

Immunology in Austria – Past and Present

History

At the time of the first surge of immunological research during the second half of the 19th and the beginning of the 20th century, Austrian physicians made important contributions to this emerging new science. Rudolf Kraus was the first to describe the precipitation reaction occurring after mixing soluble antigen with a specific antiserum. Max von Gruber contributed to the application of bacterial agglutination as a diagnostic tool (Gruber-Widal test). Karl Landsteiner, studying hemagglutination using sera from individual persons, discovered the ABO blood group system, made important observations in the serodiagnosis of syphilis and in 1904 described the first autoantibody and thus the first autoimmune disease, paroxysmal cold hemoglobinuria. Ernst Peter Pick modified proteins by attaching simple chemicals and showed that after their injection in animals they produced antibodies specific for the chemical (later termed hapten by Landsteiner). Löwenstein and Eisler-Terramare made the important observation that bacterial toxins could be inactivated by formaldehyde without losing their antigenicity. These were called toxoids and used for the immunization of animals as well as humans. Another outstanding immunologist of this period was Clemens von Pirquet, a pediatrician, well-known for coining the term “allergy” in 1906. He also made important studies on serum sickness, developed a skin test for tuberculosis – the tuberculin reaction – and, together with Schick, a skin test for diphtheria.

Two world wars significantly impaired Austria's capacity in immunological research. Landsteiner left Austria in 1919, Ernst Peter Pick was exiled in 1938 after the “Anschluss”, and Eisler-Terramare was detained in a concentra-

tion camp. In 1945 research in Austria was practically non-existent. It took almost 20 years until immunology again took root in Austria. It was Carl Steffen, who chaired a diagnostic laboratory at a Viennese hospital, who started a self-taught career in immunohematology. On this basis, he developed a serological test for autoantibodies – the antiglobulin-consumption test (later called the “Steffen test”). In 1967 he was appointed chairman of the newly established Institute of Immunology at the University of Vienna Medical School (the first of its kind in German-speaking countries).



Figure 1 Clemens von Pirquet Medal

Throughout the years preceding and following the establishment of the Institute of Immunology, young Austrians were given the opportunity to obtain solid immunological training in various first rank institutions in the USA, the UK, Holland, France, Israel and other countries. In due course, a new school of immunology arose in Austria, which led to the foundation of the Austrian Society for Allergology and Immunology in 1971.



Figure 2 Karl Landsteiner Medal

The Austrian Society for Allergology and Immunology

From its onset, the Austrian Society for Allergology and Immunology (Österreichische Gesellschaft für Allergologie und Immunologie, ÖGAI, www.oegai.org) was conceived as a platform upon which basic and clinical scientists could communicate for their mutual benefit. New aspects for a basic understanding of the pathophysiology of allergy were opened by the discovery of IgE, a significant advance in a field which up to the Sixties was restricted to skin-prick testing. Therefore, Steffen invited a proponent allergist, Alois Ferstel, to be involved in the foundation of this new Society. The founding General Assembly took place on the 8th of May, 1971. After a somewhat slow beginning, more and more scientists, including those trained abroad and full of enthusiasm, joined the Society. Over the years, internationally recognized research groups were established, and the Annual General Meetings grew both in the number of attendees and the quality of the papers presented. With currently just over 600 members, membership is one of the highest of all national immunological



Figure 3 Expelled Austrians in Immunology. From left to right: front row: Bernhard Cinader, Ruth Nussenzweig, Fritz H. Bach, and Arnold Reif; back row: Israel Pecht, Emile Zuckerkandl, Ira M. Green, Felix Milgrom and Peter H. Schur.

societies in Europe in proportion to the respective national population (the population of Austria currently stands at 8 million).

The focus of research by key players of the society includes the immunology of collagen (Carl Steffen), autoimmunity (Georg Wick), typing of leukocytes and their characterization in the CD-system (Walter Knapp), cells of the immune system in the skin (Georg Stingl), Langerhans cells and dermal dendritic cells (Gerold Schuler and Nikolaus Romani), molecular characterization of allergens and pathophysiological mechanisms of allergy (Dietrich Kraft and his group), immunodeficiencies (Martha Eibl), rheumatoid arthritis (Josef Smolen), T cell signaling (Hannes Stockinger), complement (Manfred Dierich), immunosenescence (Georg Wick and Beatrix Grubeck-Loebenstein), just to name a few of the currently active contributors.

The Austrian Science Research Fund – the major Austrian granting institution – recognized and supported these activities by establishing several special

research programs (Spezialforschungsbereiche, SFB) and funding numerous single projects for these activities. Two of these SFB are still ongoing: SFB F18 - Molecular and Immunological Strategies for Prevention, Diagnosis and Treatment of Type I Allergies (Coordinator Rudolf Valenta, Vienna); and SFB F23 - Mechanisms of Establishment and Maintenance of Immunological Tolerance (Coordinator: Wilfried Ellmeier, Vienna). The Christian Doppler Society, another funding institution, supports three laboratories devoted to allergy research: the CD-Laboratory for Allergy Research, headed by Rudolf Valenta, Vienna, the CD-Laboratory for Allergy Diagnosis and Therapy, headed by Fatima Ferreira, Salzburg, and the CD-Laboratory for Immunomodulation, headed by Barbara Bohle, Vienna.

ÖGAI and the International Scientific Community

From the beginning, the ÖGAI established links with other immunological societies, particularly with its neighbor-

ing countries. Joint meetings were held with the immunological societies of Germany, Hungary and Italy, and scientists from Eastern European Countries were regularly invited to the Annual Meetings of the ÖGAI. In particular during the presidency of Othmar Förster, efforts were made to open the Society to the international immunological stage. Because of these activities and his accomplishments in macrophage research, Othmar Förster was elected unanimously in 1990 as the Honorary President.

Ever since the Tatra Conferences were started in Slovakia in 1994 as a joint project between the British Society for Immunology, the Czech and Slovak Societies for Immunology, and the ÖGAI, members of our society have been involved in the organization and support of this meeting (Georg Wick as founding member, and presently Hannes Stockinger as one of the organizing committee members for the 2008 meeting; www.img.cas.cz/tatra). This year, the ÖGAI will again host a Joint Annual Meeting with the German Society for Immunology, in Vienna from September 3–6, 2008.

The ÖGAI is a member of international immunological Federations such as IUIS and EFIS and several Austrians have held various offices in these societies. Carl Steffen served as a Council member of the IUIS from 1980 to 1983; Walter Knapp, Josef Smolen and Rudolf Valenta were/are chairmen of the IUIS Committee on Quality Assessment and Standardization from 1992–1995, 1995–1998, and 1998–2008, respectively. From 1998 until 2004, Josef Smolen served as treasurer of the IUIS. Between 1978 and 1980, Carl Steffen was President of EFIS. Another Austrian in this post from 1998 to 2000 was Walter Knapp, who also served as Vice President from 1995 to 1998. In 2006 Hannes Stockinger was elected to serve as treasurer of EFIS until 2009.

ÖGAI members were/are also in prominent positions in various international Allergy Groups. Dietrich Kraft was a member of the IUIS/WHO Subcommittee on Standardization of Allergens from 1992 until 1996. During this time he was also a member of the Board of the Collegium Internationale Allergologicum (CIA), and from 1992 until 2001

he served as a member of the Executive Board of the European Association of Allergy and Clinical Immunology (EAA-CI). In 2005, the World Allergy Organization (WAO) elected Rudolf Valenta as a member of the Research Council, and since 2006 he has also been a member of the Council of the CIA. From 2003–2005 he was a Member at Large and from 2005–2007 Second Vice-President of the EAACI. Furthermore, Barbara Bohle has served as Secretary of the Immunology Section of the EAACI since 2005, and is a Scientific Advisory Board member of the Paul Ehrlich Institute since 2006.

In order to develop an immunology curriculum that might serve as a useful model for harmonizing training programs in immunology throughout Europe, members of the ÖGAI have been delegated to the sections of Allergy (Heinz Kofler, Fritz Horak) and Medical

Biopathology (Commission of Immunology, Gerhard Zlabinger) of the UEMS (Union of European Medical Societies). Particular efforts within Medical Biopathology have led to the definition of a European curriculum, which is now being followed up by the development of criteria for training centres, and the establishment of a detailed logbook for training immunologists.

The 4th International Workshop and Conference on Human Leukocyte Differentiation Antigens, organized by Walter Knapp in Vienna in 1989, was a major event in which Austrian immunology was connected to the international scientific community. In addition, the ÖGAI had the honor of hosting the EAACI Conference on two occasions: in 1977 with Carl Steffen as President, and in 2006 under the chairmanship of Rudolf Valenta. In the near future, we

hope to have the privilege of organizing one of the EFIS Congresses.

To strengthen the ties to the international scientific community, the ÖGAI has invited selected renowned immunologists to accept honorary membership. To date, there are six honorary members in our society: Ira M. Green, Bethesda, MD, USA (honorary membership awarded in 1981), Gustav J. V. Nossal, Melbourne, Australia, a native Austrian who was exiled in 1938 (1987), Noel R. Rose, Baltimore, MD, USA (1994), Fred Rosen, Boston, MA, USA (1996), Ethan Shevach, Bethesda, MD, USA (2000) and Fritz Melchers, Basel, (2002).

In addition, the ÖGAI has implemented a “Clemens von Pirquet Medal” (Fig. 1) which is awarded to outstanding allergists. To date, this honour has been bestowed on the following scientists: Robin R. R. Coombs, Cambridge, UK (awarded in 1988), Alain de Weck, Berne, Switzerland (1990), Alec Sehon, Winnipeg, Canada (1994), Allen P. Kaplan, Charleston, SC, USA (2001), Gunnar Johansson, Stockholm, Sweden (2002), Sergio Romagnani, Florence, Italy (2002), Dietrich Kraft, Vienna, Austria (2003) and Radvan Urbanek, Freiburg, Germany (2006). Another honorary medal awarded by the ÖGAI for outstanding achievements in immunology, the Karl Landsteiner Medal (Fig. 2), has to date been awarded only once in 2004, to Georg Wick, Innsbruck, Austria. He is an internationally recognized investigator of autoimmunity and a pioneer in studies of immune mechanisms in the pathogenesis of arteriosclerosis.

A special event was organized in 1988, the year of the 50th anniversary of the occupation of Austria by the Nazi regime, and the subsequent expulsion of Jews and political opponents from the country. Many of these refugees found new homes in other countries, mostly in the USA, UK, Israel or Australia. Some became prominent scientists, particularly in immunology. The ÖGAI invited these expelled Austrian immunologists to a meeting in Vienna, entitled “Österreicher in der Immunologie: Der Verlust durch 1938 — 50 Jahre danach” (“Austrians in Immunology: The loss in 1938 — 50 years later”), where they presented their research to young Aus-

EAACI 2006
XXV Congress of the European Academy of Allergology and Clinical Immunology
10–14 June 2006, Vienna, Austria

A truly international Congress:
6227 participants and
294 accompanying persons from
104 countries!

Figure 4 Poster highlighting the success of EAACI 2006 held in Vienna, Austria.

trian immunologists. Most were able to accept the invitation (Fig. 3). The purpose of this meeting was to remind us of the loss inflicted upon our country by a prejudiced and inhumane ideology.

Meetings

During the first years following its founding, meetings organized by the ÖGAI were more or less incidental and focused on allergy and clinical immunology. After 1986, stronger links to basic immunology were forged by holding the Annual Meeting jointly with the Austrian Biochemical Society. Additional meetings were held each year on clinical immunology – sometimes together with one of the societies for clinical (sub)-specialties (rheumatology, haematology and oncology) – and allergy.

In the Nineties, specialty-focused international meetings became more numerous and therefore, the number of national meetings organised by the ÖGAI was reduced and, after 1998, the primary focus was on the Annual Meeting, which took place in different locations within Austria. These Annual Meetings grew steadily both in terms of the number of attendees and the quality of the contributions from Society members and guests, and first class international speakers were solicited for presentations at the meeting symposia. In 2004, one of the Annual Meeting's symposia was devoted to the 100th anniversary of the first description of an autoimmune disease caused by an autoantibody, the so-called Donath-Landsteiner antibody, which as mentioned above causes paroxysmal cold hemoglobinuria. At this 2004 meeting, eight distinguished speakers reported their research in four symposia, and 146 papers were presented as short oral communications or posters.

One of the most recent highlights among the conferences organized in Vienna was the XXV EAACI Congress, mentioned above, organized by Rudolf Valenta. There were over 6 000 participants, 150 sessions with 300 speakers, and 1713 free communications including posters (Fig. 4).

In addition, many smaller meetings have been organized by enthusiastic members of the Society, with endorse-

ment by the ÖGAI. They include the “Wörthersee Symposia” on new developments in clinical allergy, organized by Reinhart Jarisch, and the meetings on the new discipline of “Allergo-Oncology” organized for the first time in 2007 and repeated in 2008 by Erika Jensen-Jarolim.

Promotion of young scientists, public education, professional politics

To acknowledge the outstanding work of young scientists, the ÖGAI in association with generous sponsors annually awards prizes for excellent publications in both immunology – the “Karl Landsteiner Prize” – and allergy – the “Clemens von Pirquet Prize”. The first prize is sponsored by the “Karl Landsteiner & Eisler-Terramare Foundation”, the second by ALK-Abellò Company. The awardees are chosen after a peer-review process involving international scientists. Furthermore, up to three prizes are given every year to the best theses in immunology or allergy. The first thesis prize has been sponsored, and is awarded in their name, by Ursula and Fritz Melchers since 2003. At the Annual Meetings of the Society, the three best poster presentations are also honoured by a Poster Prize. Moreover, numerous travel scholarships are awarded each year to allow young Austrian immunologists to attend international meetings.

Many efforts are made by the ÖGAI to bring knowledge about immunology and allergy to the public. The “Day of Immunology” and the “Day of Allergy”, which have taken place annually for a few years now, are taken as opportunities to present the Society, its activities and achievements to the public *via* the press and other public media outlets. Four years ago an educational exhibition about vaccination was compiled by the ÖGAI. This was presented at schools and to the general public, in order to overcome widespread irrational prejudice against vaccination programs, and to promote understanding of these important prophylactic measures.

To ensure competence and training for the provision of diagnostic immunology, efforts were made for many years to establish immunology (as opposed to subspecialties such as rheuma-

tology) as a medical specialty for specially trained physicians. In 1993 the “Facharzt für Immunologie” (Specialist for Immunology) was officially recognized by the Austrian authorities and, since then, 32 doctors have attained this licence. The educational and training program for this new specialty was worked out by the ÖGAI, and the examinations required in order to be awarded the licence are prepared by members of the Society annually. Furthermore, ÖGAI members are participating in the endeavours of the UEMS to establish and harmonise training programs in immunology and allergy throughout the EU countries. Unfortunately, the ÖGAI has not yet been successful in its efforts in establishing allergy as a recognised medical specialty in Austria. Hopefully, the imminent recognition of this specialty by the UEMS will assist us in attaining this goal.

In order to promote the public recognition of various specialized disciplines in immunology and allergy, to harmonize their procedures and to provide self regulatory mechanisms, the society has established several committees: Clinical Immunology (Chair: Hermann Wolf), Clinical Allergy (Chair: Reinhart Jarisch), Vaccines (Chair: Ursula Wiedermann-Schmidt) and Pre- and Postdoctoral Training in Immunology, (Chair: Hannes Stockinger). All of these activities will help the Society maintain its standing and influence upon immunological research and its clinical application in the 21st Century.

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