Universität Basel

Faculty of Medicine

Universitätsspital Basel

RC2NB

ANNUAL REPORT

2021

RC2NB | Research Center for Clinical Neuroimmunology and Neuroscience Basel

About RC2NB

The Research Center for Clinical Neuroimmunology and Neuroscience Basel (RC2NB) is based on a non-profit foundation. It was founded in 2019 by the University Hospital Basel with participation of the University of Basel to continue and enhance the long-standing commitment and internationally renowned, clinically oriented research for patients with multiple sclerosis and other neuroimmunological diseases. RC2NB coordinates and supports several competitively funded research groups, dedicated to improving the clinical, imaging, biochemical, molecular, and cellular characterization of the disease process and understanding the benefits and side effects of newly developed therapies. Switzerland's largest MS center, the established high-quality patient cohorts coordinated from here, the local, national, and international networks as well as academic partner institutions and collaborating industry provide optimal conditions for RC2NB's mission. With its interdisciplinary team and its alignment of basic research, clinical research, and patient care, RC2NB aims at rapid translation of research results into advances of patient treatment and diagnosis. Main activities of RC2NB include the development of innovative digital biomarkers, the establishment of structures and expertise for managing and processing large volumes of highly complex data, and the application of cutting-edge analytic approaches, including artificial intelligence.

Vision

RC2NB's mission is to strengthen internationally recognized expertise and innovative research projects and complement them with the development and validation of digital biomarkers and innovative methods of information processing and artificial intelligence.

Mission

Improving the life of people with MS and neuroimmunological diseases through the development of innovative tools that comprehensively characterize the disease process, facilitate the development and implementation of better treatments and enable personalized disease management.

Contents

1 | Introduction

The year 2021 was marked by the implementation of the new structures within the centre and the coordination with internal and external partner institutions and groups. In parallel, important milestones were achieved in all three workstreams. A few may be mentioned here as representative:

In **Workstream 1**, the completion and evaluation of the feasibility study for dreaMS, which formed an important basis for the recognition of the dreaMS App as "software as medical device" by Swissmedic and the EU. All necessary preparations for the first large two-year validation study for dreaMS with participants of the Swiss MS cohort study are completed with approval by the competent authorities in November 2021. The completion of the technical fine-tuning for dreaMS and the digital platform and the inclusion of the first patients is foreseen in the course of the first quarter of 2022.

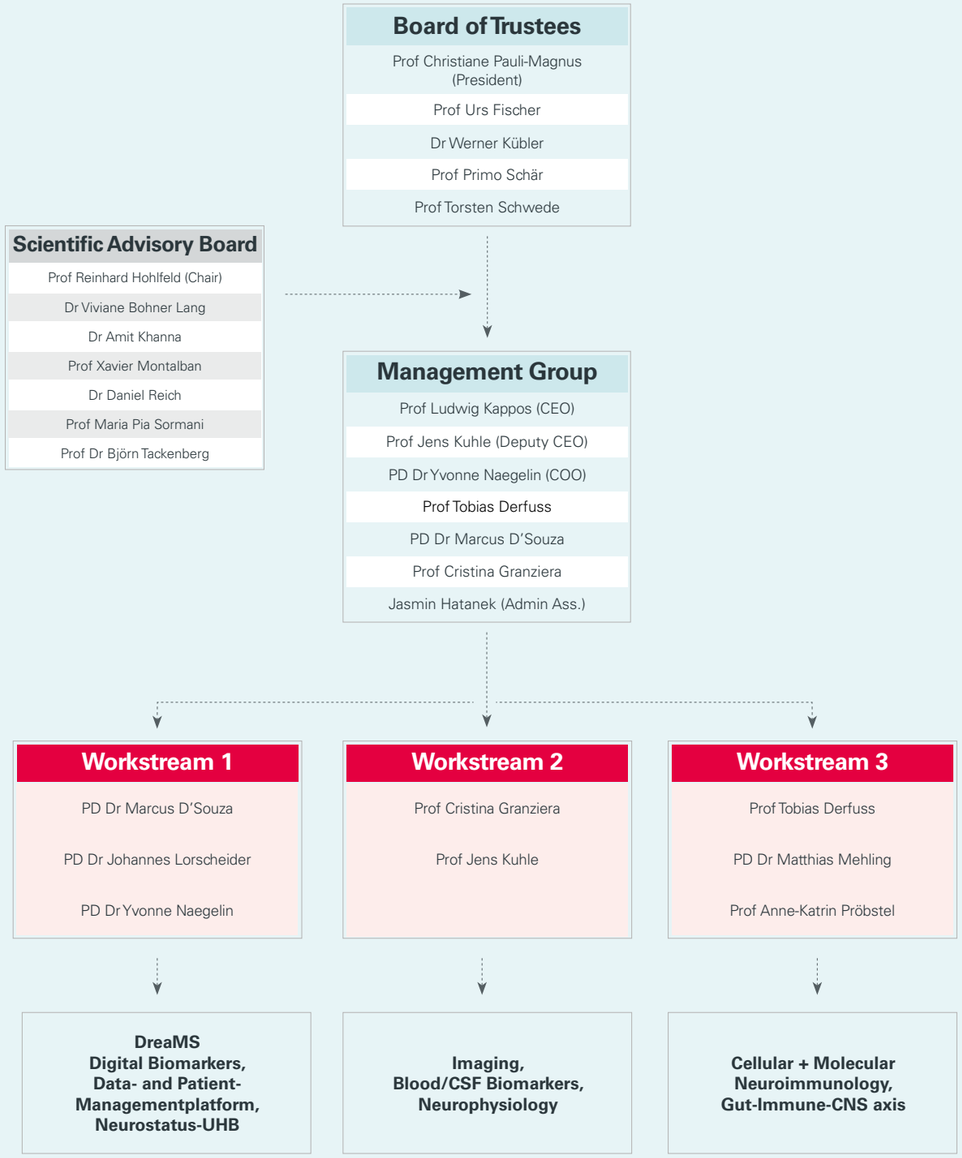
In **Workstream 2**, important prerequisites for the application of Neurofilament Light (NfL) Chain as a blood-based biomarker for MS in daily practice were created with the validation of the modelling of z-values for NfL in two large, independent MS cohorts. Important publications underline the progress made in developing innovative methods for better tissue characterisation in neuroimaging.

In **Workstream 3**, in addition to contributions to a better understanding of the effects and side effects of immunotherapeutics, we can report important highlights with the award of an Excellence Professorship to Anne-Katrin Pröbstel and the establishment of her research group in the Department of Biomedicine. Number and quality of publications, various scientific prizes and mandates in national and international organisations provide further evidence of the productivity and recognition of the researchers joining forces in and with the RC2NB. The continued support from the University Hospital, the University, national and international research institutions and from our sponsors and cooperation partners in industry constitutes an important prerequisite and motivation of further progress!

Ludwig Kappos
CEO

2 | Governing Bodies

2.1 | Organizational Chart



2 | Governing Bodies

2.2 | Board of Trustees

Members

Prof Christiane Pauli-Magnus (President of the Board, Head of Department of Clinical Research, University Hospital Basel)
Prof Urs Fischer (Chairman Neurology, University Hospital Basel)
Dr Werner Kübler (CEO University Hospital Basel)
Prof Primo Schär (Dean Medical Faculty, University of Basel)
Prof Torsten Schwede (Vice-president Research, University of Basel)

The Board of Trustees held two meetings, on 20 January 2021 and 26 August 2021.

2.3 | Scientific Advisory Board

Members

Prof Reinhard Hohlfeld (Chair), Munich, Germany
Dr Viviane Bohner Lang (Patient Representative), Allschwil, Switzerland
Dr Amit Khanna, Basel, Switzerland
Prof Xavier Montalban, Barcelona, Spain
Dr Daniel Reich, Bethesda, United States of America
Prof Maria Pia Sormani, Genova, Italy
Prof Björn Tackenberg, Basel, Switzerland

The international RC2NB Scientific Advisory Board (SAB) meets annually and independently reviews the work and provides advice to the RC2NB. The first and constituting meeting was held (virtually) on 16 June 2021.

Quote from the SAB report issued after this meeting:

„Together with support from industry, the sustained strong commitment of both the University Hospital and the University of Basel provides excellent conditions for ensuring continuation of the superb translational neuroimmunology research for which the MS center in Basel is known. The scope and quality of the presented projects is outstanding.

In particular, the SAB appreciates that most projects are already supported by competitively acquired external funding, testifying to the excellence of the projects and their PI´s. The SAB recommends that RC2NB uses its own resources to foster collaboration and synergies between the different groups of investigators.“

2.4 | Management Group

Members

Prof Ludwig Kappos, CEO, Workstream 1 and 2
Prof Tobias Derfuss, Workstream 3
PD Dr Marcus D'Souza, Workstream 1
Prof Cristina Granziera, Workstream 2
Prof Jens Kuhle, Deputy CEO, Workstream 2
PD Dr Yvonne Naegelin, COO, Workstream 1
Jasmin Hatanek, Management Assistant, Administration

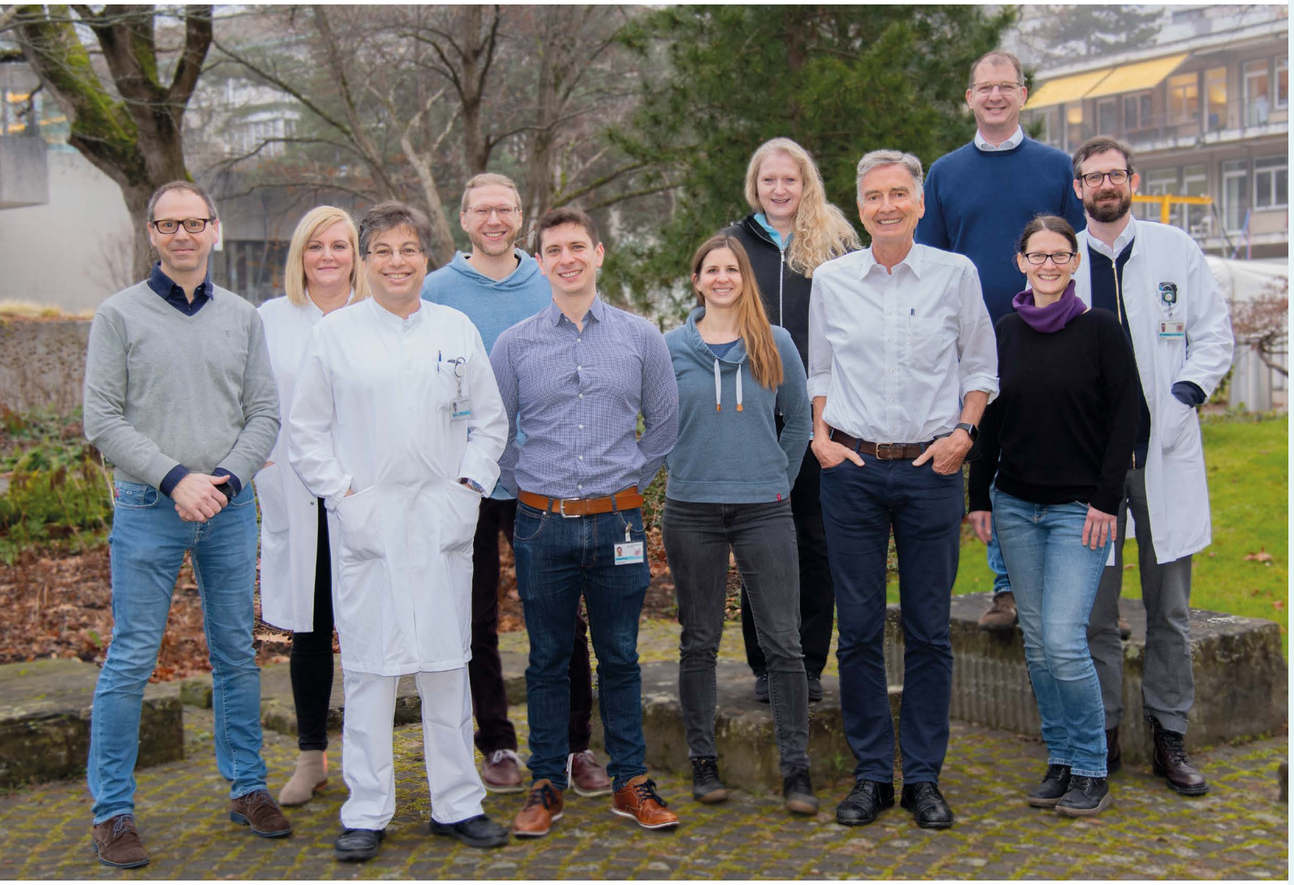
Members of the management group represent the three workstreams of RC2NB and meet monthly to facilitate continuous exchange on and coordination of ongoing and planned research projects.

3 | Scientific Achievements

Three workstreams - One vision

Three closely linked workstreams pursue the common goal of the RC2NB. Interdisciplinary teams collaborate within and across the workstreams to develop innovative tools for monitoring the health of patients with MS, better understand the disease process, enable personalized disease management, and find better treatments.

DreaMS Study Team – (from left to right): Corne de Jong (Healios), Nancy Wochnik, PD Dr Marcus d'Souza, Dr Tim Wölfle, Silvan Pless, Vera Müller, PD Dr Yvonne Naegelin, Prof Ludwig Kappos, Guilhem Dupont (Healios), Dr Andrea Wiencierz, PD Dr Johannes Lorscheider



3.1 | Workstream 1: Digital future

Research Group Leaders

PD Dr Marcus D'Souza (Neurostatus-UHB)

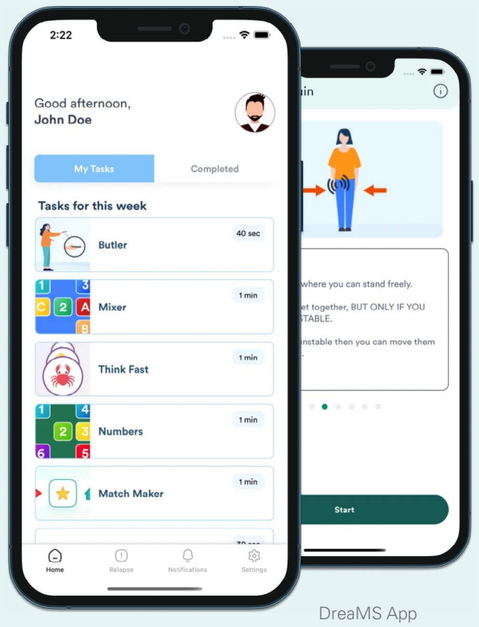
PD Dr Johannes Lorscheider (dreaMS)

PD Dr Yvonne Naegelin (dreaMS)

The goal of the project "dreaMS" (Yvonne Naegelin, MD and Johannes Lorscheider, MD) is to develop and validate digital biomarkers for people with Multiple Sclerosis (MS). The built-in sensors in today's smartphones allow differentiated analyses of movement patterns. At the same time, smartphones are broadly used on a daily basis and can therefore provide a more realistic picture of the activities of their owners than visits to the doctor's office, which are only semi-annual or annual. DreaMS uses a smartphone app for this purpose that provides measures of movement and fine motor skills but also visual function and cognition through specifically developed tasks ("challenges") and also assesses mood and quality of life. This app is developed in cooperation with the Basel-based company Healios Ltd, which specializes in software solutions in the field of "digital health". This cooperation for the development of the dreaMS App as a set of digital biomarkers for MS and other neuroimmunological diseases was initially supported by the Swiss Agency for Innovation (Innosuisse). The project also aims at creating a digital solution that allows the customized use and secure processing of information obtained with this application by people with MS, health care professionals and researchers in daily management and clinical research. This digital solution also allows the integration and common analysis of additional diagnostic and digital health tools as well as data from laboratory tests or neuroimaging for a comprehensive assessment of disease evolution and treatment effects. A first feasibility study (NCT04413032) was completed in 2021: in this study, dreaMS was tested for technical reliability, acceptance and meaningfulness in a group of MS patients and healthy volunteers. The pre-defined reliability criteria were met by 72 of 133 features extracted from the active tasks ("challenges") included in dreaMS. In ratings by the participants all challenges reached high scores for acceptance and meaningfulness for Multiple Sclerosis. Based on these results in May 2021 the dreaMS app obtained the qualification for software as class I medical device (SAMD) for Switzerland and the EU.

As next step in the development a large 2-year validation study (NCT05009160) with approx. 400 participants from the

Swiss MS cohort and a group of healthy volunteers was designed and approved by the institutional review board of northwestern Switzerland (EKNZ) and Swissmedic in November 2021. First patients will be included within the first quarter 2022. First discussions for the development of validated digital biomarkers to be accepted as endpoints in clinical trials were held with both the European Medicines Agency (EMA) in October and with the U.S. Food and Drug Administration (FDA) in November 2021. Both agencies appreciated and welcomed the concept of developing apps for assessing and monitoring disease symptoms in subjects with MS and acknowledged the interaction with RC2NB at a very early timepoint of development.



DreaMS App

Healios Ltd refined their in house procedures during the course of the project and as defined within our agreement establishing several ISO standards for ensuring to meet all standards for further regulatory approvals.

The research activities of Neurostatus-UHB are also part of workstream 1. In November 2021 Neurostatus-UHB was established as a public limited company (stock corporation under Swiss law) owned by the University Hospital. Activities of this spin-off include licensing the implementation and use of Neurostatus-EDSS and its digital version, the Neurostatus-eEDSS, in international corporate sponsored and academic clinical trials for MS and other neuroimmunological disorders. Neurostatus does also provide certification and training for users of the Neurostatus-(e)EDSS and engages in the development, testing and implementation of new digital clinical assessment and data capture tools for use by health care professionals. In 2021, Neurostatus-EDSS was licensed to 92 phase II/III MS trials, of which 30 are using the digital version. The digital Neurostatus-EDSS was developed and is provided in collaboration with three eCOA (electronical clinical outcome assessment) companies under non-exclusive Neurostatus-UHB licenses.

For clinical trials Neurostatus-eEDSS is provided in combination with a review and quality assessment service by an EDSS-Expert team. Income generated through these activities and licensing is used to support research activities coordinated by RC2NB.

3.2 | Workstream 2: Innovative imaging and analysis of body fluids

Research Group Leaders

Prof Cristina Granziera (advanced neuroimaging research –ThINk Basel)

Prof Jens Kuhle (Swiss MS Cohort Study and Body Fluid Biomarker Laboratory)

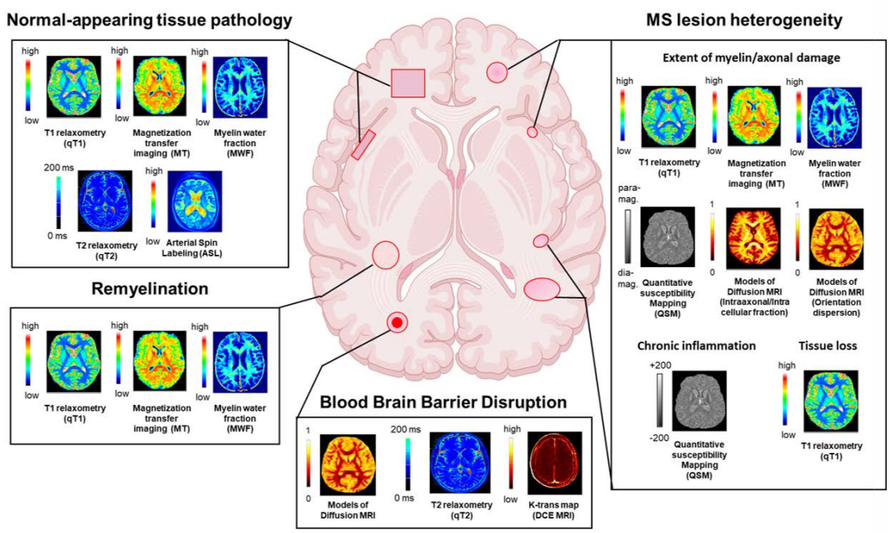
The year 2021 has been a very fruitful period for both Clinical Neuroimmunology/SMSC and the advanced neuroimaging group (ThINk Basel).

ThINk Basel has grown to a leadership role in the Basel area, in Switzerland and in the international neuroimaging and neurology community. Reflecting scientific achievements are 20 original research publications, co-authored or authored by ThINk members in highly ranked neurology and neuroimaging journals. In all those works, ThINk investigators exploited the sensitivity and specificity of advanced magnetic resonance imaging to identify new mechanisms of disease progression and brain repair in multiple sclerosis patients. In 2021, Cristina Granziera was awarded a 2-years prolongation of the Swiss National Fund Professorship with the project entitled "INsIDER-RAP: ImagiNg the Interplay between Axonal DamagE and Repair in Multiple Sclerosis – Remyelinating lesions And Pathways". ,In collaboration with PD Dr M. Bach Cuadra (University of Lausanne), Prof A. Depeursinge and Prof J. Henning (University of Applied Sciences Western Switzerland) C. Granziera is a co-PI of a project funded by the "Hasler Foundation" entitled " MSxplain- Explaining AI decisions in personalized healthcare: towards integration of deep learning into diagnosis and treatment planning for Multiple Sclerosis". In 2021, C. Granziera was elected secretary of the prestigious White Matter group at the International Society of Magnetic Resonance Imaging, and also co-president of the Medico-Scientific Advisory Board of the Swiss MS Society and member of the Executive Board of the Department of Biomedical Engineering at the University of Basel.

A central resource for our MS research is the Swiss Multiple Sclerosis cohort (SMSC; PI Jens Kuhle) which was founded in 2012 and comprises eight leading Swiss MS centers. It is one of the internationally largest MS research databases covering more than 1500 well characterised patients. Patients are followed every 6 or 12 months and high quality clinical, radiological as well as biological data are collected. Examinations are performed by Neurostatus certified raters and MRIs obtained according

to a predefined, standardized protocol in all participating centers. Central MRI analysis is done by ThINk Basel. More than 250’000 bodyfluid samples from 10’202 timepoints have been stored meanwhile. In 2021 the Clinical Neuroimmunology/SMSC group has relevantly contributed to international research on biomarkers in MS. We demonstrated that an intrathecal IgM synthesis (present in about 25 % of persons with MS (pwMS)) predicts a more active and severe disease course and an increased need of a high-efficacy disease modifying treatment (Ref. 79). We published work on generating a reference database for serum neurofilament light chain (sNfL) in more than 10000 serum samples from more than 5 000 control persons. The value of this normalised NfL metric (NfL Z score or percentile) for use in clinical practice was illustrated in two independent patient cohorts comprising >5’000 pwMS, the SMSC and the Swedish MS registry (Müller, Benkert, …Kuhle et al., Lancet Neurology 2022,). Members of the Clinical Neuroimmunology/SMSC team authored >60 peer reviewed publications in 2021 and - in addition to ongoing funding by the Swiss National Research Fund - received research grants from the Progressive MS Alliance and the Swiss MS Society. In 2021, J. Kuhle was elected as member of the Scientific Leadership group of the international registry MS Base and as president of the Scientific Research Grant Committee of the Swiss MS Society.

Brain imaging discloses different aspects of pathology in MS lesions and normal-appearing MS tissue



3.3 | Workstream 3: Recording and understanding the dysregulated immune system

Research Group Leaders

Prof Tobias Derfuss (Cellular and Molecular Neuroimmunology)

PD Dr Matthias Mehling (Immunosenescence, Protective Immunity under DMT)

Prof Anne-Katrin Pröbstel (Experimental Neuroimmunology)

The research group of Prof Tobias Derfuss at the Department of Biomedicine consists of two Postdocs, three PhD students and several master students. It receives funding from the Swiss National Science Foundation, public foundations as well as industry. The research is focused on three main topics: (I) Immunomonitoring of immune therapies in MS; (II) Relevance of B-cell receptor mediated antigen capture by B cells; (III) Discovery of new autoantibodies and functional testing of autoantibodies in neurological autoimmune diseases. Achievements in 2021 include:

1. Further elucidation of immune alterations during dimethylfumarate therapy (Diebold et al., in press Ann Neurol 2022), 2. Identification of a MS-associated B-cell population by CSF mass cytometry (Ref. 52); 3. Understanding the relevance of anti-SARS-CoV2 specific IgM and IgA antibodies on virus neutralization was investigated using recombinant human antibodies (Callegari et al. EMBO reports in revision); 4. B cell antigen capture in CNS was shown to be a trigger of autoimmunity in animal models using B-/T-cell receptor transgenic animals (Kim at al. unpublished); 5. Discovery of a differential IgM reactivity in the CSF of MS patients led to the identification of a novel autoantigen (Callegari et al. unpublished). 6. Using myasthenia as an exemplary autoantibody mediated disease cooperation of different autoreactive antibody clones was shown to be pathogenic by inducing clusters of acetylcholin receptors in the membrane (Rose et al., in preparation).

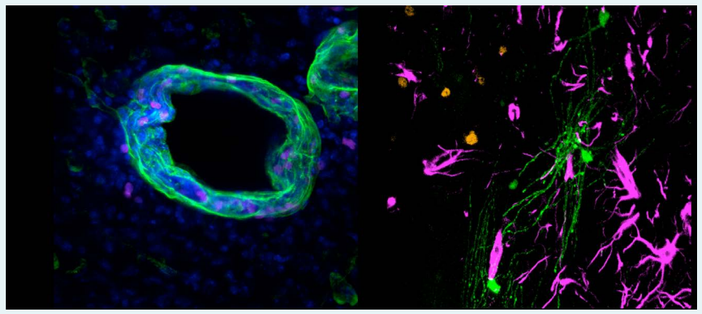
The new treatment options developed for the treatment of MS allow effective control of inflammatory disease activity. Although these drugs have rather specific immunomodulatory than broad immunosuppressive effects, functional immunological alterations and premature immunosenescence occur in susceptible patients. Against this background, the research group of PD Dr Matthias Mehling at the Department of Biomedicine has initiated in 2021 two studiesto assess the impact of DMTs on protective immunity in MS. The first study, organized together with Jens Kuhle, aims to determine the rate of confirmed SARS-CoV-2 infection and severity of COVID-19 in a cohort of MS patients and to quantify SARS-CoV-2-specific antibody response. The study is nested within the Swiss MS Cohort (SMSC). PCR-confirmed SARS-CoV-2 infections, severity of COVID-19 according to the WHO clinical progression scale and immunizations with SARS-CoV-2 vaccines were captured by questionnai-

res used for interviews every 6 or 12 months. Anti-SARS-CoV-2 spike protein and nucleocapsid antibody levels are determined by electrochemiluminescence immunoassay in sera of all participants. Between February 2021 and January 2022, study questionnaires were completed for 863 pwMS. In parallel, SARS-CoV2 serology for anti Nucleocapsid and anti-Spike IgGs was performed in 1137 samples. The group is currently analyzing these data also regarding breakthrough disease, asymptomatic infections and vaccine responses.

The second study aims at cross-sectionally quantifying cellular changes linked to the development of immunosenescence by high dimensional immuno-phenotyping including multi-color flow cytometry and multiplex cytokine measurement in the blood of pwMS followed in the SMSC. In 2021 the expression of cell surface markers linked to immunosenescence was measured in various T cell subsets of 240 pwMS. These data are currently analyzed and will be integrated computationally using machine learning with results of a study organized in our MS Center that retro- and prospectively quantifies severity of infections in pwMS. The aim of this multidisciplinary research project is to develop integrative algorithms to monitor treatment-associated immune deficiency in pwMS.

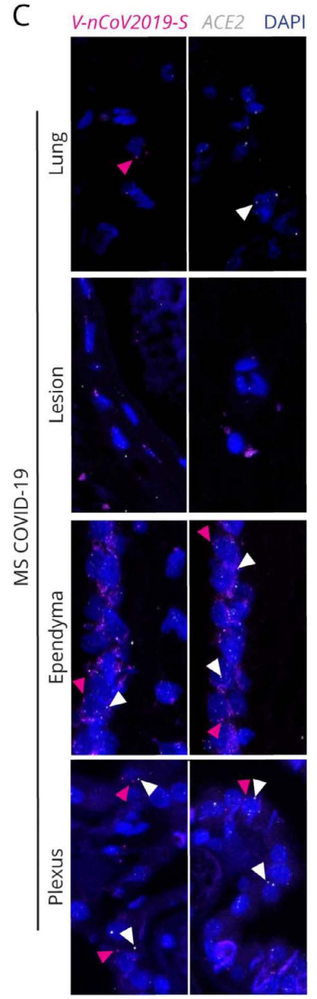
The research group "Experimental Neuroimmunology" of Prof Anne-Katrin Pröbstel at the Departments of Biomedicine and Clinical research was established in 2021 and is an interdisciplinary team of two postdocs, three PhD students, three MD doctoral students, one technician/lab manager, one bioinformatician, and two master students. The group is funded through an Eccellenza Professorship by the Swiss National Science Foundation (SNSF), the ERC (Horizon2020), the National Multiple Sclerosis Foundation, the Goldschmidt-Jacobson Foundation (Bed-to-Bench-for-Top Clinicians), the Propatient Foundation, intramural funding by the University of Basel as well as industry. The overall aim lies in understanding the functional diversity and specificity of B cells and their interaction with gut microbiota in central nervous system inflammation with a focus on MS, MOGAD, autoimmune encephalitis, and neurolupus.

The group strives to develop strategies to foster immune regulatory responses and achieve tailored depletion of immune cell subpopulations through targeted manipulation of the gut microbiome. Research in the group focuses on three main topics: (I) deciphering microbial-immune cell crosstalk in MS, (II) decoding pathogenic B cell and antibody profiles in MOGAD, (III) identifying microbial and immune signatures associated with treatment (non-)response.



B lymphocytes in the brain in acute inflammation. The left picture shows a blood vessel (green) in the brain, with B-lymphocytes (pink) in the vessel wall and in brain tissue surrounding the vessel. The right picture shows virus-infected nerve cells (green), astrocytes (pink) and B-lymphocytes (yellow) in the brain.

In 2021, microbial signatures associated with disease activity as well as with relevant side effects under immune modulating therapy in a patient subgroup were identified (Diebold et al. under review). Further, the group identified an immune trafficking signature in patients with MOGAD for which currently a therapeutic blocking antibody is evaluated in pre-clinical models (unpublished). Moreover, they discovered a novel mucosal originating autoantibody in a clinical distinct subgroup of patients with atypical demyelination (Gomes*, Kulsvehagen* et al. in preparation). Finally, they contributed to elucidating the immune pathology of Neuro-COVID 19 in MS and non-MS patients (Ref.38; 84; Etter et al. under review).In 2021, Prof Pröbstel received the Fritz-and-Ursula-Melchers B cell immunology award of the German Society of Immunology, and the the Ingrid-zu-Solms-Prize for Medicine for her work on B cells and antibodies and their interaction with microbiota in MS. She has been appointed as member of the scientific committee of the Fondation ARSEP, representative of the Swiss Neurological Society in the Multiple Sclerosis Scientific Panel of the EAN, member of the steering committee of the German Neurological Society for the "Guidelines on diagnosis and treatment of multiple sclerosis, neuromyelitis optica and MOGAD". Several members of her group are supported with prestigious fellowships by international and Swiss institutions.



Sars-CoV-2 transcripts in the choroid plexus of MS and non-MS COVID 19 patients but not in MS lesion areas

4 | Financial Statement

Financial Statement	2021
Research contributions	3'750'000.00
Other income	333'176.12
Total Income	**4'083'176.12**
Technical development incl. expenses for third party services	-1'304'270.21
Personnel	-798'372.45
Administration and other expenses	-127'646.78
Total Expenses	**-2'230'289.44**
Ordinary result for the period	**1'852'886.68**

Equity	2021
Equity as of 01.01.2021	1'429'186.02
Income 2021	4'083'176.12
Expenses 2021	-2'230'289.44
Equity as of 31.12.2021	**3'282'072.70**

Expenses by Cost Centers

	Workstream 1	Workstream 2	Workstream 3
Personnel	-231'793.22	-199'764.78	-48'894.00
Consumables and other lab services	-12'833.66	0.00	0.00
Technical development	-1'293'245.21	0.00	0.00
Administration and other expenses	-40'911.00	0.00	0.00
Total Expenses	**-1'578'783.09**	**-199'764.78**	**-48'894.00**

	Data Storage and Analysis	Management/ Administration	Total
Personnel	-134'636.52	-183'283.93	-798'372.45
Consumables and other lab services	0.00	0.00	-12'833.66
Technical development	0.00	0.00	-1'293'245.21
Administration and other expenses	-25'511.00	-59'416.12	-125'838.12
Total Expenses	**-160'147.52**	**-242'700.05**	**-2'230'289.44**

5 | Main Partnering Institutions and Research Support

University Hospital Basel

Universität Basel

Healios

NOVARTIS

Roche

euresearch

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Innosuisse – Schweizerische Agentur für Innovationsförderung

Swiss National Science Foundation

MS Schweizerische Multiple Sklerose Gesellschaft

6 | Members and Collaborators of RC2NB by Workstreams

Workstream 1

Research Group Leaders

PD Dr Marcus D'Souza (Neurostatus-UHB)
PD Dr Johannes Lorscheider (dreaMS)
PD Dr Yvonne Naegelin (dreaMS)

Group Members and Collaborators

dreaMS and digital solution:

Melanie Lacalamita (study nurse)
Marko Obradovic, MSc (software engineer)
Vera Müller, MSc (study coordinator)
Silvan Pless, MSc (neuropsychologist, PhD candidate)
Nancy Wochnik (study nurse)
Dr Tim Wölfle, MSc (physician-scientist, PhD candidate)
(Employees of Healios Ltd. not individually mentioned)

Neurostatus-UHB:

Neurostatus-UHB:
Dr César Álvarez-González (neurologist)
Elena Börlin (IT specialist)
Lea Meret Brugger (student)
Dr Ilaria Callegari (neurologist)
Esther Maria Fricker (operations)
Dr Nuria Alicia Cerdá Fuertes (neurologist)
Eddy Angela Garcia Gorostiaga (operations)
Joel Götti (student)
Gabriel Simon Hug (student)
Dr Christian Kamm (neurologist)
Dr Giulia Mallucci (neurologist)
Svetlana Orlova (IT specialist)
Thomas Trouillet (programmer)
Colleen Waiz (operations)
Andrea Zimmer (study coordinator)

Workstream 2

Research Group Leaders

Prof Cristina Granziera (advanced neuroimaging research – ThINk Basel)
Prof Jens Kuhle (Swiss MS Cohort Study and Body Fluid Biomarker Laboratory)

Group Members and Collaborators

ThINk Basel
Prof Cristina Granziera team:
Dr Muhamed Barakovic (Postdoc)
Dr Alessandro Cagol (Postdoc)
Xinjie Chen (PhD candidate)
Riccardo Galbusera (PhD candidate)
Dr Lester Melia Garcia (senior researcher)
Osman Hatipoglu (master student)
Selina Leber (master student)
Marguerite Limberg (research assistant)
Po-Jui Lu (PhD candidate)
Dr Jannis Müller (Postdoc)
Reza Rahmanzadeh (PhD)
Dr Esther Ruberte (senior researcher)
Dr Gretel Sanabria Diaz (Postdoc)
Aida Suljakovic (personal assistant)
Dr Niena Siebenborn (neuroradiologist)
Sabine Schädelin, MSc (statistician)
Igor Schneider (master student)
Dr Alexandra Todea (neuroradiologist)
Dr Charidimos Tsagkas (Postdoc)
Dr Matthias Weigel (senior researcher)
Antonia Wengner (master student)

PD Dr Athina Papadopoulou team:
Dr Cesar Alvarez (MD)
Dr Katerina Ebner (MD)
Dr Nuria Cerde Fuertes (MD)
Dr Jenni Kuhlmann (MD)

PD Dr Regina Schläger team:
Valentina Crepulja (master student)
Eva Kesenheimer (PhD candidate)
Dr Laura Sander (MD)
Dr Janina Wendebourg (PhD candidate)

PD Dr Oezguer Yaldizli team:
Dr Jannis Müller (Postdoc)

PD Dr Katrin Parmar team:
Dr Charidimos Tsagkas (Postdoc)

Swiss MS Cohort Study and Body Fluid Biomarker Laboratory
Prof Jens Kuhle team:
Dr Pascal Benkert (statistician)
Caroline Brunner (study nurse)
Lilian Demuth (study coordinator)
Leila Develioglu (technician)
Melanie Lacalamita (study nurse)
Prof David Leppert (senior Postdoc)
Marguerite Limberg (study nurse)
Aleksandra Maleska, MSc (bioengineer)
Stephanie Meier (PhD candidate)
Dr Johanna Oechtering (senior neurologist/Postdoc)
Dr Annette Orleth (Postdoc)
Miriam Rhyner (study nurse)
Monica Röthlisberger (study nurse)
Sabine Schaedelin, MSc (statistician)
Suvitha Subramaniam, MSc (data scientist)
Dr Eline Willemse (Postdoc)
Nancy Wochnik (study nurse)
PD Dr Oezguer Yaldizli (senior neurologist/Postdoc)

Workstream 3

Research Group Leaders

Prof Tobias Derfuss (Cellular and Molecular Neuroimmunology)
PD Dr Matthias Mehling (Immunosenescence)
Prof Anne-Katrin Pröbstel (Experimental Neuroimmunology)

Group Members and Collaborators

Prof Tobias Derfuss team:

Dr Ilaria Callegari (PhD candidate)
Sebastian Holdermann, MSc (PhD candidate)
Hye-In Kim, MSc (PhD candidate)
Dr Nicholas Sanderson (Postdoc)
Mika Schneider, BSc (master student)
Dr Edoardo Galli (Postdoc)

PD Dr Matthias Mehling team:

Mali Coray (MD-PhD candidate)
Dr Varenka Epple (MD)
Annika Frentzel, BSc (master student)
Dr Jakob Fuhrmann (MD)
Dr Klara Ivanek (Postdoc)
Melanie Kaech, BSc (master student))

Prof Anne-Katrin Pröbstel team:

Prof Anne-Katrin Pröbstel team:
Tim Dürrenberger (doctoral student)
Dr Julia Flammer (resident/Postdoc)
Vidmante Fuchs (master student)
Ana Beatriz Gomes (PhD candidate)
Laila Kulsvehagen (PhD candidate)
Anne-Cathérine Lecourt (lab manager/technician)
Luc Lutz (master student)
Elisabeth Pössnecker (PhD candidate)
Laura Rieder (master student)
David Schreiner (bioinformatician)
Dr Lena Siewert (Postdoc)

7 | Publications in peer reviewed journals

1. Abboud H, Salazar-Camelo A, George N, Planchon SM, Matiello M, Mealy MA, Goodman A; **Pröbstel AK** (member of the Guthy-Jackson Foundation NMO International Clinical Consortium) On-behalf of the Guthy-Jackson Foundation NMO International Clinical Consortium. Symptomatic and restorative therapies in neuromyelitis optica spectrum disorders. J Neurol. 2021 Sep 5.

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