



The following pages contain a series of screenshots taken from menoci instances used to support data management for the [Collaborative Research Centre 1002](#).

Information visible in some pictures may have been altered or blurred because it has not been cleared for publication by the original owners or creators.

The use case depicted is designed to roughly illustrate how menoci supports data management in an advanced light microscopy setting, i.e. how antibodies used for microscopy staining can be documented and referred to in the system. Finally, result data from the experiment is uploaded and the relation to a published scientific article is documented.

## 1. Overview of menoci instance start page

The start page of the CRC1002 menoci instance allows access to four menoci modules for non-authorized users: Published Data Registry, Antibody Catalogue, Lab Notebook Registry and Cell Model Catalogue. Following successful login, more modules are available. The startpage further contains a project description as well as contact information for the project speaker, participating institutions and funding agency.

Research Data Platform

Published Data Registry

Antibody Catalogue

Lab Notebook Registry

Cell Model Catalogue

User login

Username \*

Password \*

Request new password

Log in

Welcome to CRC 1002 Research Data Platform

**Scientific Profile**

Therapeutic options for patients suffering from heart failure are poor. It is the goal of the CRC 1002 to identify new specific treatment targets and develop new therapeutic strategies to treat heart failure. Identification of therapy targets is pursued by evaluation of the spatial organization of signal transduction in nano- and micro-domains. Our strategy is based on the assumption that key regulatory processes are compartmentalized. The specific localized therapy targets are defined as "modulatory units". During the first funding period we focus on target identification, but in subsequent funding periods, development of therapeutic strategies into clinical phases I and II is foreseen. We define the following project areas:

A. **Functional microdomains** such as 1) cAMP- and cGMP-microdomains as local intracellular key mechanisms of pathophysiological signal transduction or 2) calcium release units consistent of L-type calcium channels and ryanodin receptors. Project area A investigates localized intracellular processes.

B. **Sensor complexes** such as 1) the titin molecule as a potential sensor of myocyte stretch (preload) and the subsequent transformation of hemodynamic load into cellular signal transduction or 2) the complex consisting of hypoxia inducible factor and prolyl-4-hydroxylase(PHD)-domain-enzymes (HIF-1 $\alpha$ /PHD) as oxygen and hypoxia sensors. Project area B defines molecular mechanisms as sensing events of the functional status of the myocyte, which will be transferred into cellular processes.

C. **Cell-cell-interaction** via extracellular signaling compartments in the communication between myocytes, endothelial cells, fibroblasts and immune cells. Project area C evaluates poorly understood cross-talk mechanisms of the stromal compartment of the multicellular organ.

Project areas are deeply interconnected.

CRC 1002 PIs agreed on a common data policy which is available [here](#).

Participating Institutions:

MAX-PLANCK-INSTITUT FÜR BIOPHYSIKALISCHE CHEMIE  
MAX-PLANCK-INSTITUT FÜR DYNAMIK UND SELBSTORGANISATION  
GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN  
UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

Contact us

Technical Support: [sfb1002-support@gwdg.de](mailto:sfb1002-support@gwdg.de)  
Department of Medical Informatics  
University Medical Center Göttingen

Links

[SFB 1002 - Project description](#)  
[Department of Medical Informatics Göttingen](#)

Speaker

Prof. Dr. Gerd Hasenfuß  
The speaker of Collaborative Research Center  
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0551 / 39-20400

Funded by Deutsche Forschungsgemeinschaft

## 2. Documentation of antibodies

When accessing the Antibody Catalogue module (here as an already logged in user), antibodies registered with the system are displayed split into categories of primary and secondary antibodies. A searchbar allows for quick access to specific information. All data available for the current user based on access privileges may be exported in spreadsheet format. If authorized accordingly, new antibody information may be registered by the user.

The screenshot displays the 'Antibody Catalogue' interface. At the top, there is a navigation bar with the 'Research Data Platform' logo and several icons representing different data management functions. Below the navigation bar, the title 'Antibody Catalogue' is prominently displayed. A message indicates that the catalogue currently contains 1005 antibodies (918 primary, 87 secondary). A search bar is provided with the placeholder text 'Antigen Symbol, Name, Alternative name, Antigen'. To the right of the search bar are 'Import' and 'Export' buttons. The main content is divided into two sections: 'New primary antibodies' and 'New secondary antibodies'. Each section contains a table with columns for 'AG', 'PID', 'Antigen Symbol', 'Antibody Registry', 'Name', 'Clonality', 'Antigen', 'Quality', 'Company', and 'Catalog no.'. Below each table are two buttons: 'See all [primary/secondary] antibodies' and 'Register new [primary/secondary] antibody'.

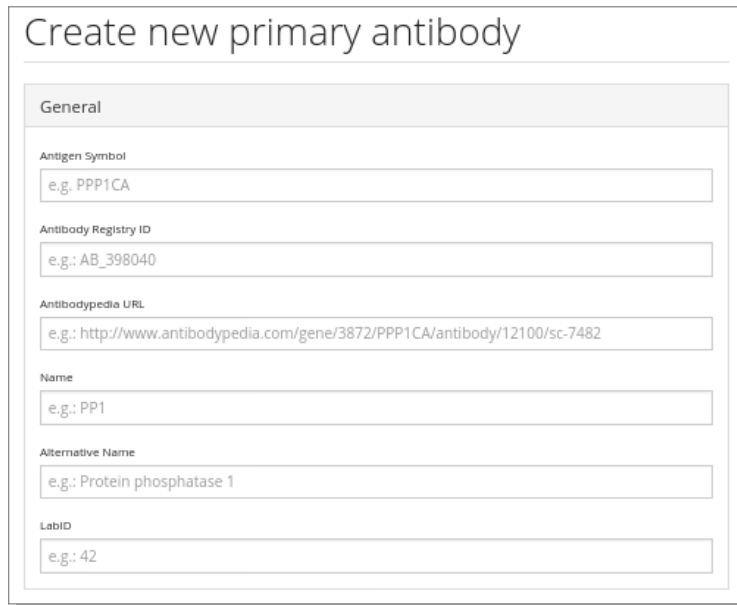
| AG | PID                               | Antigen Symbol              | Antibody Registry | Name                                      | Clonality  | Antigen  | Quality | Company | Catalog no. |
|----|-----------------------------------|-----------------------------|-------------------|---|------------|--|---------|---------|-------------|
| SL | umg-sfb1002-antibody-primary-1154 | V5 tag                      |                   | Anti-V5 tag antibody                      | polyclonal | GKPIPNPLLGLDST (V5 epitope) conjugated with KLH.   | -       | Abcam   | ab9116      |
| SL | umg-sfb1002-antibody-primary-1153 | alpha Tubulin               |                   | Anti-alpha Tubulin antibody               | polyclonal | Synthetic peptide conjugated to KLH derived from within residues 400 to the C-terminus of Human alpha Tubulin. | -       | Abcam   | ab18251     |
| SL | umg-sfb1002-antibody-primary-1152 | Y-Tubulin                   |                   | Anti-Y-Tubulin                            | polyclonal |  | -       | Sigma   | T3320       |
| SL | umg-sfb1002-antibody-primary-1151 | alpha Tubulin detyrosinated |                   | Anti-Detyrosinated alpha Tubulin antibody | polyclonal | A 10 residue synthetic peptide of the C terminal domain of human alpha Tubulin.                                | -       | Abcam   | ab48389     |
| SL | umg-sfb1002-antibody-primary-1150 | Troponin T                  |                   | Anti-Cardiac Troponin T antibody          | monoclonal | Other Immunogen Type corresponding to Human Cardiac Troponin T aa 171-190.                                     | -       | Abcam   | ab8295      |

| AG | PID                                 | Antibody Registry | Name   | Excitation | Quality | Company                  | Catalog no.  |
|----|-------------------------------------|-------------------|--|------------|---------|--------------------------|--------------|
| SL | umg-sfb1002-antibody-secondary-1158 | AB_91300          | Goat Anti-Rat IgG Antibody, HRP conjugate                        |            | -       | Millipore                | AP130P       |
| SL | umg-sfb1002-antibody-secondary-1157 | AB_631736         | goat anti-mouse IgG-HRP  |            | -       | Santa Cruz Biotechnology | sc-2005      |
| SL | umg-sfb1002-antibody-secondary-1156 | AB_631736         | goat anti-mouse IgG-HRP  |            | -       | Santa Cruz Biotechnology | sc-2005      |
| SL | umg-sfb1002-antibody-secondary-1155 | AB_10015300       | Rabbit Anti-Rat IgG Antibody, mouse adsorbed (H+L), Biotinylated |            | -       | Vector Laboratories      | BA-4001      |
| SL | umg-sfb1002-antibody-secondary-1104 | AB_2810981        | Goat anti-rabbit IgG, STAR580 antibody                           |            | -       | Abberior                 | 2-0012-005-8 |

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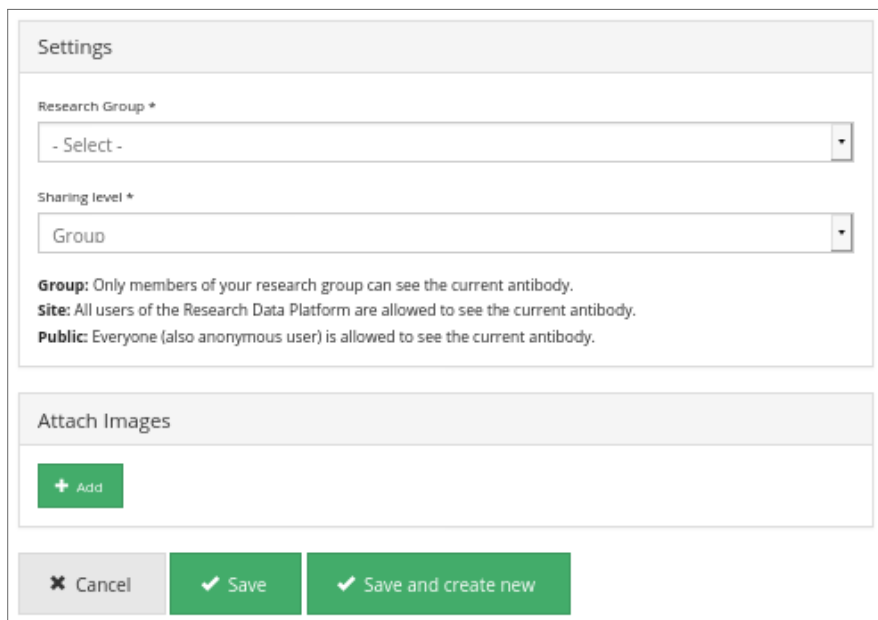
When inserting new antibody data, multiple descriptive metadata are collected from the user, including manufacturer, catalogue nr., Lot number, and on-site storage information.



The screenshot shows a web form titled "Create new primary antibody". It contains several input fields with example values:

- Antigen Symbol:** e.g. PPP1CA
- Antibody Registry ID:** e.g.: AB\_398040
- Antibodypedia URL:** e.g.: <http://www.antibodypedia.com/gene/3872/PPP1CA/antibody/12100/sc-7482>
- Name:** e.g.: PP1
- Alternative Name:** e.g.: Protein phosphatase 1
- LabID:** e.g.: 42

Finally, the user is asked to specify which of the project's research groups is in possession of the described antibody and which „Sharing level“ shall be assigned. Four different „Sharing levels“ allow distinction between publically visible data, project-wide, research group-internal, or private data. These same levels provide users of the menoci system with a simple recurring classification of data visibility.



The screenshot shows a "Settings" form with two dropdown menus and explanatory text:

- Research Group \***: A dropdown menu with the option "- Select -".
- Sharing level \***: A dropdown menu with the option "Group".
- Group:** Only members of your research group can see the current antibody.
- Site:** All users of the Research Data Platform are allowed to see the current antibody.
- Public:** Everyone (also anonymous user) is allowed to see the current antibody.

Below the settings is an "Attach Images" section with a green "+ Add" button. At the bottom are three buttons: "Cancel", "Save", and "Save and create new".

Images may be uploaded and annotated with comments, for example when further detailing antibody performance in Western Blot.

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A newly created antibody item will be assigned an internal identifier. When cooperating with a Handle.net compatible Persistent Identifier (PID) provider (i.e. the EPIC consortium), internal IDs may be registered permanently and used for public reference. The PID is display at the top of antibody item display page.

The inserted information may be retrieved as a JSON or PDF document.

### Basic data

|                       |   |
|-----------------------|---|
| <b>PID</b>            | umg-sfb1002-antibody-secondary-1156   |
| <b>EPIC PID</b>       | <a href="https://hdl.handle.net/11022/umg-sfb1002-antibody-secondary-1156">https://hdl.handle.net/11022/umg-sfb1002-antibody-secondary-1156</a> |
| <b>Research group</b> | AG Voigt  |
| <b>Quality (mean)</b> | no score (0.00)   |
| <b>Sharing level</b>  | Public  |

Once an antibody has been registered and used in multiple experiments, users have the possibility of adding performance quality rankings. A simple 0-5 star ranking system allows other users to quickly assess how well a certain antibody has performed in their colleagues' experiments.

Furthermore, publications registered with the menoci instance that refer to the selected antibody are displayed on the right.

## View secondary antibody

### Basic data

|                       |   |
|-----------------------|---|
| <b>PID</b>            | umg-sfb1002-antibody-secondary-649  |
| <b>EPIC PID</b>       | <a href="https://hdl.handle.net/11022/umg-sfb1002-antibody-secondary-649">https://hdl.handle.net/11022/umg-sfb1002-antibody-secondary-649</a> |
| <b>Research group</b> | AG Lehnart  |
| <b>Quality (mean)</b> | ★★★★★ (5.00)  |
| <b>Sharing level</b>  | Public  |

### Applications

Immunofluorescence (IF) ★★★★★ (5.00)

| AG  | Dilution | Concentration | Quality | Comments   |
|-----|----------|---------------|---------|--|
| SLP | 1:1000   |               | ★★★★★   | applicable for confocal and STED microscopy <span style="float: right;">✎</span> |

Add new application comment

### Antibody data

|                                |                                   |
|--------------------------------|-----------------------------------|
| <b>Antibody Registry ID(s)</b> |                                   |
| <b>Name</b>                    | Abberior STAR 580 goat anti-mouse |
| <b>Alternative name</b>        |                                   |
| <b>Lab ID</b>                  |                                   |
| <b>Tag / Fluorophore</b>       | Abberior STAR 580                 |
| <b>Raised in</b>               | Goat                              |
| <b>Clone</b>                   |                                   |
| <b>Isotype</b>                 | IgG                               |
| <b>Clonality</b>               |                                   |
| <b>Antigen</b>                 | mouse antibodies                  |
| <b>Excitation Max.</b>         | 587 nm                            |
| <b>Emission Max.</b>           | 607 nm                            |

### Linked publications

[Glyoxal as an alternative fixative to formaldehyde in immunostaining and super-resolution microscopy.](#)  
 Richter KN, Revelo NH, Seitz KJ, Helm MS, Sarkar D, Saleeb RS, D'Este E, Eberle J, Wagner E, Vogl C, Lazaro DF, Richter F, Coy-Vergara J, Coceano G, Boyden ES, Duncan RR, Hell SW, Lauterbach MA, Lehnart SE, Moser T, Outeiro T, Rehling P, Schwappach B, Testa I, Zapiec B, Rizzoli SO  
 EMBO J 2017 : [10.15252/emj.201695709](https://doi.org/10.15252/emj.201695709)

[Junctophilin-2 expression rescues atrial dysfunction through polyadic junctional membrane complex biogenesis](#)  
 Brandenburg S, Pawlowitz J, Eikenbusch B, Peper J, Kohl T, Mitronova GY, Sossalla S, Hasenfuß G, Wehrens XHT, Kohl P, Rog-Zielinska EA, Lehnart SE  
 JCI Insight 2019 : [10.1172/jci.insight.127116](https://doi.org/10.1172/jci.insight.127116)

### 3. Documentation of microscopy experiment

The CRC1002 instance of menoci contains the „Advanced Light Microscopy and Nanoscopy“ (ALMN) module that provides workflow support for the local imaging service unit.

Documentation of microscopy experiments is structured accordingly into „requests“ by users, „consultation“ documentation by service unit personnel, and data upload functionality for the user.

Create new ALM request

Advanced Light Microscopy > Requests > Create new ALM request

**User Profile**

**User name**  
suhr2

**Name**  
Suhr, Markus

**Position**  
PI/Postdoc/PhD student: [refresh icon]  
The Position in your Group

**Institute**  
Department of Medical Informatics

**Research Group**  
AG Nußbeck

**Project**  
Please select your project  
Your Project

**Sample Information**

**Sample Type(s)**  
cultured cells (HEK, HeLa) / primary cells (cardiomyocytes, fibroblasts) / tissue (heart)/EHM

**Target Structure(s)**  
protein of interest / calcium / membranes

**Conditions**  
live cells / fixed cells / fixed tissue slices / live whole heart


**Staining Method**  
immunostain / live membrane stain / calcium indicator

**Descriptive or Quantitative Data required**  
Only descriptive data required: e.g. localization of protein xy in cell type z.  
Quantitative data required: e.g. comparison of protein localization / membrane architecture in TAC vs. Sham mice 4 weeks after intervention.

Information entered when creating a new request spans basic user information as well as a description of the experiment goals and parameters.

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During consultation phase, more in-depth information about the planned imaging procedure are captured. Antibody data from the Antibody Catalogue is referenced to describe and document the prepared stainings.

 Dual Immunofluorescence Stainings

[+ Add new](#)


Short name for label: SUR1 PKM 86

| 1 | primary antibody  | dilution | secondary antibody   | dilution |
|---|---|----------|--|----------|
|   | <b>Antigen Symbol:</b> ABCC8 <b>Name:</b> SUR1<br><b>Raised in:</b> mouse <b>Catalog No.:</b> 73-267<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-primary-53</span> | 1:200    | <b>Antigen Symbol: Name:</b> Abberior STAR 635P goat anti-mouse<br><b>Raised in:</b> Goat <b>Catalog No.:</b> 2-0002-007-5<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-secondary-647</span> | 1:1000   |
|   | <b>Antigen Symbol:</b> PKM2 <b>Name:</b> Pyruvatekinase<br><b>Catalog No.:</b> 15821-1-AP<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-primary-678</span>           | 1:1000   | <b>Antigen Symbol: Name:</b> Abberior STAR 580 goat anti-mouse<br><b>Raised in:</b> Goat <b>Catalog No.:</b> 2-0002-005-1<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-secondary-649</span>  | 1:1000   |
|   | -   | -        | -  | -        |

Short name for label: SUR1 ENO1 84

| 2 | primary antibody  | dilution | secondary antibody   | dilution |
|---|---|----------|--|----------|
|   | <b>Antigen Symbol:</b> ABCC8 <b>Name:</b> SUR1<br><b>Raised in:</b> mouse <b>Catalog No.:</b> 73-267<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-primary-53</span>               | 1:200    | <b>Antigen Symbol: Name:</b> Abberior STAR 635P goat anti-mouse<br><b>Raised in:</b> Goat <b>Catalog No.:</b> 2-0002-007-5<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-secondary-647</span> | 1:1000   |
|   | <b>Antigen Symbol:</b> Eno1 <b>Name:</b> Alpha Enolase<br><b>Raised in:</b> rabbit <b>Catalog No.:</b> LS-C482249<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-primary-681</span> | 1:500    | <b>Antigen Symbol: Name:</b> Abberior STAR 580 goat anti-rabbit<br><b>Raised in:</b> goat <b>Catalog No.:</b> 2-0012-005-8<br><span style="background-color: #e0ffe0; border-radius: 5px; padding: 2px;">umg-sfb1002-antibody-secondary-650</span> | 1:1000   |
|   | -   | -        | -  | -        |

Furthermore, samples used in the imaging workflow will be documented.

 Samples

[+ Add new](#)

| 1             |                    |
|---------------|--------------------|
| Serial #      | 00017              |
| Species       | mouse m            |
| ID            |                    |
| Type          | atrial myocytes AM |
| Genotype      | Wild Type WT       |
| Treatment     |                    |
| Staining type | IF IF              |

| 2        |         |
|----------|---------|
| Serial # | 00018   |
| Species  | mouse m |


## Supplement 1: menoci Graphical Guide

The specific setup at the local Göttingen ALMN facility enables users to print labels for the actual microscopy coverslips. Labels contain a barcode that resolves to a Handle.net registered PID with is unique for each printed label and refers back to the ALMN project.

### Manage Request 1063

Advanced Light Microscopy > Manage Requests > Manage

Request Overview Consultation **Coverslip Lables** ALM Images Comments and Log

 On this page you can prepare printable labels to be attached to coverslips. Select a defined sample and staining. Provide the number of coverslips for every sample-staining combination. Then click on the "Add new labels" button to add the new labels to the List. Select labels and click on "Print selected". The created csv-file can be used to print the labels with the S02 label printer. Attention: Please do not edit / modify the csv file to avoid broken or incorrect hyperlinks redirecting to the Research Data Platform.

Sample: 00017\_m\_AM\_WT\_IF coverslips: 1 Staining ID: SUR1 PKM 86 + Add new Labels

Print selected Hide selected Delete selected

| <input type="checkbox"/> | sample              | staining                          |
|--------------------------|---------------------|-----------------------------------|
| <input type="checkbox"/> | 00017_m_AM_WT_IF_06 | SUR1 PKM 86 <span>printed</span>  |
| <input type="checkbox"/> | 00017_m_AM_WT_IF_07 | SUR1 ENO1 84 <span>printed</span> |
| <input type="checkbox"/> | 00017_m_AM_WT_IF_08 | SUR1 ENO3 64 <span>printed</span> |
| <input type="checkbox"/> | 00017_m_AM_WT_IF_09 | SUR1 ENO3 65 <span>printed</span> |



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## 4. Upload of result data

As soon as the microscopic imaging has been performed, users may upload datasets for result documentation and original data preservation. Data uploaded is stored directly in an instance of the CDSTAR storage service that is managed by the Göttingen Campus scientific data centre in case of the CRC1002. Users do not have to put in further effort to store and archive their original data in this setup.

Data uploaded can be accessed by the owner, downloaded, deleted. General access rights may be set according to the common menoci „Sharing levels“ (public, site, group, private).

| Identifier     | Dataset  | Files | Upload date         | Uploaded by | Visibility | Actions                             |
|----------------|--|-------|---------------------|-------------|------------|-------------------------------------|
| alm01-00017-06 | 00017 06 AM WT [redacted] PK [redacted] 36.zip | 20    | 2019.09.24 16:37:20 | [redacted]  | Group      | [eye icon] [lock icon] [trash icon] |
| alm01-00017-08 | 00017 08 AM WT [redacted] SUR3 64.zip          | 13    | 2019.09.24 16:37:46 | [redacted]  | Public     | [eye icon] [lock icon] [trash icon] |
| alm01-00018-10 | 00018 10 Am SUR1 KO SUR [redacted] v3.zip      | 24    | 2019.09.24 16:39:02 | [redacted]  | Public     | [eye icon] [lock icon] [trash icon] |

Uploaded data is assigned a Handle.net PID and can be further shared with researchers from specific other research groups within the menoci instance. Previews of uploaded XML and image files are provided.

General Information

Owner: [redacted]  
Request ID: 1063  
Persistent Identifier: [10.111124/alm01-00018-10](https://doi.org/10.111124/alm01-00018-10)  
Public

Download complete dataset: 00018 10 Am SUR1 KO SUR [redacted] v3.zip

Share Dataset

Research Group:  [refresh] [Share] [Revoke]

Dataset is shared with:

XML Files ---






Image Files ▾

- 00018 10 Am SUR1 KO SUR [redacted] 498.26 KB [download]
- 00018 10 Am SUR1 KO SUR [redacted] Comp.tif [2 MB] [download]
- 00018 10 Am SUR1 KO SUR [redacted] 1b Conf 400x400.tif (469.04 KB) [download]
- 00018 10 Am SUR1 KO SUR [redacted] Comp.tif [2 MB] [download]
- 00018 10 Am SUR1 KO SUR [redacted] 01b Conf Membrane.tif (29.58 KB) [download]
- 00018 10 Am SUR1 KO SUR [redacted] 1d STED Comp.tif [2 MB] [download]
- 00018 10 Am SUR1 KO SUR [redacted] 1d STED Surface.tif (29.6 KB) [download]
- 00018 10 Am SUR1 KO SUR [redacted] Comp.tif [2 MB] [download]

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Using the registered Handle.net PID, metadata about the ALMN project is publicly accessible. If uploaded data has been designated „public“ by the user, files may be downloaded by non-authorized users.

For example, visit: <http://hdl.handle.net/21.11124/alm01-00017-06>

 Research Data Platform     Login

---

# ALM Request

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## Overview



Dear Visitor,  
this is the research data management system for the Advanced Light Microscopy Service Unit (S02) of the Collaborative Research Center 1002, "Modulatory Units in Heart Failure".  
The following is a shortened public representation of the dataset you requested by accessing this page. If you are entitled to full access, please log into the system.  
If you are otherwise interested to get full access to the dataset, please contact the responsible researcher.  
— Your S02 team (Stephan Lehnart, Tobias Kohl, Jörn Wegener, Greg Antonios, Eva Wagner)

Advanced Light Microscopy  
**SERVICE**<sub>02</sub>

## Researcher

|                |  |
|----------------|--|
| State          | Running  |
| User name      | [REDACTED]                                       |
| Name           | [REDACTED]                                       |
| Position       | Masterstudent                                    |
| Institute      | Cellular Biophysics and Translational Cardiology |
| Research Group | AG Lehnart                                       |
| Project        | S01 Disease Models                               |
| E-mail         | [REDACTED]                                       |
| Phone          | [REDACTED]                                       |

## Microscopy Datasets

|   |
|---|
|  Coverslip Label: alm01-00017-08 |
|  Coverslip Label: alm01-00018-10 |

## 5. Registration of published article

As soon as research results have been published with a scientific journal or uploaded to a preprint server, articles can be added to the menoci Published Data Registry for the project.

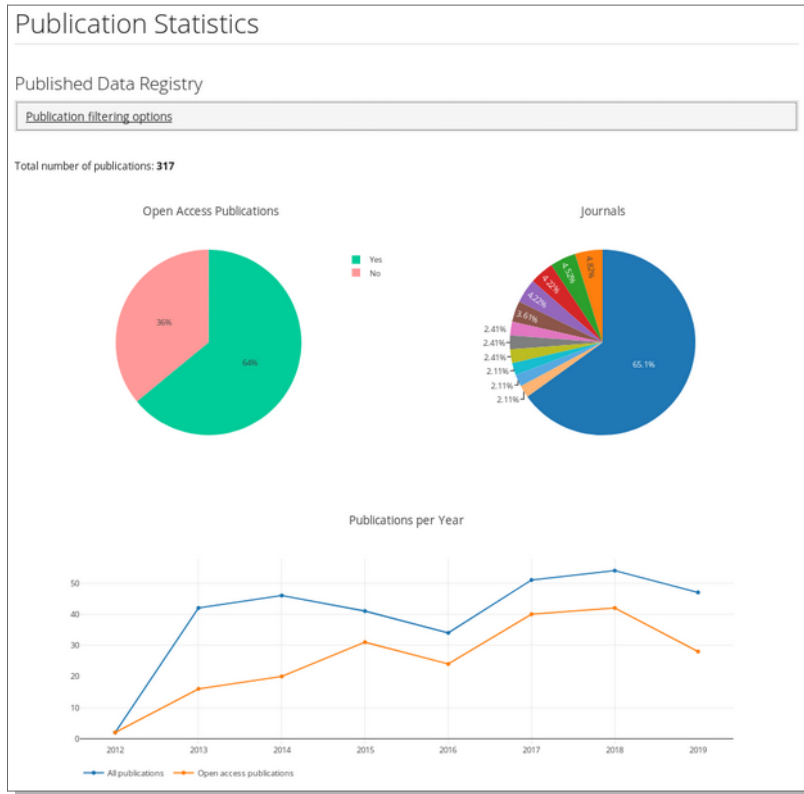
Initially, an overview of all registered articles is displayed with relevant information at a glance, including DOI, PubMed IDs.

The screenshot displays the 'Published Data Registry' interface. At the top, there is a navigation bar with the 'Research Data Platform' logo and several icons. Below the navigation bar, the title 'Published Data Registry' is prominently displayed. A search and filter bar is located below the title. To the right of the search bar, there are buttons for 'RIS-Export (All)', 'JSON-Export (All)', 'Excel-Export (All)', and 'Publication Statistics'. Below the search bar, a table lists the registered articles. The table has columns for Title, Authors, Journal, Publication year, DOI, and PMID. Each row includes a 'show all' button and an 'Edit' button. At the bottom of the table, there is a pagination control showing page 1 of 9, with 'next' and 'last' buttons. A '+ Create New Publication' button is visible at the bottom left of the interface.

| Title   | Authors   | Journal                                      | Publication year | DOI                          | PMID     |
|---|---|--|------------------|------------------------------|----------|
| Troponin destabilization impairs sarcomere-cytoskeleton interactions in iPSC-derived cardiomyocytes from dilated cardiomyopathy patients  | Dai Y, Amenov A, (...), Ebert A                         | Scientific Reports                           | 2020             | 10.1038/s41598-019-56597-3   | 31937807 |
| Epigenetic gene-expression links heart failure to memory impairment   | Islam R, Lbik D, (...), Fischer A                       | bioRxiv.org                                  | 2020             | 10.1101/2020.01.22.915637    |          |
| COA6 facilitates cytochrome c oxidase biogenesis as thiol-reductase for copper metallochaperones in mitochondria  | Pacheu-Grau D, Wasilewski M, (...), Rehling R           | Journal of Molecular Biology                 | 2020             | 10.1016/j.jmb.2020.01.036    | 32061935 |
| Interdisciplinary Research on Aortic Valve Stenosis: a Longitudinal Collection of Biospecimens and Clinical Data of Patients Undergoing Transcatheter Aortic Valve Replacement                  | Beuthner BEC, Topci R, (...), Nussbeck SY               | Open Journal of Bioresources                 | 2020             | 10.5334/ojb.65               |          |
| Impact of myocardial fibrosis on left ventricular remodelling, recovery, and outcome after transcatheter aortic valve implantation in different haemodynamic subtypes of severe aortic stenosis | Puls M, Beuthner BE, (...), Hasenfuß G                  | Eur Heart J                                  | 2020             | 10.1093/eurheartj/ehaa033    | 32049275 |
| menoci: Lightweight Extensible Web Portal enabling FAIR Data Management for Biomedical Research Projects  | Suhr M, Lehmann C, (...), Nußbeck SY                    | arXiv.org/Computer Science/Digital Libraries | 2020             |                              |          |
| Tissue Engineered Heart Repair from Preclinical Models to First-in-Patient Studies  | Zimmermann W  | Current Opinion in Physiology                | 2020             | 10.1016/j.cophys.2020.02.001 |          |
| Granulins Regulate Aging Kinetics in the Adult Zebrafish Telencephalon  | Zambusi A, Burhan ÖP, Di Giaimo R, Schmid B, Ninkovic J | Cells  | 2020             | 10.3390/cells9020350         | 32028681 |
| Functions of Vertebrate Ferlins   | Bulankina AV, Thoms S                                   | Cells  | 2020             | 10.3390/cells9030534         | 32106631 |
| Inhibition of NaV1.8 Prevents Atrial Arrhythmogenesis in Human and Mice   | Pabel S, Ahmad S, (...), Sossalla S                     | Basic Research in Cardiology                 | 2020             | 10.1007/s00395-020-0780-8    | 32078054 |

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Furthermore, basic live statics of the project publication record are publicly available.




Creating a new entry to the Published Data Registry can be streamlined if the article is already published and assigned a DOI or PubMed ID.

Otherwise, relevant metadata must be inserted using a basic web form.

**PubMed and CrossRef data-import**

To import publication data from PubMed based on PubMed-ID just enter the ID below or import from CrossRef based on DOI. The import data will replace all entries made in the Fields-section below.

PubMed-ID or CrossRef DOI

 Import publication data

Enter the properties in fields below

Working Groups \*

Subprojects

Open Access  
Unknown

Publication Type \*  
-- select publication type --

PMID

DOI

Publication Year

Title

Journal

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Once completed, inserted article information is publicly visible at the website. Additional information may be inserted according to instance configuration under the “External Resources” section. This may be used to refer to supplemental material, biomaterial accession numbers at public data repositories, or any other kind of URL-identifiable resource.

Publication

Edit

| Property             | Value   |
|----------------------|---|
| Working Groups       | AG Hasenfuß,  AG Toischer   |
| Subproject           | D01, D04, INF   |
| Open Access          | Yes   |
| Publication Type     | Journal Article   |
| PMID                 | <a href="#">32049275</a>  |
| DOI                  | <a href="https://doi.org/10.1093/eurheartj/ehaa033">10.1093/eurheartj/ehaa033</a>   |
| Publication Year     | 2020  |
| Title                | Impact of myocardial fibrosis on left ventricular remodelling, recovery, and outcome after transcatheter aortic valve implantation in different haemodynamic subtypes of severe aortic stenosis |
| Journal              | Eur Heart J   |
| ISSN                 | 0195-668X   |
| ESSN                 |   |
| URL                  | <a href="http://dx.doi.org/10.1093/eurheartj/ehaa033">http://dx.doi.org/10.1093/eurheartj/ehaa033</a>   |
| Pages                |   |
| Issue                |   |
| Volume               |   |
| Journal Abbreviation |   |
| Extra                |   |
| Authors              | Puls M, Beuthner BE, Topci R, Vogelgesang A, Bleckmann A, Sitte M, Lange T, Backhaus SJ, Schuster A, Seidler T, Kutschka I, Toischer K, Zeisberg EM, Jacobshagen C, Hasenfuß G                  |
| First Author         | Puls M  |
| Last Author          | Hasenfuß G  |
| Scholia              | <a href="#">Wikidata-based representation at Scholia</a>  |

External Resources

- ^ v 9606 NCBI taxonomy (Homo sapiens)
- ^ v 0000-0001-5540-1264 ORCID identifier (Miriam Puls)
- ^ v 0000-0002-0052-8089 ORCID identifier (Bo Eric Beuthner)
- ^ v 0000-0003-1508-1125 ORCID identifier (Andreas Schuster)
- ^ v 0000-0001-5184-0497 ORCID identifier (Elisabeth Maria Zeisberg)
- ^ v SCR\_001905 SciCrunch identifier (RRID:SCR\_001905, R Project for Statistical Computing)
- ^ v SCR\_015807 SciCrunch identifier (RRID:SCR\_015807, GraphPad Prism)
- ^ v academic...y-data Supplemental material

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Suhr M, Lehmann C, Bauer CR, Bender T, Knopp C, Freckmann LK, Öst Hansen B, Henke C, Aschenbrandt G, Kühlborn LK, Rheinländer S, Weber L, Marzec B, Hellkamp M, Wieder P, Sax U, Kusch H, Nussbeck SY

## 6. Documentation of original data related to publications

Published article information can finally be enriched by providing references to original experimental resources like Antibodies as well as microscopy imaging result data.

Authorized users are presented with searchbars that allow item search and selection:

Linked Antibodies

Linked Antibodies

umg-sfb1002-antibody-primary-39 - GABABR1  
**Type:** primary  
**Antigen Symbol:** GABBR1  
**Antibody Registry ID:**  
**Catalog No:** 73-183  
**Raised in:** Mouse

umg-sfb1002-antibody-primary-40 - GABABR2

Linked Cellmodels

Linked Echo-Studies

Such linked resources will in turn be publicly displayed at the article page:

Linked Antibodies

| PID                              | AG | Type    | Antigen symbol | Antibody Registry ID | Name  |
|----------------------------------|----|---------|----------------|----------------------|---|
| umg-sfb1002-antibody-primary-193 |    | primary | RYR2           | AB_2183054           | Ryanodine Receptor 2                        |
| umg-sfb1002-antibody-primary-922 |    | primary |                | AB_1163685           | IgG1 Isotype Control from murine myeloma    |
| umg-sfb1002-antibody-primary-923 |    | primary | PPP1CC         | AB_2299993           | PP1c  |
| umg-sfb1002-antibody-primary-924 |    | primary | PPP1R3A        |                      | PPP1R3A                                     |
| umg-sfb1002-antibody-primary-925 |    | primary |                | AB_737167            | normal goat IgG                             |
| umg-sfb1002-antibody-primary-926 |    | primary | PPP1R3A        | AB_11014462          | PPP1R3A                                     |
| umg-sfb1002-antibody-primary-927 |    | primary | PPP2CA         | AB_397909            | Purified Mouse Anti-PP2A Catalytic $\alpha$ |
| umg-sfb1002-antibody-primary-928 |    | primary | ATP2A2         | AB_325502            | SERCA2a                                     |
| umg-sfb1002-antibody-primary-929 |    | primary | CASQ2          | AB_2071461           | Calsequestrin                               |
| umg-sfb1002-antibody-primary-930 |    | primary | PLN            | AB_2252716           | Phospholamban                               |
| umg-sfb1002-antibody-primary-931 |    | primary | PLN            | AB_2617049           | Phospholamban (PLN, PLB) mAb (clone A1)     |

## 7. API-based metadata extraction

A feature currently under development is REST API based metadata extraction. Antibody and publication metadata may be retrieved as JSON documents based on schema.org vocabulary definitions.

Feel free to try and test the following examples:

```
curl https://sfb1002.med.uni-goettingen.de/production/antibodies/api/2/antibody/  
umg-sfb1002-antibody-secondary-649
```

```
0:  
  version: "2"  
  @context: "http://schema.org/"  
  @type: "Thing"  
  additionalType: "Antibody"  
  id: "649"  
  pid: "umg-sfb1002-antibody-secondary-649"  
  epic_pid: "https://hdl.handle.net/11022/umg-sfb1002-antibody-secondary-649"  
  research_group: "AG Lehnart"  
  lab_id: ""  
  type: "secondary"  
  antigen_symbol: ""  
  antibody_registry_id: ""  
  name: "Abberior STAR 580 goat anti-mouse"  
  alternative_name: ""  
  tag_fluorophore: "Abberior STAR 580"  
  raised_id: "Goat"  
  reacts_with: ""  
  clone: ""  
  isotype: "IgG"  
  clonality: ""  
  demasking: ""  
  antigen: "mouse antibodies"  
  company: "Abberior"  
  catalog_no: "2-0002-005-1"  
  lot_no: ""  
  description: "Abberior STAR 580 is the dye of choice for orange fluorescence. Moreover, the dye is particularly  
  designed and tested for 2-color STED microscopy in combination with Abberior STAR 635 or STAR  
  635P.\r\nThe dye can most effectively be depleted in STED microscopy at 700 to 775 nm.\r\n"  
  last_modified: "Wagner, Dr., Eva"
```

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```
curl -H "Accept: application/json"  
"https://sfb1002.med.uni-goettingen.de/production/literature/publications/201"
```

```
{  
  "@context": {  
    "@vocab": "https://schema.org/",  
    "dc": "http://purl.org/dc/elements/1.1/",  
    "pubtype": "https://www.nlm.nih.gov/mesh/pubtypes.html"  
  },  
  "@id": "https://sfb1002.med.uni-goettingen.de/production/literature/publications/201",  
  "@type": "ScholarlyArticle",  
  "pubtype": "Journal Article",  
  "creator": [  
    {  
      "@type": "Person",  
      "name": "Iyer LM"  
    }  
  ],  
  "datePublished": "2018",  
  "headline": "A context-specific cardiac  $\beta$ -catenin and GATA4 interaction influences TCF7L2 occupancy  
and remodels chromatin driving disease progression in the adult heart.",  
  "url": "https://sfb1002.med.uni-goettingen.de/production/literature/publications/201",  
  "sameAs": "http://dx.doi.org/10.1093/nar/gky049",  
  "identifier": [  
    {  
      "@type": "PropertyValue",  
      "name": "DOI",  
      "value": "10.1093/nar/gky049",  
      "sameAs": "http://dx.doi.org/10.1093/nar/gky049"  
    },  
    {  
      "@type": "PropertyValue",  
      "name": "PMID",  
      "value": "29394407",  
      "sameAs": "https://www.ncbi.nlm.nih.gov/pubmed/29394407"  
    }  
  ],  
  "dc:title": "A context-specific cardiac  $\beta$ -catenin and GATA4 interaction influences TCF7L2 occupancy  
and remodels chromatin driving disease progression in the adult heart.",  
  "dc:creator": "Iyer LM"  
}
```