



Institute for Arthritis Research
Institut für Rheumaforschung
Institut pour la recherche en rhumatologie

ANNUAL REPORT 2015/2016

Institute for Arthritis Research (iAR)

Turning Research into clinical application for Arthritis care

Rheumatology
in movement



FOREWORD BY THE CHAIRMAN

PROFESSOR DR. CEM GABAY

Our organisation, the Institute for Arthritis Research (iAR) is now eight years old. It was created to support research in rheumatic and musculoskeletal disorders and more generally the mechanisms associated with inflammatory responses. The four institutions (the Universities of Geneva, Lausanne and Zurich, and the Laboratory in Ticino) have benefitted from the generosity of donors which enabled us to support many projects in basic research (more details later in this report). Furthermore, the organisation supported the training of young researchers, the establishment of a new group led by a young professor in Geneva, as well as scientific exchange at an annual symposium, which is open to both young researchers and established scientists. Finally, our association has also supported congresses and conferences.

In this past year, we have decided to move towards an axis of translational research which involves the development of anti-inflammatory therapies using the knowledge and expertise acquired through the basic research. For this activity, we are collaborating with a startup company called AIDD which is based in the Lake Geneva basin, and with other organisations in both Switzerland and Europe. This strategy is founded on our determination to create links between our laboratory research and clinical applications which will directly benefit patients.

In the context of our activities to acquire more visibility and attract the resources necessary for our activities we are very happy to welcome Judith Safford to our organisation, who will be supporting our communication and fundraising activities. Her extensive experience acquired during many years working for non-profit organisations will certainly benefit iAR.

Certain members of our association, although they are still working actively as scientists, will reach retirement age in the next years. Therefore, when thinking about the future development of the iAR, it is vital to plan the inclusion of new members in the coming years, in order to guarantee that the objectives of the organisation are upheld over time.

Finally, our work would not be possible without the funding from foundations and other charitable funds. We thank all those who make our work possible.



Professor Cem Gabay
Chairman

Geneva, March 2017

WHAT IS iAR? VISION, OBJECTIVES AND ACHIEVEMENTS

The Institute of Arthritis Research (iAR) was established in Lausanne in 2009 as a non-profit, tax-exempted association under Swiss law. The organisation was initiated and first led by the late Prof. Jürg Tschopp with a starting donation of 10 million CHF paid over five years. Its founding members are four Swiss laboratories in the field of arthritis research and immunology. The current Chairman is Prof. Cem Gabay from the University of Geneva, Division of Rheumatology. Vice-Chairman is Prof. Steffen Gay from the University of Zurich, who has recently been appointed by the European Council into the Scientific Panel of Health (SPH).

The Institute of Arthritis Research creates the unique opportunity in Switzerland to conduct interdisciplinary research combining the work of basic research groups as well as laboratories linked to clinical Departments. It thus enables cross-feeding between Swiss University research centres, which benefits both the research and the training of students and junior scientists.

The main objective of the iAR is to enable the transfer of basic research in the laboratory to translational opportunities and clinical applications, such as preventive measures, tools for diagnosis and therapeutic measures, with the aim to directly benefit patients suffering from rheumatic diseases.

The achievements of iAR include:

- The development of a research network in Switzerland with collaborative research projects and publications in leading journals (Nature, Blood, Immunity, Arthritis & Rheumatology).
- The development of international collaborations.

- The establishment of a common facility for the deposition of reagents at the Department of Biochemistry, University of Lausanne.
- The Establishment of a new professorship in Arthritis Research at University of Geneva.
- Strengthened education in arthritis research through support to the Annual Joint Congress of the International Cytokine Society and the International Society for Interferon and Cytokine research.
- An Annual Conference held in Lausanne, where researchers from the member groups present their work and exchange ideas.
- Strategic expansion to drug discovery by screening existing compound libraries for small molecules able to inhibit or activate key pathways previously identified in the pathological process of arthritis.



Presentation at the Annual Conference

THE iAR RESEARCH CENTRES

University of Geneva

The two Rheumatology laboratories are affiliated to the Division of Rheumatology, Department of Internal Medicine Specialities and the Department of Pathology-Immunology at the University of Geneva School of Medicine.

In the group led by Professor Cem Gabay research is primarily focused on the pathogenesis of inflammatory responses in arthritis and other inflammatory diseases, with a special interest in the field of cytokines. Cytokines are small proteins that mediate communication between cells. Their critical role in immune and inflammatory responses is now well demonstrated by the successful development of therapies targeting cytokines in the management of rheumatoid arthritis and other rheumatic diseases. Among the different cytokines, our research is particularly focused on cytokines of the interleukin-1 family. In close interaction with the clinical Departments we have access to biological samples from patients. In addition, our laboratory uses different experimental models of inflammatory diseases. We are also leading and participating in clinical trials with anti-cytokine therapies in patients with rheumatic diseases.

In the group led by Professor Monique Gannagé, which was established by the iAR, the focus is on the effects of autophagy in arthritis diseases. Autophagy is a fundamental process for degrading and recycling cellular components. Recent advances in understanding the pathway have showed that autophagy is involved in many pathological processes, such as infection, cancer and neuro-degeneration. In particular, mutations in autophagy essential genes can cause diseases. Interestingly, disturbances in the autophagic machinery have been associated with immunological disorders. Our research focuses on the contribution of the pathway in regulating immune and inflammatory responses. Using both

clinical samples and experimental models of arthritis, we are analysing the implication of autophagy in the pathogenesis of rheumatoid arthritis and ankylosing spondylitis.

University of Lausanne

The Department of Biochemistry (DB) is part of the Faculty of Biology and Medicine of the University of Lausanne (UNIL) and teaches medicine, biology and immunology. It belongs to the Center of Immunity and Infection Lausanne (CIIL) which regroups scientists of UNIL and University hospital working in immunology and infectious diseases.

The research aims to contribute to the understanding of immune processes and elimination of immunological disorders by studying inflammation, cell differentiation and cell signalling, with a strong focus on the discovery and functional characterization of molecular pathways. This research has provided valuable insights into the stress-related activation of inflammatory processes in both Rheumatoid Arthritis (RA) and Osteoarthritis (OA). The research continues into deciphering how the molecular mechanisms of mechanical and oxidative stress affect inflammation. A second line of research, with the WHO Immunology Research and Training center (housed by the DB since 1963), studies parasitic diseases and the immune response they elicit.

University of Zürich

The Center of Experimental Rheumatology is at the Department of Rheumatology, University Hospital Zürich. The Center studies the molecular and cellular aspects of rheumatic diseases in a clinical setting. The European League Against Rheumatism (EULAR) has awarded it the status of a "Center of Excellence in Rheumatology" since

2005. This 5-year award, which has been granted 3 times successfully, is based on the record of scientific publication. The significant support by the iAR was pivotal for the published papers, as it was for six European funded projects



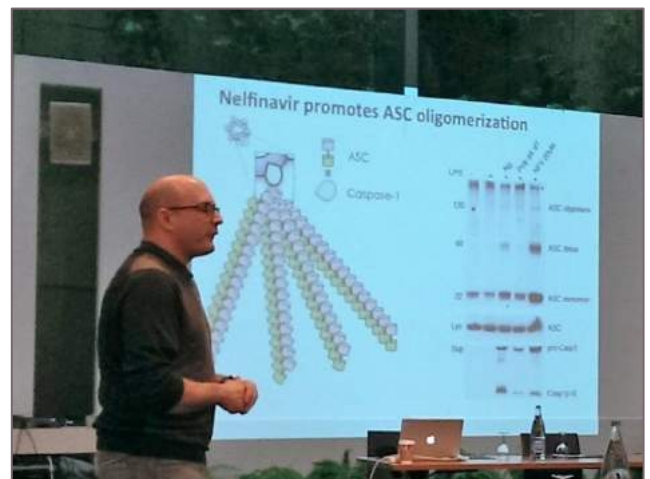
Research at the Institute of Rheumatology, Zürich

The research is focused on the epigenetics of rheumatic diseases. Epigenetic imprinting by environmental factors is at the core of experimental molecular research. Epigenetics is the study of heritable changes in genome functions that do not alter the nucleotide sequence within the DNA, in simpler terms, epigenetics stably regulates gene expression. Different biochemical processes act in a fine-tuned concert to regulate gene expression in both health and disease. The research related to rheumatic diseases has resulted in numerous new insights and novel diagnostic and therapeutic strategies are on the horizon which will be implemented in future research.

Institute for Research in Biomedicine, Bellinzona

The Institute for Research in Biomedicine (IRB) was founded in 2000 with the goal of advancing the study of human immunology, with particular emphasis on the mechanisms of host defence. The IRB works within a wide international network of collaborations and provides teaching and training programs for graduate students from Swiss and foreign Universities. Managing Director is Prof. Dr. Antonio Lanzavecchia, who is also ETH Zurich Professor for Human Immunology.

The crosstalk between immune cells and the bone is at the center of the emerging interdisciplinary field of Osteoimmunology. Researchers at the IRB, a recognized center of excellence for human immunology, aim to obtain insights into the molecular, cellular and systemic interactions between cells and molecules of the adaptive immune system and the skeletal system. Using new high throughput cellular screening platforms, they explore the immune response in rheumatic diseases, such as rheumatoid arthritis and ankylosis spondylitis, and how the response changes following therapy with biological agents.



Fabio Martinon presenting at the iAR Conference

ORGANISATIONAL STRUCTURE

Board of Directors

Prof. Cem Gabay: Chairman



Cem Gabay obtained his medical degree at the University of Geneva where he specialised in Medicine and Rheumatology. He also did clinical training at the Claude Bernard-Bichat University Hospital in Paris and worked from 1995-1999 as research fellow and Assistant Professor at the University of Colorado in Denver (USA). In 1999, he returned to Geneva to open his research laboratory with a bursary from the Swiss National Science Foundation and was appointed as Head of the Division of Rheumatology and Associate Professor in 2001, Full Professor of Medicine in 2008, and Chairman of the Department of Internal Medicine Specialities at the University of Geneva in 2013. He was President of the Swiss Society of Rheumatology from 2008 to 2012. He received several awards from the Swiss Society of Rheumatology, the European League Against Rheumatism, and the International Cytokine Society. Cem Gabay has published more than 250 articles. His research focuses on various aspects of cytokine biology and on clinical and translational aspects of Rheumatoid arthritis.

Prof. Nicolas Fasel, General Secretary



Nicolas Fasel is full professor at the Faculty of Biology and Medicine of the University of Lausanne. After studying biology at the University of Fribourg (Switzerland) and obtaining a doctoral degree at the Swiss Institute for Experimental Cancer Research working on mouse mammary tumor virus, he took up a post-doctoral position at the University of California Los Angeles working on immunoglobulin gene regulation. On his return

to Switzerland, he studied post-translational modifications of cell surface antigens. As an independent researcher of the Dr. Max Cloëtta Research Foundation, he had the opportunity to establish his own group investigating the molecular and cellular biology of protozoan parasites. From September 2006 to December 2016, he was director of the Department of Biochemistry. Since July 2015, Nicolas Fasel is Vice-Dean for Research and Innovation of the Faculty of Biology and Medicine of UNIL.

Prof. Steffen Gay, Vice Chairman



Professor Steffen Gay graduated from the Medical School at the University in Leipzig. Holding office from 1976-1996 at the Department of Medicine at the University of Alabama in Birmingham AL, he served there as Professor of Medicine from 1984-1996. Since 1996 he is Professor of Experimental Rheumatology at the University Hospital of Zurich and serves since 2016 as a consultant to the Department of Rheumatology in Zurich.

Steffen Gay has published largely related to the molecular and cellular basis of rheumatic diseases, including 64 book chapters and over 350 peer-reviewed scientific papers. He is among the most cited scientists in Clinical Medicine (ISI) with over 18,000 citations and a h-index of 72. He is an Honorary Member of the American Association of Physicians (AAP) and the Alpha Omega Alpha Honor Medical Society. He became the Spinoza Professor for 2002 at University of Amsterdam and a member of the Deutsche Akademie der Naturforscher Leopoldina in 2004. In 2008 he received the Kussmaul-Medal from the German Society of Rheumatology and in 2011 he became Honorary Member of EULAR and in 2015 MASTER of the American College of Rheumatology.

ORGANISATIONAL STRUCTURE

Scientific Advisory Board

Prof. Sir Marc Feldman FRS



Marc Feldmann is Professor of Cellular Immunology Kennedy Institute of Rheumatology at Oxford University, UK.

His work is focused on how autoimmune diseases are triggered, and particularly the role of cytokines and how they drive processes such as inflammation, immunity and cell growth. Together with Ravinder N. Maini their research led to the identification of TNF (tumour necrosis factor) as a therapeutic target for rheumatoid arthritis. From 1984 they examined the pathogenesis of rheumatoid arthritis, specifically the role played by the various signalling molecules, the cytokines, in regulating the disease processes. This work led them to realise that the disease could be treated by blocking the action of TNF with anti-TNF antibodies, called cA-2.

Extensive clinical trials showed that blocking the activity of TNF not only had a very beneficial effect on joint inflammation in a large majority of patients, but could also delay joint destruction. Millions of sufferers from various rheumatic disorders worldwide now receive treatment with TNF inhibitors, the drugs developed as a result of this path-breaking research.

Professor Lars Klareskog



Lars Klareskog is Professor for Rheumatology and Director of the Research Center for Molecular Medicine at the Karolinska Institutet at Karolinska university hospital in Stockholm, Sweden.

The Center's research is focused on translational research in inflammatory rheumatic diseases,

mainly arthritis, SLE, Sjögrens syndrome and myositis with some activities in scleroderma and vasculitis. It also carries out basic research related to inflammatory diseases within immunology, genetics and epidemiology. An example breakthrough is that his team discovered and could explain why people with a genetic disposition (HLA risk gene) and testing ACPA-positive have a significantly higher risk of developing Rheumatoid Arthritis, if they also smoke.

His work is characterised by great breadth and diversity. He is an accomplished mathematician, biochemist, immunologist, geneticist and epidemiologist. A belief in the importance of fostering collaboration and exchange also characterises his work. He has been a guest professor at the Harvard Medical School, the Imperial College London (Kennedy Institute of Rheumatology), the Hospital of Special Surgery der Cornell University, as well as in Seattle, Leeds und Denver (University of Colorado). From 1995 until 2012 he was a member of the Nobel Committee.

Communication & Fundraising

Dr. Judith Safford



Judith Safford received her training in Economics and Business studies at the University of Freiburg im Breisgau, Germany. In addition, she has a Diploma in Non-profit Management from the Fribourg University, Switzerland. She has worked for over 20 years in diverse non-profit organisations. Affected by Ankylosing Spondylitis since her early twenties, she is highly motivated to support efforts to increase research in Arthritis diseases and find new treatments to relieve the widespread suffering that Arthritis still causes.

FINANCIAL INFORMATION

1st October 2015 – 30th September 2016

	2015/16	2014/5
Cash at banks	1'421'061	1'357'016
Reserved for projects	365'000	1'000'000
Donations	470'000	375'000
Administration & Fundraising	40'955	35'879

Details are available on request. Please contact info@iar-suisse.ch

DONATIONS

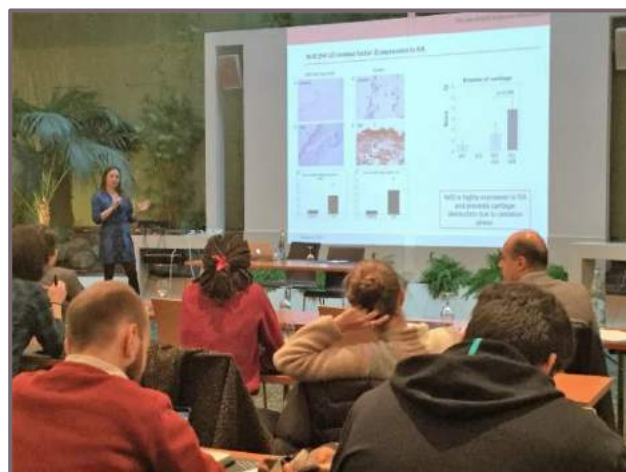
The Institute for Arthritis Research is a tax-exempted charity organisation in accordance with Art. 33 §1 Bst. i of Federal Law on direct federal tax / DBG; SR 642.11.

The research projects in 2015/16 were mainly supported by the Uniscentia-Foundation, Georg und Bertha Schwyzer-Winiker-Foundation, Ernst Göhner-Foundation and the Mäxi-Foundation.

Without these generous donations, the essential research work carried out by the member researcher institutes of the iAR would not be possible. We thank all these organisations and all others who have contributed to the work of iAR.

Our accounts details for donations:

Banque Raiffeisen
 Voie du Chariot 7
 1003 Lausanne-Haute-Broye-Jorat
 Account name: Institute for Arthritis Research
 IBAN: CH16 8045 1000 0066 9359 4



Jennifer Palomo presenting at the Annual iAR Symposium:
 The role of new IL-1 cytokines in skin inflammation

