# RESEARCH SUPPORT IN THE NETHERLANDS

## CURRENT SITUATION AT VUmc

**SURF**

Many institutions are involved in research support: they want to support their researchers in their access to high-quality ICT infrastructure in order to process, analyse, visualise, manage and store research data. Each institution does this in its own way. SURF presents a series on how institutions organise their research support and their agenda for the future. This series is based on SURF's Support4research innovation project. This project aims to ensure that the services provided by SURF to researchers better meet the needs of the institutions and researchers. This episode focuses on VU University Medical Center Amsterdam (VUmc). **If you want to share your approach to research support, please let us know by sending an email to support4research@surf.nl.**

# SUPPORT FOR RESEARCH AT VUMC

## VUmc
**(2015 figures)**

**Scientific staff**
1,079

**Number of academic staff**
155

**Number of PhD students**
900 (640 employed
as PhD student,
260 otherwise)

**Number of students**
1,271 (bachelor)
1,436 (master)

**Number of auxiliary staff**
Within VUmc, supporting
functions for care and
research overlap too
much to be shown as a
separate figure here

**Scientific publications
per year**
A total of 2,953 scientific
journal articles and 429
specialist publications,
reports, books and book
chapters

**Areas of activity**
The core tasks consist of
patient care, education
and research. Research
is conducted by a
network comprising the
eight multidisciplinary
research institutions listed
in the table on the right

## Introduction

Patient-based research is one of the core strengths of the Vrije Universiteit Medical Centre (VUmc). Our primary focus is translational research, which addresses how scientific developments can be of benefit to patient care.

Research at VUmc is conducted by a number of multidisciplinary research institutions. Within these institutions, VUmc has, recently collaborated primarily with Vrije Universiteit Amsterdam (VU). The number of research institutions has expanded from five to eight as the result of the proposed alliance with the Academic Medical Center (AMC). Within these eight research institutions, the VUmc, AMC, VU and University of Amsterdam (UvA) – potentially also a number of other research institutions – will work together in Amsterdam.

Research at VUmc focuses primary on cancer, the immune system, the brain and nervous system, the heart and circulation, reproduction and development, nutrition and metabolism, extramural and transmural care, and human movement. Each research institution has its own primary focus.

## Vision for research support

VUmc wishes to provide researchers with support spanning all areas of the data lifecycle, including applying for grants and commercialising research. Various points of contact are available to researchers within VUmc. Researchers can turn to the data management department, the Clinical Research Bureau (CRB), the grants desk, a privacy officer for research, statistical support and the Medical Research Ethics Committee (METc). In addition, the ICT department has a special (delivery) team for research, education and innovation that concentrates on applications used by researchers. This delivery team also provides access to the VUmc Research Cloud. This is a VMware-based environment where researchers can create and run virtual machines.

VUmc is working to consolidate all of these points of contact into a single virtual help desk under the name "Support4research". Support4research organises meetings for researchers, sets up a website for research, answers questions, and refers researchers to the right support groups. VUmc wants to provide researchers with as much support as possible by means of standard procedures and services without these limiting researchers' freedom.

| RESEARCH INSTITUTION | PRIMARY FOCUS |
| --- | --- |
| Amsterdam Neuroscience | Brain |
| Amsterdam Gastroenterology & Metabolism | Nutrition and metabolism |
| Cancer Center Amsterdam | Cancer |
| Amsterdam Reproduction & Development | Reproduction and development |
| Amsterdam Infection & Immunity | Immune system |
| Amsterdam Public Health | Extramural and transmural care |
| Amsterdam Cardiovascular Sciences | Heart and blood vessels |
| Amsterdam Movement Sciences | Movement |

See also www.amsterdamresearch.org

VUmc is working to establish an alliance with the AMC. Researchers from VUmc, AMC, VU and UvA will work together on projects within these research institutions. This is why we are seeking to jointly organise at least part of the research support. In anticipation of the alliance, VUmc and AMC have opted to make use of a joint Electronic Patient Dossier (EPD), which enables researchers to access data about each others' patients, if authorised to do so. AMC and VUmc are also working together in the fields of data disclosure, data management and valorisation. In addition, AMC and VUmc are collaborating on the development of a joint research infrastructure. Furthermore, we are aligning the research information plans for AMC and VUmc, and are working on drawing up a joint research information plan for 2018.

At national level, we are collaborating as part of the Netherlands Federation of University Medical Centres (NFU) Data4lifesciences, the Committee of UMC IT Directors (AcZie), the Platform of IT managers (TacZie), SIG Prima (special interest group for reference architecture) and Translational Research IT (TraIT). Moreover, the business intelligence departments of the various UMCs are working together to use each others' knowledge and experience as much as possible.

At international level, it is important to jointly influence European privacy guidelines to ensure that policymakers take full account of the privacy aspects of scientific research in the life sciences. International cooperation is also important when putting together cohort studies focusing on rare diseases. This is why a point of contact (the grants desk) has been set up which is up to date on the directives for European collaboration and the prerequisites for awarding grants.

## Organisational guarantees

For the provision of care, VUmc is subdivided into six divisions. Each division is home to a number of medical departments. Different departments from various divisions work together within the research institutions. Research support is primarily covered by Division VI. This division consists of the Clinical Research Bureau (CRB), the grants desk, the data management department, the information manager for research, and part of the statistical support.

In addition to placing research support within Division VI, the ICT department is home to a delivery team tasked with research, education and innovation. In 2015, this delivery team organised a Support4research day together with SURF, TraIT and the information manager for research. The aim of this day was to present a use case to provide researchers with an insight into the services provided by SURF, TraIT and ICT for research.

For the protection of privacy and information security, a privacy officer dedicated for research has been appointed. VUmc uses the library facilities provided by the VU.

The data management help desk assists researchers with obtaining research data. If a researcher only requires data from the EPD for research purposes, the EPD service centre supplies the data. VUmc uses the Research Data Platform (RDP) for the provision of data from multiple sources. This RDP is an extension for research on the data warehouse of business intelligence (BI). The data warehouse contains information from a range of data sources for the purpose of company support (days hospitalisation, diagnosis/treatment packages (DBC), etc.). For research purposes, the data warehouse has been expanded to include sources such as EPD data, lab results, pathology reports and more. The RDP is able to combine data from various sources and provide a pseudonym.

## Support scenario

A researcher has an idea. The grants desk helps the researcher find out what grant options are available to them. In parallel to this, the researcher draws up a data management plan for their research, and talks to the research privacy officer in order to find out how to safeguard the privacy of the patients involved. METc is informed of the study, and the study is recorded in the EPD after approval is granted. This allows the researcher to request transactions from the EPD for the study. They also receive support from the data management department. They receive information stored in the EPD combined with the pathology reports from the research data warehouse. This data is delivered under a pseudonym. Researchers can process and analyse the data using virtual machines in the VUmc Research Cloud. Based on the data, they can then publish their conclusions in one or more publications. The information is subsequently provided with metadata and archived for re-use. The virtual machines are also archived so that they may also potentially be re-used.

## Current and future e-infrastructure and support situation

In the VUmc Research Cloud, researchers can use virtual machines that they manage themselves. After an intake procedure by the ICT delivery team for research, education and innovation, the researcher is granted access to the Research Cloud. In the Cloud, the researcher can create, amend, delete and archive virtual machines. The researcher can create these virtual machines within a virtual organisation (VO) and keep them logically separate from other machines. The virtual machines can be connected to the Internet if desired.

The researcher can use the Store4Ever storage facility to store their data. This storage is relatively cost-effective and easily scalable. Users are charged an annual fee based on their use of the service. In addition to virtual machines, VUmc has a computer cluster with 512 cores available in multiples of 64 cores. A researcher can use the VUmc Research Cloud to connect and use the computing capacity of SURFsara by providing SURFsara with access to the data in the VO via a lightpath (multi-service port connection). This enables the computing capacity to be scaled up if there is not sufficient capacity within VUmc.

In the VUmc Research Cloud, researchers can create virtual Windows and Linux machines themselves. They can also collaborate with third parties. If they do so, the researcher needs to take care of the user management on the virtual machines. In the future, VUmc is aiming to utilise SURFconext for user management. The Research Cloud portal can already be accessed via SURFconext, but user management within the virtual machine is not yet available. Using SURFconext, it is easy to invite parties outside VUmc to use the Research Cloud. Local accounts can be linked to the employer's account. SURF is working on a solution to enable user management within a virtual machine. At present, SURFconext is only suitable for the authentication of web-based applications.

E-infrastructure

| COMPUTING SERVICES | |
| --- | --- |
| **Number of clusters within the institution** | 1 general computer cluster + 1 for medical genetics |
| **Total scope of computing power** | 128 cores, 1 TB memory (VUmc Research Cloud) + 512 cores in the computer cluster |
| **Third-party clusters within the institution** | None; breakout to SURFsara |
| **Acquisition of computing services** | None |
| STORAGE | |
| **Capacity of centrally provided bulk storage** | 1300 TB (1,3 PB) netto, out-of-the-box extendable to 12 PB. Parallel file system scalable up to $2^{64}$ (9 quintillion) files and $2^{99}$ bytes |
| **Capacity of centrally provided archives** | Tiered storage (tier 0 t/m 2) with active archiving (always online) of FLASH/SSD, SAS/SATA to redundante LTO6 tape robots offering intergrated lifecycle management and recall |
| **Externally purchased storage services** | Vancis in case of contract research |
| NETWORK | |
| **Routed capacity (external)** | 1 Gb/sec, scalable to 2x10 Gb/sec |
| **MSP capacity** | 1 Gb/sec, underlying network infrastructure multiple 10 Gb/sec |
| AUTHENTICATION & AUTHORISATION INFRASTRUCTURE | |
| **Connected to SURFconext Federation** | Yes |
| **Other AAI suppliers** | None |

## Agenda for research support

In 2015, VUmc organised a major seminar called "Support4research" jointly with SURF and TraIT. The evaluation of this seminar indicated that researchers would prefer to focus in more depth on a single topic. This is why in 2017, VUmc initiated a new round of Support4research meetings. These meetings take place every eight weeks. Each meeting has a specific topic and lasts approximately one hour. During each meeting, two researchers explain how they made use of a particular service, what went well and where there is room for improvement. A supporting service then explains what it can offer researchers. The meeting concludes with a discussion about the subject.

In addition to the Support4research meetings, VUmc wants to publish the Support4research "brand" in the form of a website and newsletter. The intention is to form an overarching committee in which to discuss research questions. We want this to cover the following activities and elements: protection of privacy and information security, the Clinical Research Bureau (CRB), data management, the grants desk, METc, statistical support, information management and ICT. Our aim is to create a joint information portal for research which is based on the data lifecycle.

## References

2015 Annual Report

# COLOPHON

**More information**

**SURF**
Moreelsepark 48
3511 EP Utrecht
The Netherlands

Postbus 19035
3501 DA Utrecht
The Netherlands

+31 20 88 787 30 00
info@surf.nl
support4research@surf.nl
www.surf.nl/s4r

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education and research. SURF offers students,
lecturers and scientists in the Netherlands access
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