

# Deploying the transcriptome for next generation diagnostics and therapeutics

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# Content of this presentation



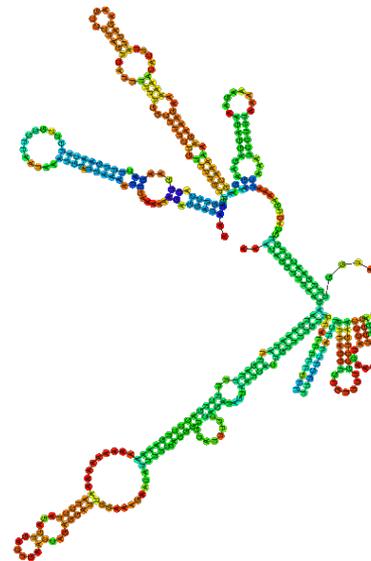
- Biogazelle's vision and mission
- Why RNA
- Why non-coding RNA
- Non-coding RNAs as (companion) diagnostic biomarker
- Non-coding RNAs as therapeutic targets
- Biogazelle's RNA biomarker discovery and validation platforms
- Biomarker discovery and minimal sample input amounts
- Understanding non-coding RNAs
- The road to a qPCR-based CE-IVD test
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# Biogazelle's mission and vision

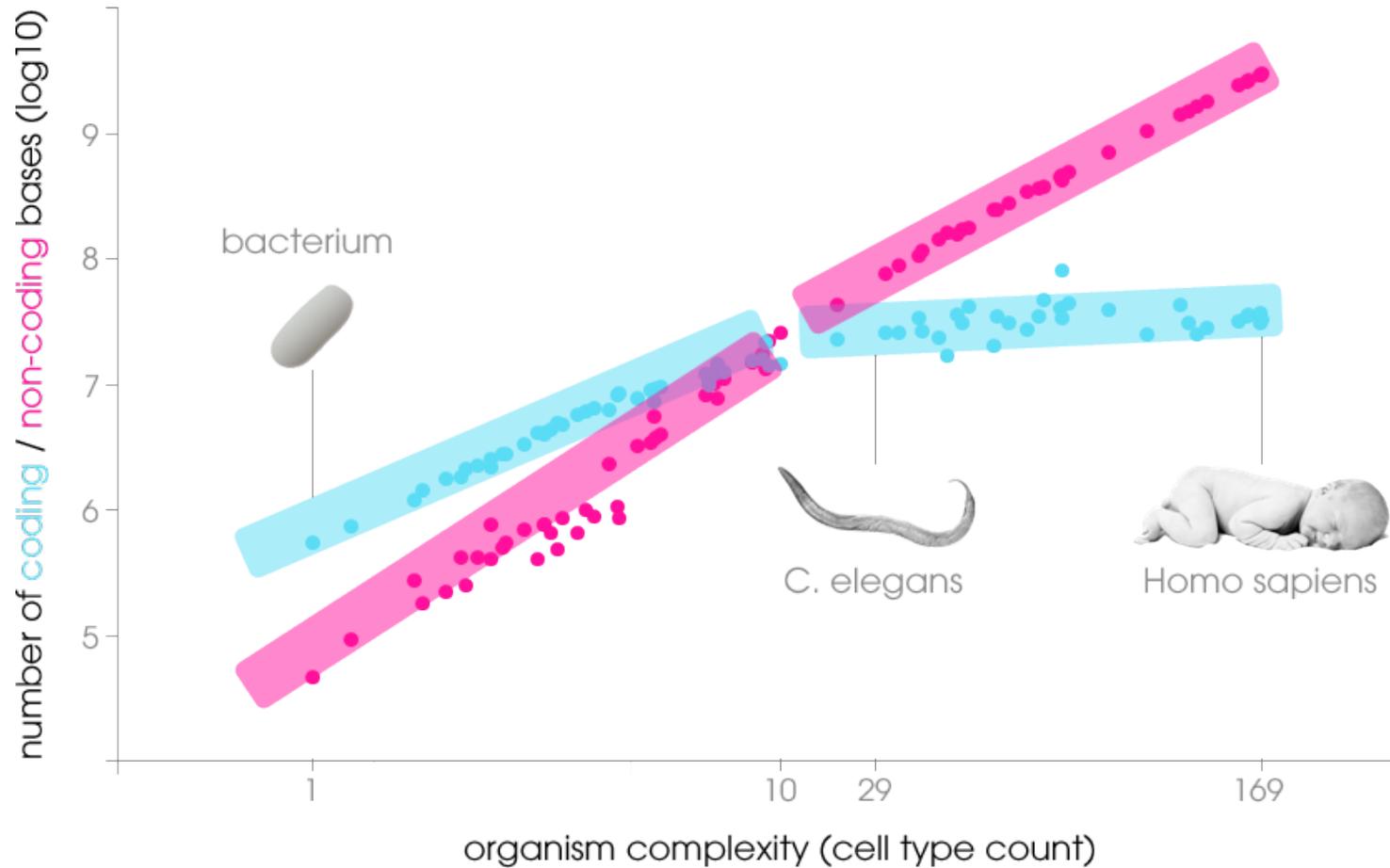
- Founded in 2007 as a Ghent University spin-off by prof. Jo Vandesompele and dr. Jan Hellemans
- **Vision:** Being at the forefront of the genomics revolution, we are convinced that unraveling the **coding** and **non-coding** regions of the genome will lead to RNA targeted biomarkers and treatments for better healthcare
- **Mission:** Deploying the transcriptome for next generation diagnostics and therapeutics through excellence in science and technology
- **Strategy:** Co-development of RNA biomarkers and therapeutics in different therapeutic areas, from discovery to go-to-clinic

# Why study RNA?

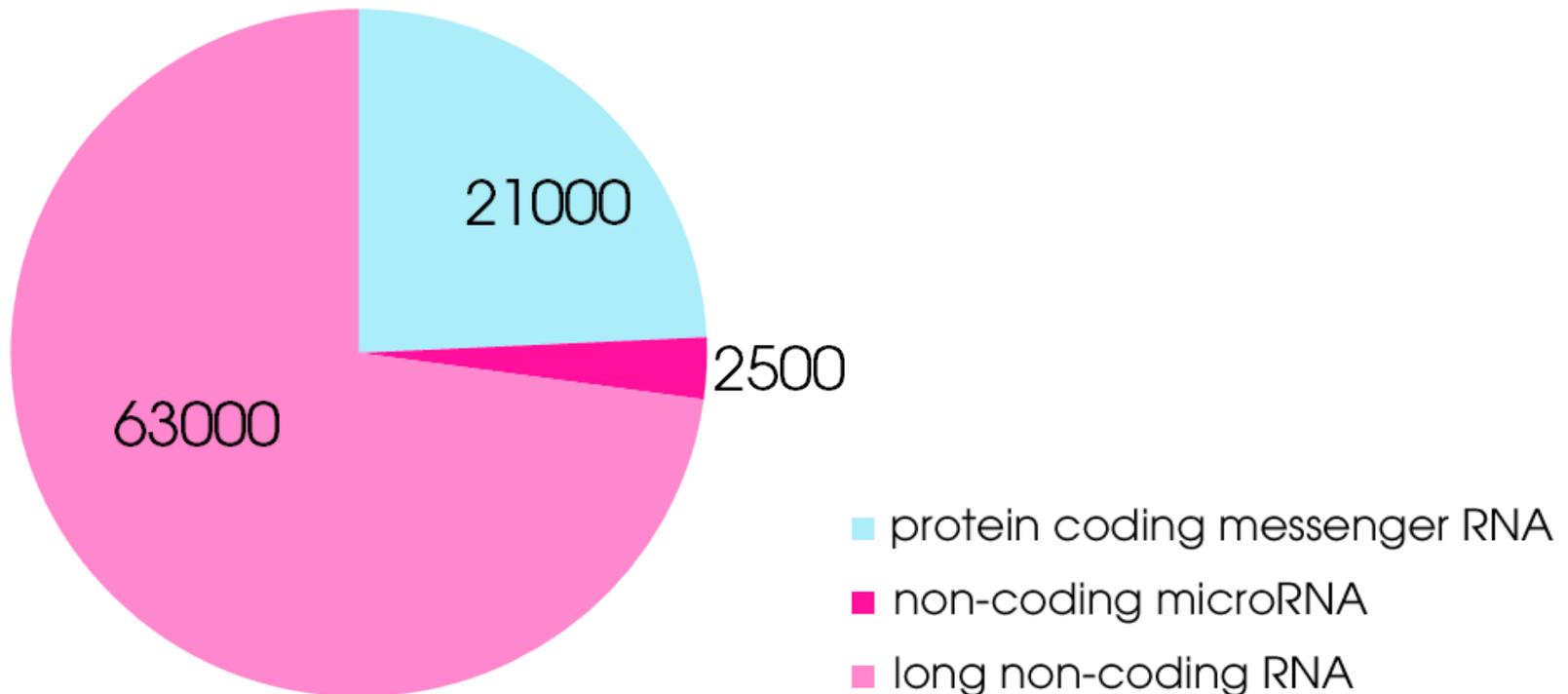
- RNA is a marker for **dynamic changes** in a cell, tissue or organism
- Dedicated RNA measurement **technologies**
  - sensitive
  - large dynamic range (5-15 orders of magnitude)
  - compatible with (ultra) low input amounts
  - high-throughput (# targets, # samples)
- Useful for different **applications**
  - molecular mechanisms of disease
  - mode of action of a compound
  - biomarker for patient diagnosis or stratification
  - therapeutics targets



# Why studying non-coding RNAs?



# Explore more than 80 000 candidate RNA biomarkers



# Non-coding RNAs as interesting biomarkers

- Attractive intellectual property landscape
- Tissue, cell type or disease specific non-coding RNA expression profiles
- Proof-of-concept data for cancer-specific non-coding RNAs that function as lineage survival oncogenes
  - Excellent therapeutic targets
  - Excellent diagnostic/predictive biomarkers (tissue/disease specific)
- Wide variety of RNAs detected in body fluids
  - Minimally-invasive biomarker
  - diagnostic/predictive or response biomarker
- Great potential as companion diagnostic marker

# Growing evidence and development of (nc)RNA biomarkers for diagnostics

## Evaluation of long noncoding RNA MALAT1 as a candidate blood-based biomarker for the diagnosis of non-small cell lung cancer

Daniel Gilbert Weber<sup>1†</sup>, Georg Johnen<sup>1†</sup>, Swaantje Casjens<sup>1</sup>, Oleksandr Bryk<sup>1</sup>, Beate Pesch<sup>1</sup>, Karl-Heinz Jöckel<sup>2</sup>, Jens Kollmeier<sup>3</sup> and Thomas Brüning<sup>1</sup>

*Review*

## Detection of miRNA as Non-Invasive Biomarkers of Colorectal Cancer

Albert Ren<sup>1,2</sup>, Yujuan Dong<sup>1,3</sup>, Ho Tsoi<sup>1</sup> and Jun Yu<sup>1,\*</sup>

## Appraisal of diagnostic ability of UCA1 as a biomarker of carcinoma of the urinary bladder

A. K. Srivastava · P. K. Singh · S. K. Rath · D. Dalela ·  
M. M. Goel · M. L. B. Bhatt

## Plasma long noncoding RNA protected by exosomes as a potential stable biomarker for gastric cancer

Qier Li · Yongfu Shao · Xinjun Zhang · Tuo Zheng ·  
Min Miao · Lijun Qin · Bojun Wang · Guoliang Ye ·  
Bingxiu Xiao · Junming Guo



### Oncotype DX<sup>®</sup> Breast Cancer Assay

The Oncotype DX<sup>®</sup> Breast Cancer Assay can help physicians and patients decide on the best course of treatment. For invasive breast cancer, the Oncotype DX Breast Cancer Assay predicts chemotherapy benefit and the likelihood of distant breast cancer recurrence. The Oncotype DX Breast Cancer Assay for DCIS patients predicts the risk of local recurrence. Even when traditional measures seem conclusive, Oncotype DX Recurrence Score can lead to a different approach.

[Learn More](#)



# Rheumakit

## MDxHealth.

### SelectMDx for Prostate Cancer



# Non-coding RNAs as therapeutic targets

RXi Pharmaceuticals Announces Remarkable and Positive Results with its Novel Self-Delivering RNAi Platform: Potent Reduction of Long Non-coding RNAs Demonstrated in Collaboration with Biogazelle

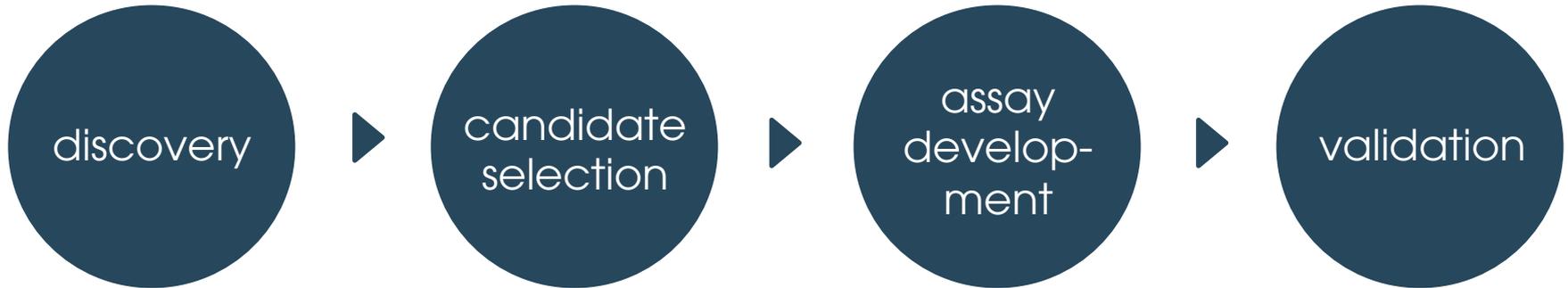


**RXi Pharmaceuticals**  
Next Generation in RNAi®

Biogazelle and Isis evaluate long non-coding RNAs to identify and validate novel targets for anti-cancer drugs



# Biogazelle's RNA biomarker discovery and validation platforms



## Technology

- RNA seq
- body Fluids
- FFPE
- low input
- non-coding RNA

## Applications

- biomarker discovery
- therapeutic targets
- on- and off-target / MOA
- disease mechanism

## Bio-IT

- diff gene expression
- ariant analysis
- vltalternative splicing
- prediction of functions
- LNCarta
- biomarker signature

## RNA-based Dx

- PCR assay design
- assay validation and documentation for CE IVD test development

## Clinical trial studies

**ISO 17025**  
ACCREDITED LABORATORY

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Discovery platform

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Validation platform

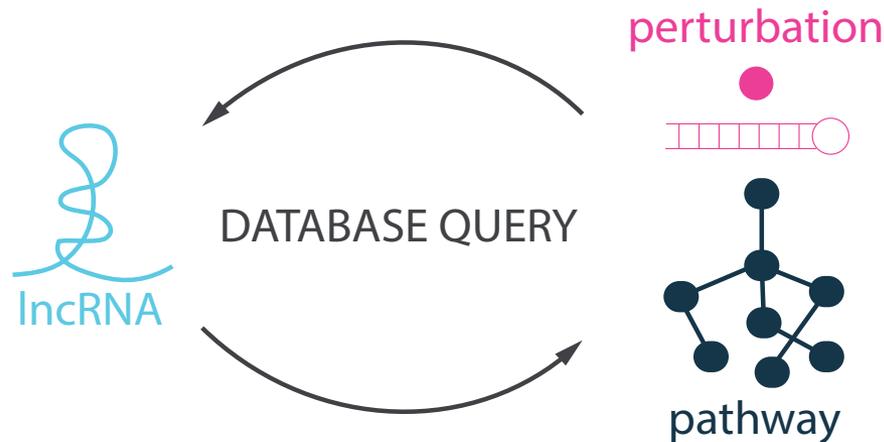
# RNA biomarker discovery and minimal sample input amounts

Minimum input amounts (100 ng of total RNA)

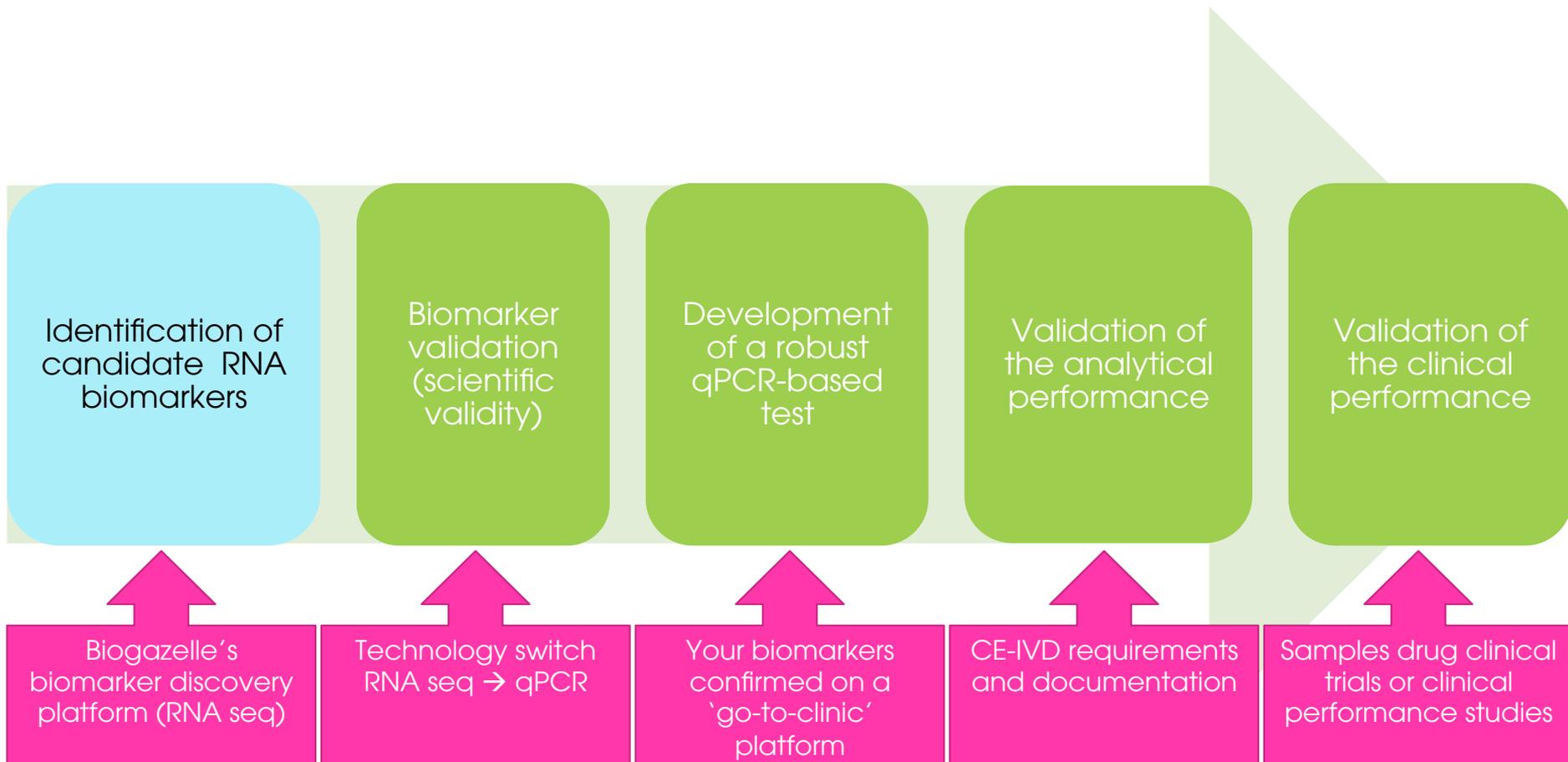
- Fresh frozen tissue (max 50 mg)
- Cultured cells
- Whole blood (PAXGene tubes)
- Serum, plasma and body fluids (200  $\mu$ l)
- FFPE (4 sections, 10  $\mu$ m thick and < 250 mm<sup>2</sup> surface)

# Understanding ncRNAs through LNCarta

- > 60 000 lncRNA genes annotated, yet < 300 functionally characterized lncRNAs
- LNCarta: database of lncRNA functions through high-throughput perturbation by
  - chemical compounds
  - silencing of TFs through siRNA



# Biomarker validation & the road to a qPCR-based CE-IVD test



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# biogazelle

deploying the transcriptome

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