M8500/3	-80°C,paraffin (FFPE)	Y	Y
<a href="#">View</a>	2007	F	45	P	C50.9	M8500/3	-80°C	Y	N
<a href="#">View</a>	2007	F	51	P	C50.9	M8500/3	-80°C,paraffin (FFPE)	Y	N

Refine your search

1 2 3 4 ▶ ▶▶

Extend view or export data to **allow localisation**

+ Refine search criteria

🔍 New search

👁 Extended view

📄 Export

# BVT: Achievements and plans

- Achievements:
  - Harmonization of the dataset for registration of the samples
  - Development of the Belgian Virtual Tumourbank registration (BVT<sub>r</sub>) procedure and catalogue (BVT<sub>c</sub>)
  - Link to the clinical database of the Cancer Registry
- Current challenges
  - Integration of hemato-oncology biospecimens
  - Extend the network to the European level (via BBMRI-ERIC)

# 2. BIOTHÈQUE DE LA FÉDÉRATION WALLONIE-BRUXELLES

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**BWB**

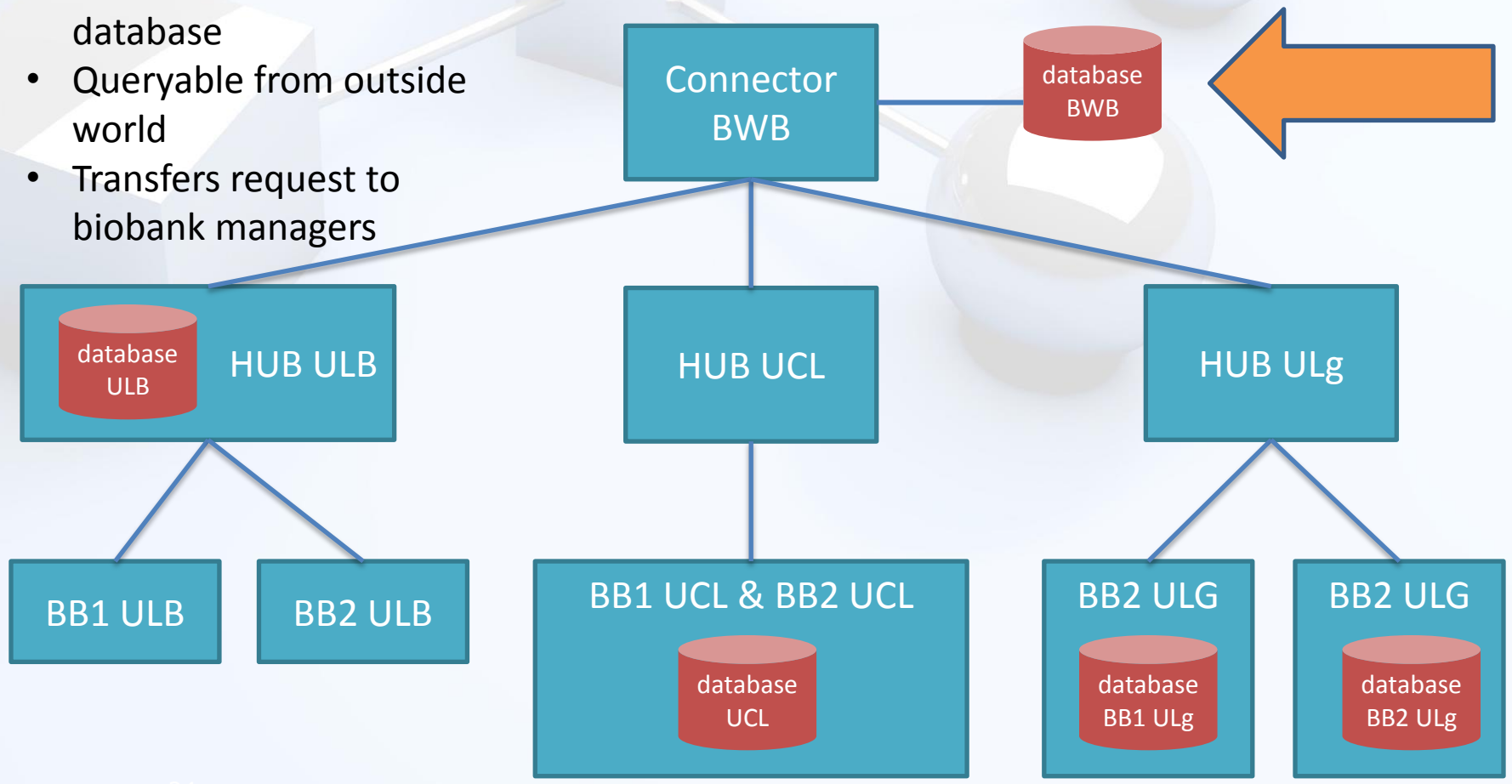
## BWB: Aims & Focus

- To promote bio-medical research in Wallonia and Brussels (FWB-Biowin)
- With a strong emphasis on collaboration with bio-medical industries
- NOT restricted to Oncology
- Financed by DG06 (Walloon region) & Innoviris (Brussels capital region).

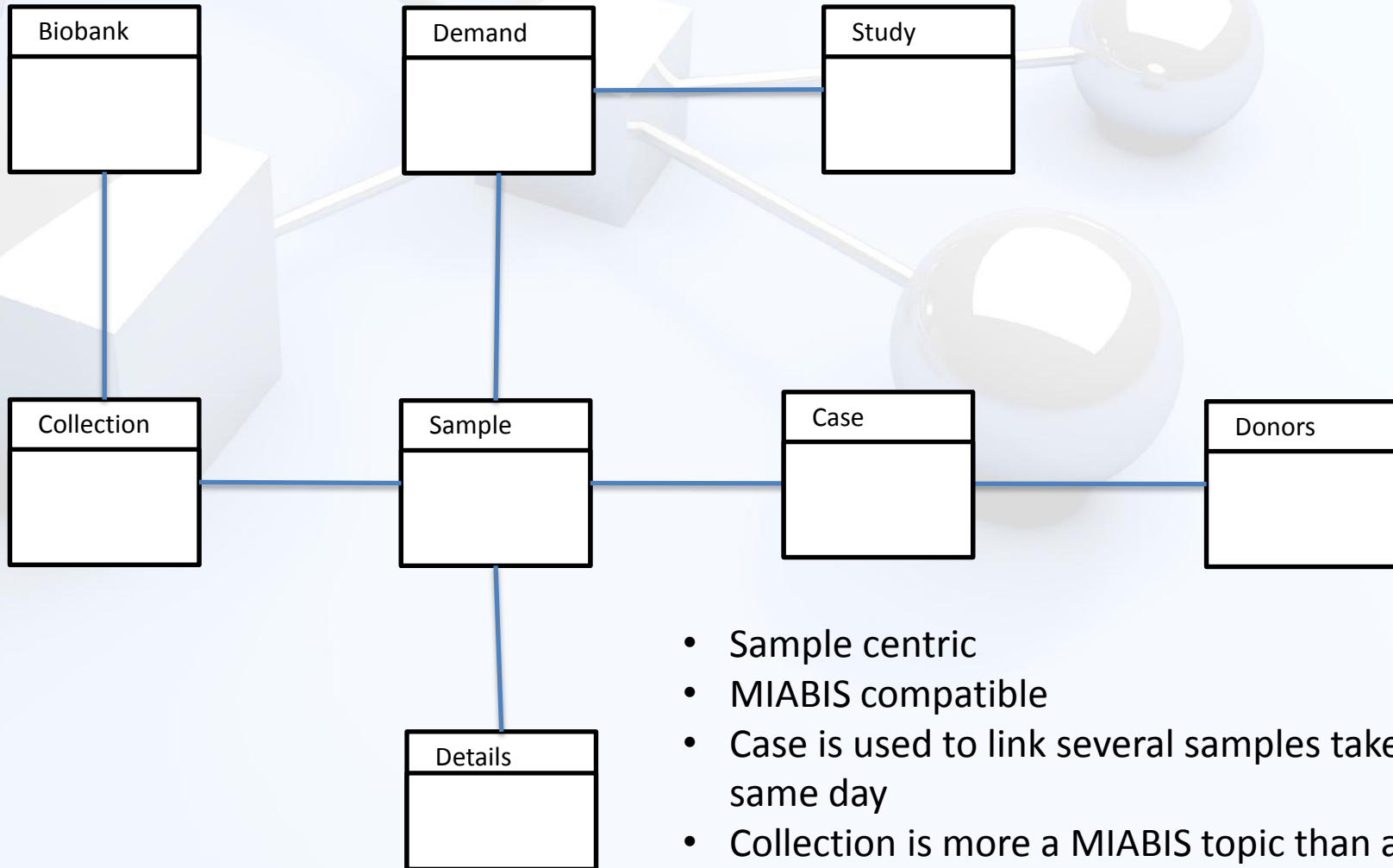
# BWB: Catalog Organisational scheme



- BWB datase = replication of relevant data from local database
- Queryable from outside world
- Transfers request to biobank managers



# BWB: Dataset-structure



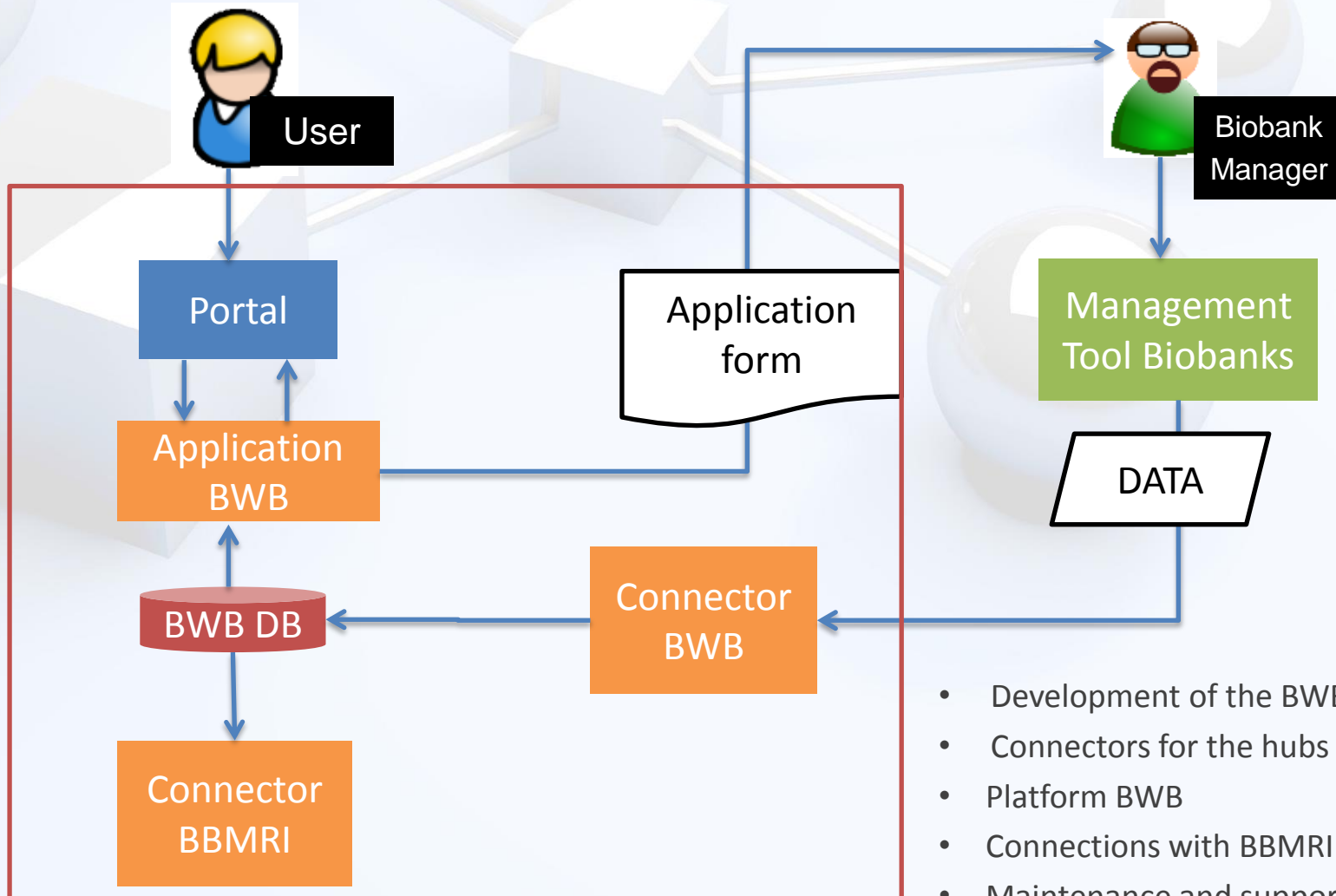
- Sample centric
- MIABIS compatible
- Case is used to link several samples taken on a same day
- Collection is more a MIABIS topic than a local need

# BWB: data structure

Example: sample information stored (extract)

General data	General data	Solid specific	Fluid specific
Sample ID	Other info	SPREC info (solid)	SPREC info (liquid)
Parent Sample ID	Multiple use possible	Origin organ	centrifugation
Material type	Update date	Differentiation	Anti coag type
Take out time	Insert date	Remaining Qty	...
Use conditions	Donor's age	Nbr slices taken	
Sample consent	Data consent	...	
Infection risk	% Invasive		
Case ID	Disease		

# BWB: Central database scope

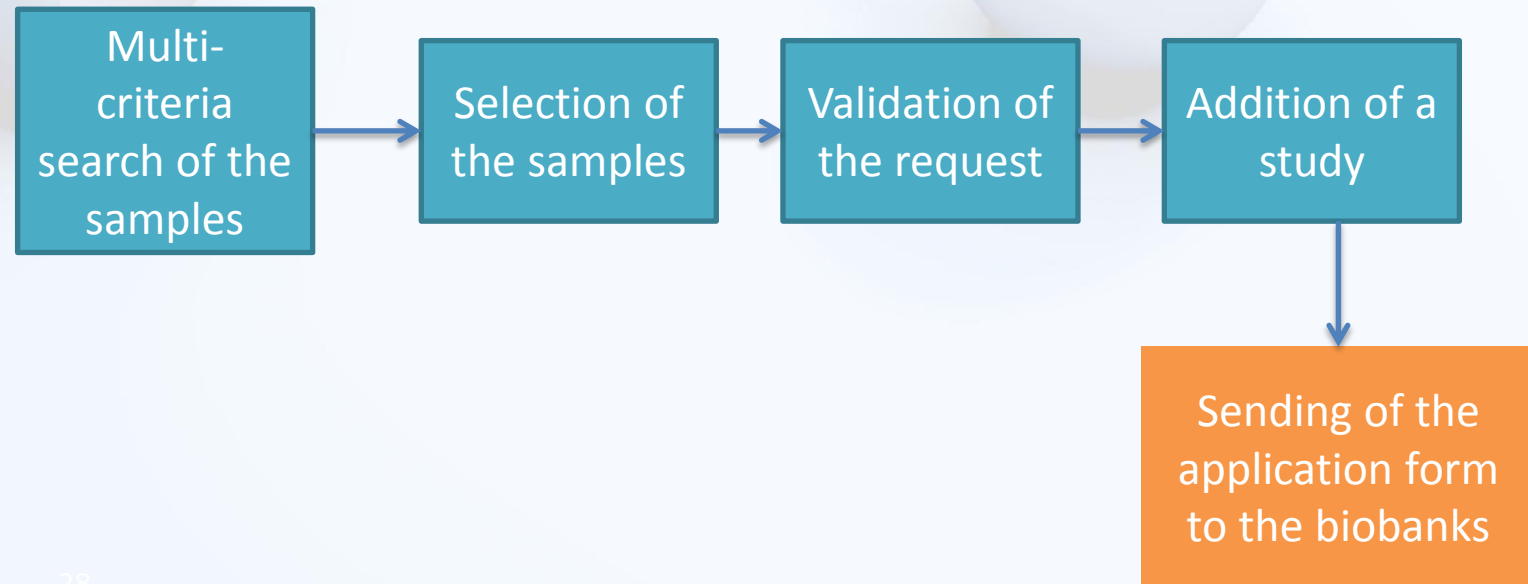


- Development of the BWB Database
- Connectors for the hubs
- Platform BWB
- Connections with BBMRI
- Maintenance and support for 5 years



# BWB: Features

- Sample search
- Sample exchange
- Input of details of study for which researcher requests samples
- Automatically sends the application form to biobanks
- The status of reserved / delivered samples is updated by the biobank management system (Upload / Refresh)



# BWB: specifications

- Biobanks adhere on voluntary terms
- Adherence means:
  - + Acceptance of the Quality Book
  - + Ethics Charter
  - + common documents at disposal (HMTA...)
  - + will to share samples
  - + participation to the virtual catalog
- Will allow simplified search through web portal
- Codes & thesaurii: see MIABIS (SPREC 2)
- Granularity: sample level, but no identifying data
- Data updates: weekly (at least)
- International connections: depending on BBMRI infrastructure
- ELSI issues: conform Belgian legislation

# BWB: Achievements and plans

Approval of the  
specifications

1/15

Tender process

4/15

Development

9/15

Testing &  
Scenario's

1/16

- Delivery of the registry foreseen for 1/1/2016

# 3. CMI: FLEMISH BIOBANKING

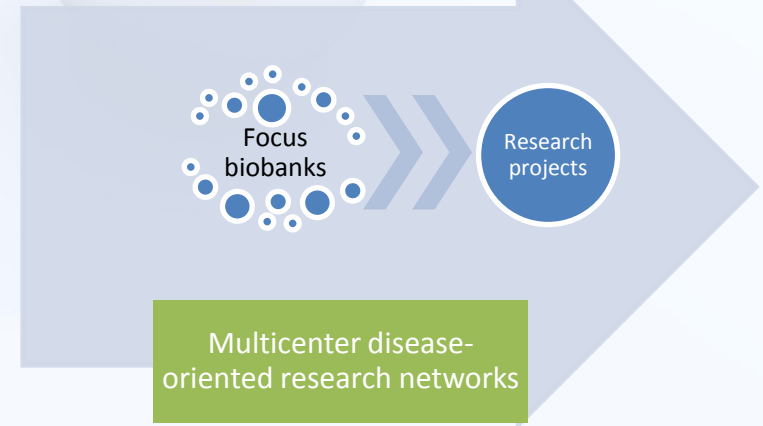
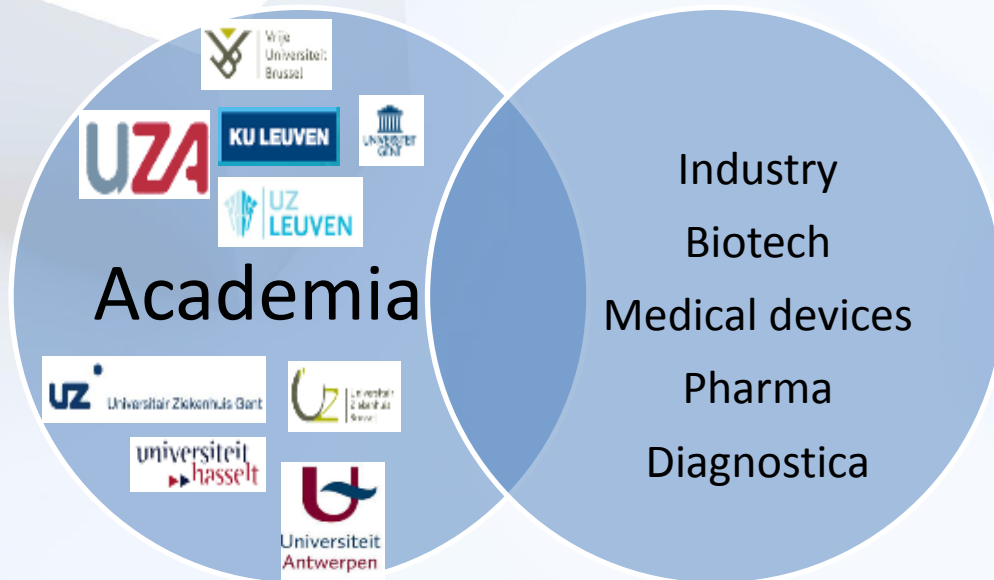
# CMI

Center for Medical Innovation

# CMI: Aims & Focus

**CMI, a multi-partner center for medical innovation**

**Multicenter disease oriented research-networks stimulate Translational Biomedical Research Collaboration in Flanders**



financed by the Flemish Government/EWI/IWT.

# Divers Disease oriented research platforms

Cardiovascular diseases

Metabolic disorders

Viral infectious diseases

Immune mediated  
inflammation

Oncology

Neurodegenerative diseases

COPD/Asthma

Reproductive medicine

Rare diseases

Ageing

Sudden cardiac death

Diabetes

Hepatotrope pathogens

Rheumatic arthritis

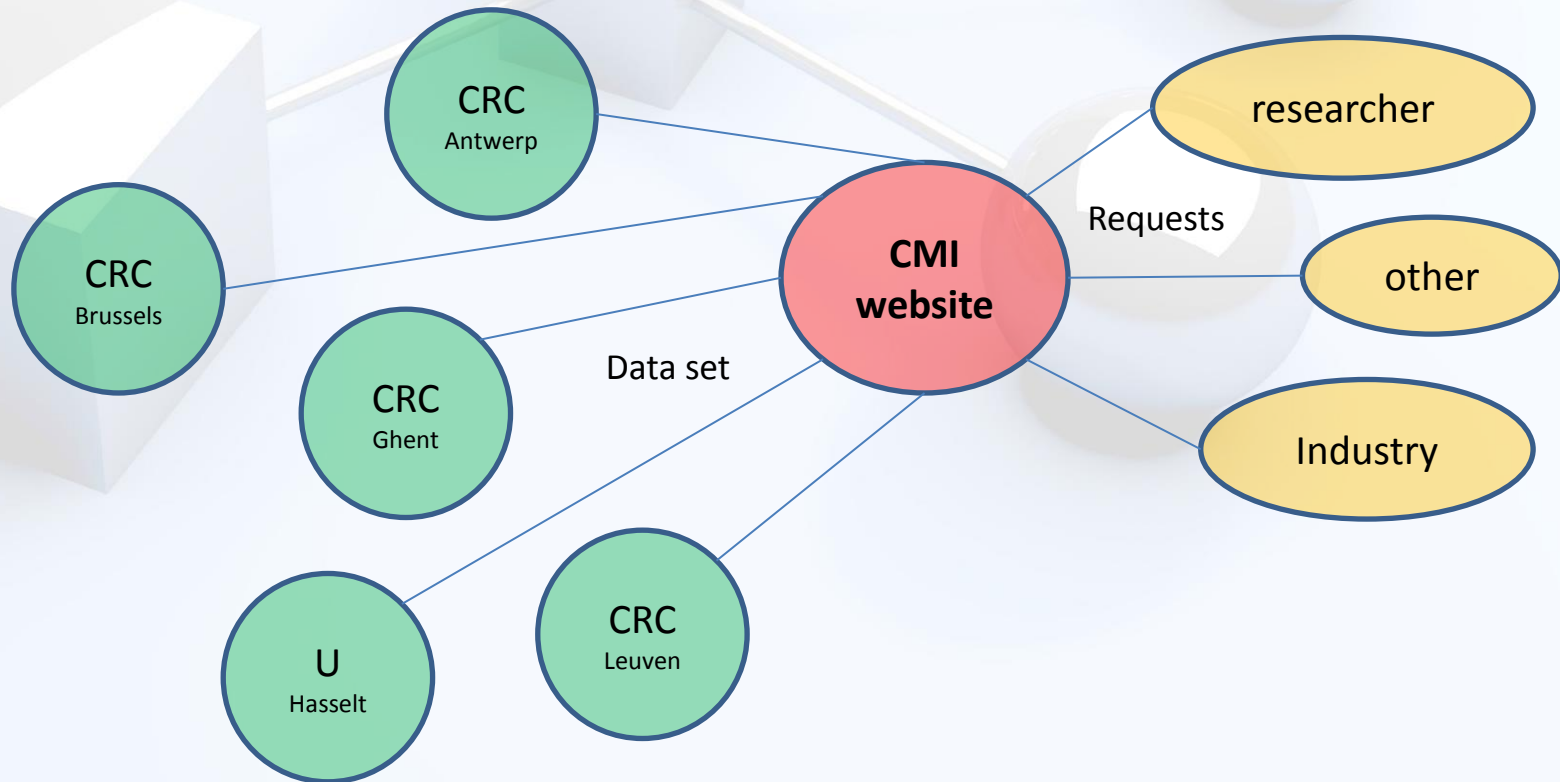
Inflammatory bowel disease

Selection criteria:

- ✓ Demonstrated scientific excellence
- ✓ Industrial interest
- ✓ Valorization potential
- ✓ High quality samples
- ✓ Links with data
- ✓ Available patient populations
- ✓ Research collaboration

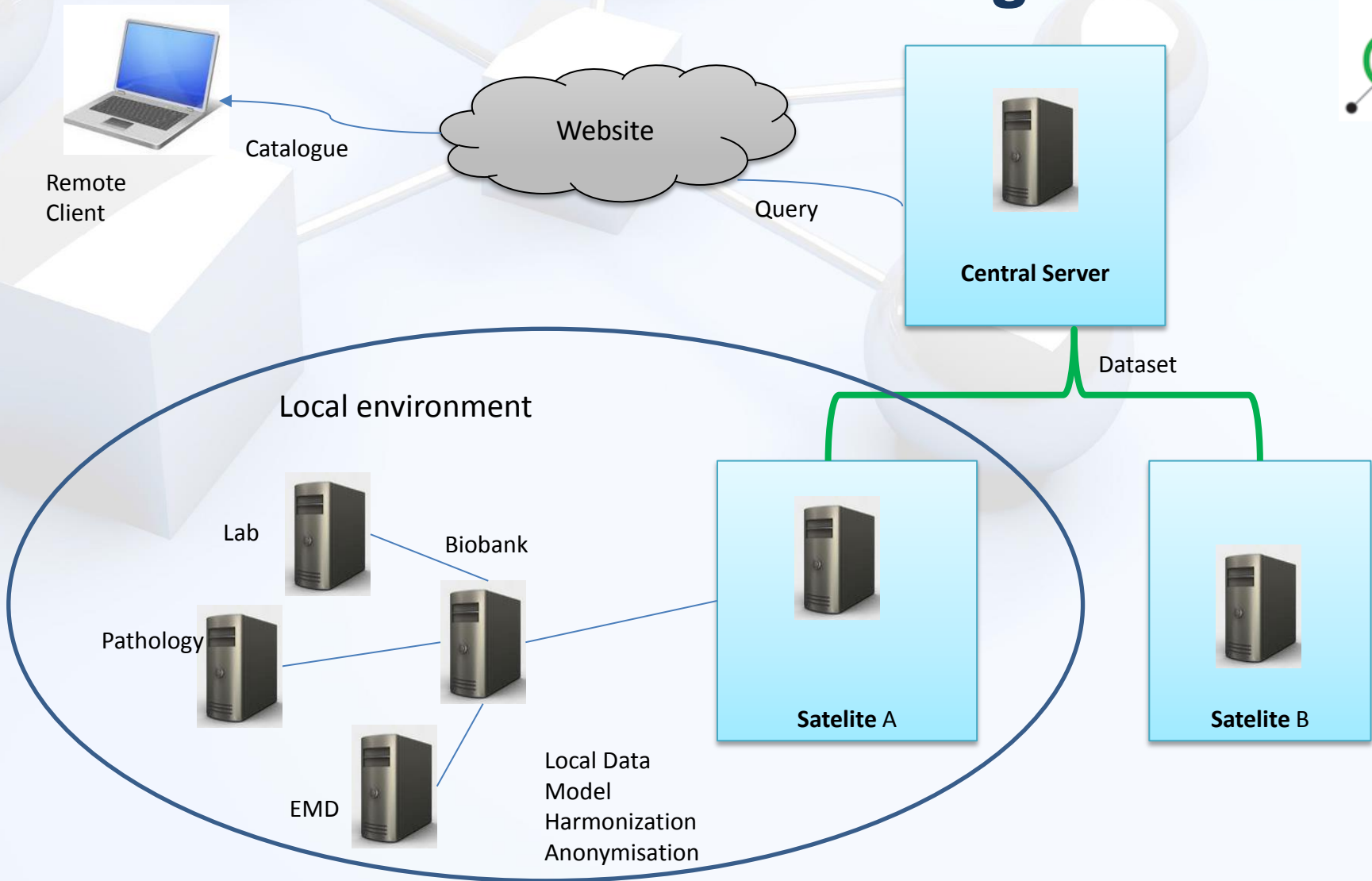
# CMI: Organisational structure

## Regional Hub and Spoke model



# CMI: Organisational structure

## Decentralised data storage





# CMI: Features

- Sample search for research partners
- Sample demand within research project
- Harmonised material transfer agreement
- Extended dataset present in clinical research centre
- The status of reserved / delivered samples is updated by the biobank management system (Upload / Refresh)
- During a translational research project: Project dataset and doc can be shared between centres on a confidential way

# CMI: Minimal DataSet



1	Identity CRC - Biobank
2	Donor ID (coded/anonymized)
3	Sample ID
4	Consent status patient / ethical committee approval
5	Gender
6	Age at sampling
7	Diagnosis patient (ICD-10)
8	Status of material (normal, pathological)
9	Organ / type of tissue
10	Date sampling
11	Known biological or radiological risk
12	SPREC: sampling procedure
13	SPREC: type of sample
14	SPREC: type of pretreatment
15	SPREC: type of storage

# CMI: Achievements and plans

## Achievements:

- \* Infrastructure build up
- \* Interacademic quality handbook and interacademic quality audit
- \* More than 7 % use of biobanksamples in research
- \* Several inter-academic and public private research projects

## Plans:

- \* Workshops:
  - quality assurance
  - translational research projects
  - ethico legal issues
- \* ICT catalogue and datasharing ready mid 2015
- \* Integration of more biobanks planned

# Future prospects

To create and maintain a Belgian Virtual Biobank  
Catalogue in compliance with BBMRI-ERIC guidelines  
by the end of 2015

BBMRI.BE

