

Introducing the Netherlands X-omics Initiative



1. General Information

Title: Netherlands X-omics Initiative

Main applicant: Prof. dr. Alain van Gool (Radboudumc)

Scientific summary: Globally renowned Dutch leaders in the field of genomics, proteomics, metabolomics and data integration & analysis join forces to realize the Netherlands X-omics Initiative. Together, they will further expand the strong Dutch 'omics' technology footprint with innovations that 1. push the boundaries of the individual omics

Alain van Gool

The Netherlands X-omics Initiative

Facilities in NWO X-omics cluster on the current landscape:

DNA sequencing and analysis

Radboudumc Genomics Technology Center

Proteins@Work

Metabolomics Facility Leiden

Biomarker Development Center

Radboudumc Technology Centers

Edwin Cuppen

Marcel Nelen

Albert Heck

Thomas Hankemeier

Rainer Bischoff

Alain van Gool

Utrecht

Nijmegen

Utrecht

Leiden

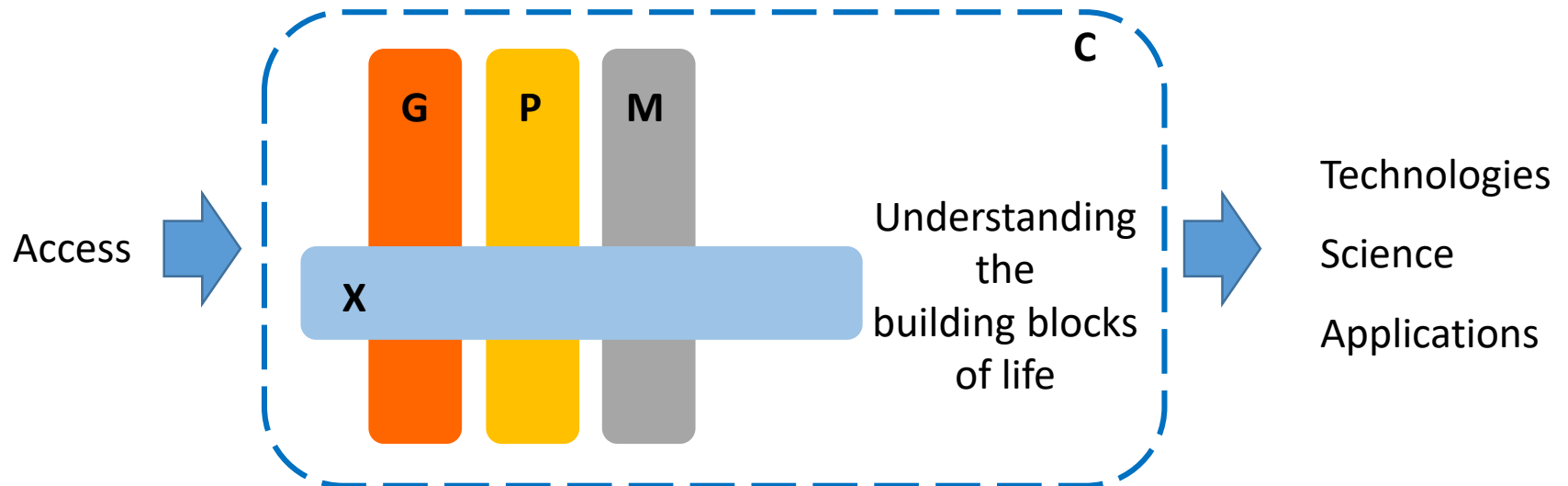
Groningen

Nijmegen



Positioning of the Netherlands X-omics Initiative

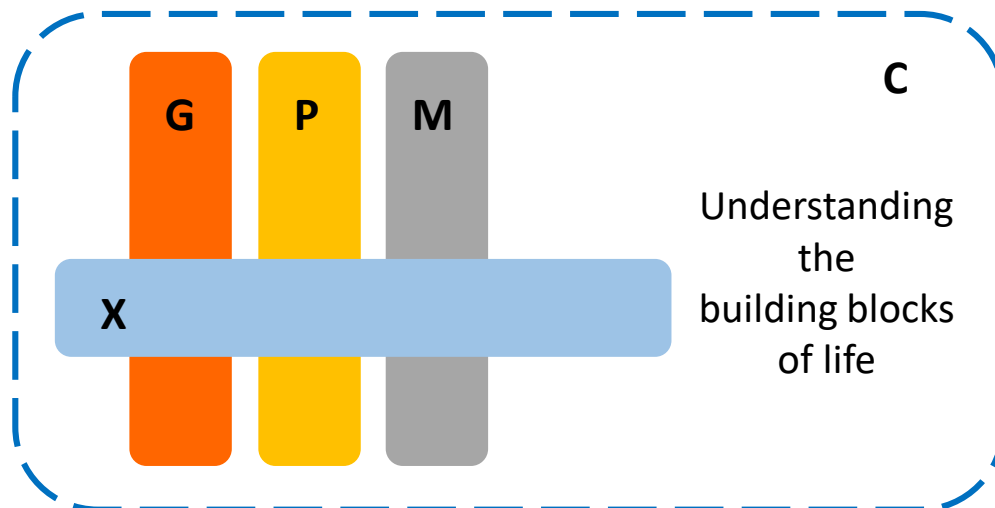
- Brings together Netherlands-based **world experts in genomics, proteomics, metabolomics** and their applications (**biomarkers**) in 1 cluster
- Builds on a **very strong basis of earlier omics investments** in infrastructure
- **Strategic technological development** within cluster of the next generation omics to **understand building blocks of life** and **enable personalized medicine and health research**
- Build **one accessible portal** for the best Omics expertise in the world



The Netherlands X-omics Initiative

Choices:

- Focus on pushing **technological** boundaries in each Omics domain
 - Minuturalisation (less amount of sample)
 - Scaling up (higher number of samples)
- Focus on **integration** of x-omics data to enable system biology
 - Generate data FAIR-at-the-source
 - Develop methods to combine x-omics data + other data
- Develop the x-omics infrastructure, **no research projects**
- **Prepare for scaling up** to society



The X-omics analysis pipeline

Step 0: x-omics public portal

- Definition of research question
- Experimental design & planning



Step 1: pre-analytical support

- Sampling
- Pre-analytical processing



Step 2: sample analysis

- Analysis in one or more of the innovation cores

innovation cores



Step 3: data analytics and interpretation

- Bioinformatics & systems biology (incl. modelling)
- Data visualisation
- Planning of follow-up experiments



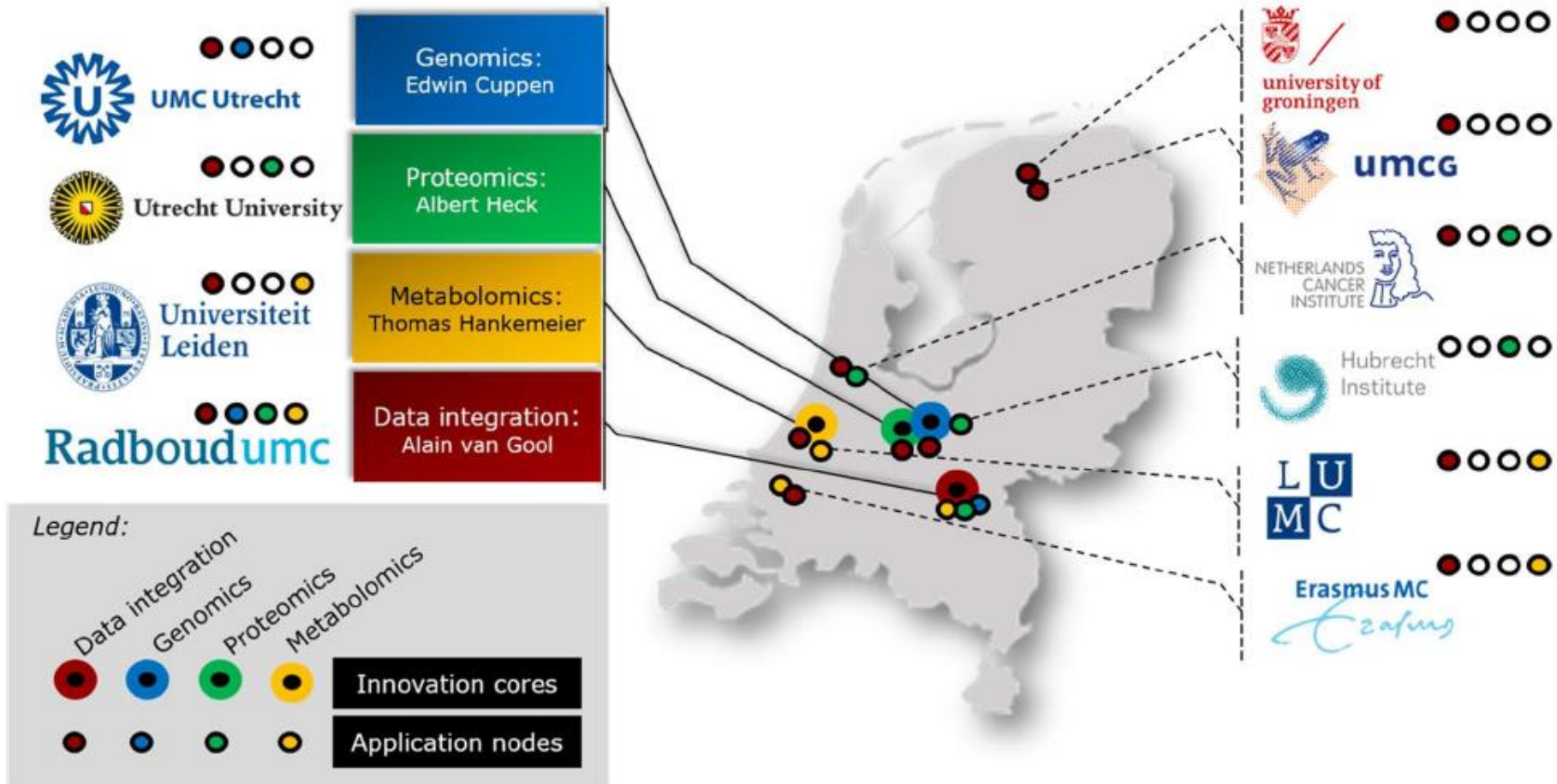
X-omics analysis pipeline

Population research demonstrator

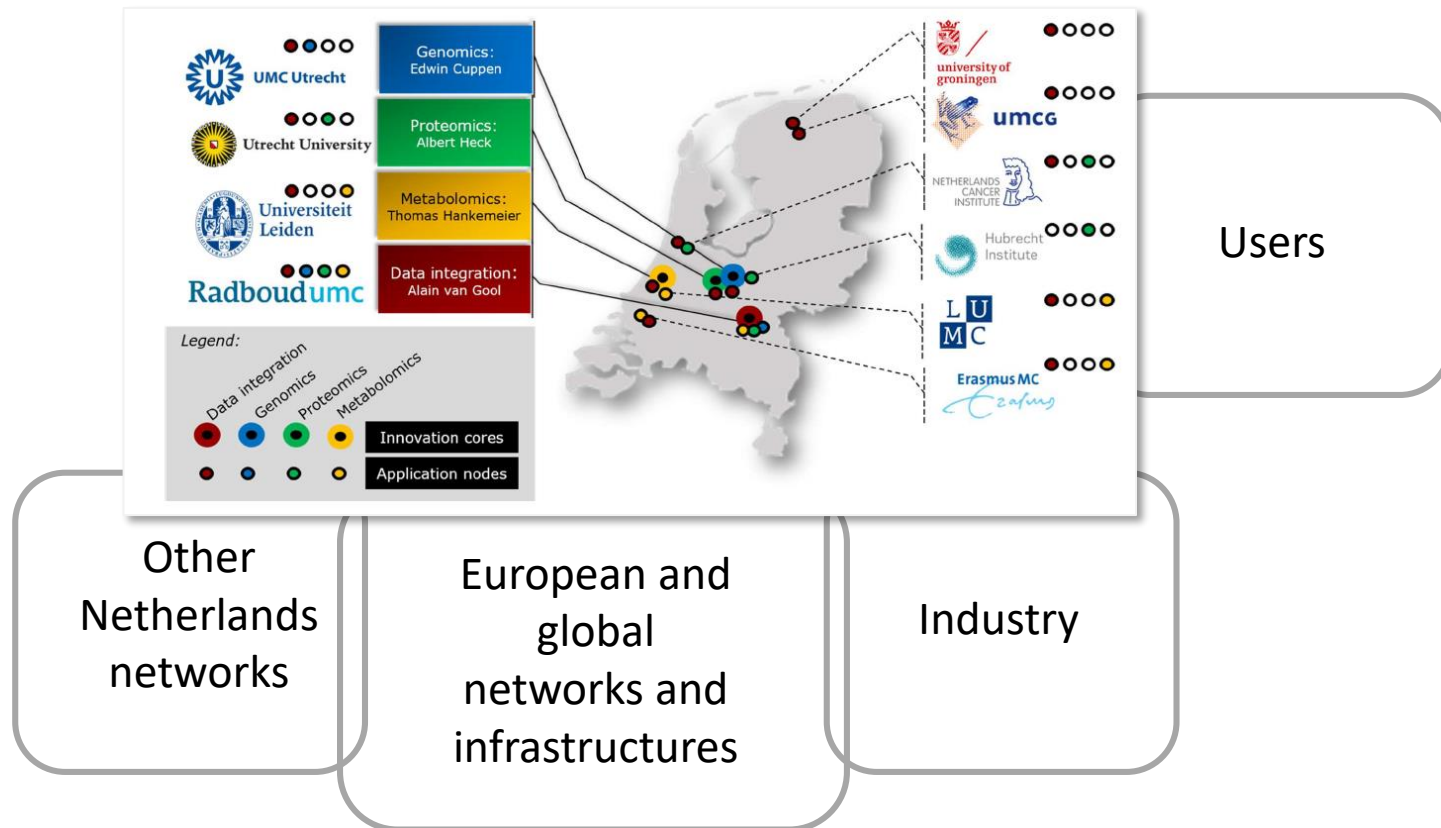
Clinical research demonstrator

Cellular biology research demonstrator

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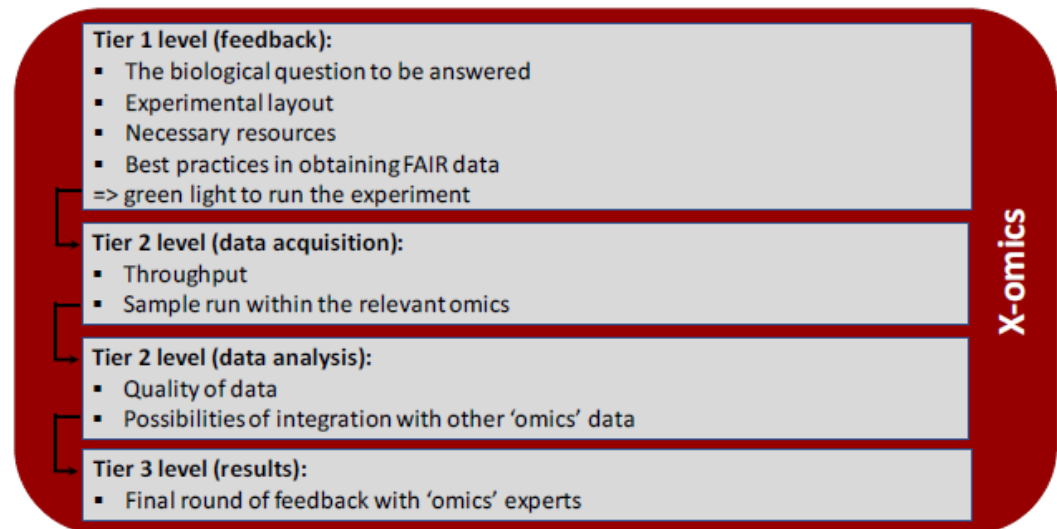
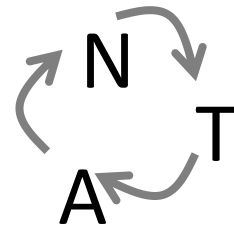
Organisation



- National network with 1 point for coordination, access, exploitation (**C**)
- Per omics (**G, P, M, X**) 1 core group and several NL nodes with distinct roles
- Connection to NL, EU and global networks, and to industry

Access to the Netherlands X-omics Initiative

- **Helpdesk** for advice and best practice (X-omics, BBMRI, ELIXIR)
- **3 criteria** to improve infrastructure (access board):
 - 1. Scientific merit, 2. technical feasibility, 3. expected impact
- **Access management** using ARIA system (INSTRUCT)
 - Full proposal submission and administration system
- Once operational, division operational time:
 - 20% development
 - 30% demonstrators
 - 30% researchers
 - 20% industry
- Sustainability



www.x-omics.nl

Figure 7b. Overview of the access procedure once a project is positively evaluated.