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OVERVIEW

Progress and history of the 10th Federation of African Immunological Societies Congress

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Abstract

The 10th Federation of African Immunological Societies (FAIS) Congress, held in Tunisia in November 2017, marked a significant scientific milestone. It enabled scientists from across the continent to promote immunology research and to showcase major achievements made by immunologists throughout Africa. This issue of the *Journal of Leukocyte Biology (JLB)* features manuscripts from the FAIS Congress. As noted in these papers, research in infectious diseases remains the focus of the African immunology community; however, increasingly noncommunicable diseases—such as autoimmunity, allergy, primary immunodeficiency, cancer and transplantation immunology—are also an emerging priority. This overview gives a brief history of the FAIS meeting, which also commemorated the 25th anniversary of the FAIS. It describes the current activities of the organization, as well as its history and the future opportunities for this Federation.

KEYWORDS

africa, immunology, research

1 | RESEARCH PRESENTED DURING THE 10TH FEDERATION OF AFRICAN IMMUNOLOGY SOCIETIES CONGRESS

The Congress, held on December 3–7, 2017, in Hammamet, Tunisia, was organized by Federation of African Immunology Societies (FAIS) with the support of the International Union of Immunological Societies (IUIS) and was hosted by the Tunisian Society of Immunology under the leadership of Hatem Masmoudi and Ridha Barbouche. This was the largest and most successful of all the FAIS meetings to date. Indeed, the Congress was attended by 270 immunologists from 20 African countries and representatives of 5 continents. Moreover, travel grants were made available to a total of 99 students, enabling young investigators from all regions of the continent to attend. The scientific program included sessions on both fundamental and translational immunology and focused on infection and immunity, vaccinology as well as autoimmunity, allergy, primary immunodeficiency, transplantation, and cancer immunology.

The Congress-related manuscripts presented here speak to the quality of research being conducted by African immunologists. This research focuses primarily on infectious diseases, including well-known public health threats, such as HIV/AIDS, Malaria and Tuberculosis, as well as often-neglected infectious diseases, such as Leishmaniasis, Bureli Ulcer, and Helminth infections.

This issue of JLB features a number of manuscripts describing these infectious diseases, including data on the impact of maternal HIV-exposure, feeding status, and the microbiome on infant cellular immunity, as reported by Clive Gray and colleages.[1] The pathogenesis of tuberculous meningitis is described by Robert Wilkinson[2] and Benabdessalem[3] and their colleagues and shows how granzyme B induced by Rv0140 antigen in latently infected individuals with tuberculosis is different from those with active tuberculosis. The challenges associated with treating Buruli Ulcer are investigated by Sammy Aboagye and colleages[4] and, in an experimental model, Frank Brombacher and his colleagues[5] highlight the contribution of IL-4Rα-expressing CD11c$^+$ cells in

Abbreviations: AESA, Accelerating Excellence in Science in Africa; EFIS, European Federation of Immunological Societies; FAIS, Federation of African Immunological Societies; IDeAL, Initiative to Develop African Research Leaders; IUIS, International Union of Immunological Societies; TIBA, Tackling Diseases for the Benefit of Africa.

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driving optimal cellular responses during *Schistosoma mansoni* infection in mice.

Although infectious diseases remain a serious public health concern and significant area of study, interest in the study of non-communicable immune-related diseases is increasing. In line with this evolution, the JLB cluster of papers also places a particular focus on autoimmunity. For example, Hatem Masmoudi and colleagues[6] review the immunogenetics of Tunisian endemic pemphigus foliaceus and the review by Melika Ben Ahmed and colleagues[7] describes the role of an endogenous aryl hydrocarbon receptor ligand in enhancing de novo generation of regulatory T cells in humans. The field of cancer immunity is also represented by Amel Benammar Elgaaied[8] in his article on the expression and polymorphism of micro-RNA according to body mass index and breast cancer presentation in Tunisian patients. Furthermore, Abdallah Badou[9] reviews the role of T lymphocyte subsets in cancer immunity, and Yousr Gorgi and colleagues[10] highlight the importance of the IL-23/IL-17 pathway in kidney allograft rejection.

These articles represent a solid body of research, which is especially remarkable given the challenges African immunologists face while working in this region. Despite suboptimal working conditions, a lack of funding, and inadequate infrastructure, as well as the difficulties of the public health sector in many countries, African immunologists and, particularly students and young investigators, are making progress in the field. This progress will definitely impact the health of Africans for years to come.

2 | FAIS HISTORICAL BACKGROUND

The 10th FAIS Congress in December 2017 coincided with the 25th anniversary of the founding of the society in 1992. The establishment of FAIS was driven by the urgent need to develop African expertise to address the emergence of HIV and the AIDS epidemic, which exposed several shortcomings in the biomedical infrastructure in Africa, including those in institutional organization, personnel, and funding. Scientists from outside Africa, including Peter Piot and colleagues,[11,12] Serwadda and colleagues,[13] and van der Pierre and colleagues,[14] made the initial reports of AIDS in the African continent. By 1990, life expectancy was falling and fertility was decreasing in all sub-Saharan countries. National governments seemed paralyzed, and interested international research experts, laboratories, and institutions could not identify local partners with whom to collaborate.

It was within the unique historical context of the AIDS pandemic that FAIS was formed at a meeting of founder Member Societies in Harare, Zimbabwe. Starting from the initial 3 members, FAIS now includes 15 societies of immunology from member states of the African Union and 1 of the 5 Member Federations of the IUIS. With the slogan "Immunology without Borders," FAIS pursues its mission in promoting scientific research and the clinical practice of immunology for the benefit of human and animal health. Currently, member societies represent different geographic and linguistic regions of the continent and, thus, the initial focus and priorities have been continuously reviewed, refined, and refocused.

At the inaugural meeting, most attendees were microbiologists, infectious disease researchers, and physicians; expertise in immunology or virology was very limited. In a subsequent continental survey reported by Sibanda at the third FAIS Congress in Cape Town, South Africa, fewer than 7 Africans describing themselves as clinical immunologists were in Southern Africa or in the Maghreb, where inherited immunodeficiencies and not HIV drove immunology research.

Facing this striking contrast between the need for immunology research and the paucity of the required expertise, FAIS proposed strategic plans to promote and develop human capital, supportive infrastructure, and locally relevant research, becoming a Pan African coalition of national immunology societies affiliated with the IUIS. FAIS's objectives include conducting research germane to African priorities, such as HIV/AIDS and tropical diseases, and providing scientific leadership and expert technical advice to governments and policy makers. FAIS is committed to lobbying for and promoting the training of immunologists in all member societies.

To realize its objectives, FAIS adopted a strategy to establish local immunology hubs in all regions of Africa and, thus, to create a critical mass of immunologists in African universities and research institutions through the training, and leveraging and networking of African scientists in Africa, the African diaspora, and partner institutions elsewhere in the world. To those ends, FAIS cultivates strong partnerships with the IUIS and European Federation of Immunological Societies (EFIS) member societies to promote North–South collaboration in research and training.

3 | CONCLUSION

The African continent, which has the lowest income per capita juxtaposed with the highest burden of several overlapping diseases, including malaria, tuberculosis, HIV, and neglected tropical diseases, faces many challenges. The emergence and reemergence of often devastating diseases such as that due to Ebola virus exacerbates the vicious circle of poverty and disease. The availability of human resources is essential to meet the challenge, to develop robust surveillance and monitoring systems to predict and control diseases, and to advance vaccine development. The FAIS has provided a framework to nurture human resource development, robust institutions, and sustainable funding. There is a need to establish, grow, and strengthen national research capacity and to support sustainable funding for resident African scientists to monitor diseases and provide science-based data to better inform policy. During its brief 25-year history, the FAIS has made significant advances in strengthening of African research capacity. The quality of research and the numbers of young researches have increased. The African research landscape has been transformed and it is hoped that support from all partners will be increased and sustained.

Tracing the rise of FAIS

The FAIS was primarily developed as a way of increasing the pool of African immunologists. Its strategic plan focused on training, the

role of the African immunology diaspora, collaborating with IUIS, and obtaining funding. In 1992, the FAIS status was reviewed during the Sharm el Sheik FAIS Congress, guided by Ahmed el-Gohary and showed very minimal success, with limited numbers of member societies, a lack of enthusiasm from local leadership, and poor diaspora involvement. South–South collaboration within Africa also was very limited. Most importantly, there was no funding of FAIS as a whole.

There were bright spots however. The collaboration between IUIS and FAIS was successful. That partnership soon led to continued FAIS Congresses and, from 2000 the IUIS scheduled executive committee meetings alongside FAIS, further contributing to the scientific programs and promoting research collaboration with both institutions and individual scientists. The collaboration also included a series of African International Conference on Immunity meetings, which was initiated in collaboration with Rudolf Valenta of Austria.

A key challenge that FAIS needed to overcome was the development of an all-inclusive research agenda. The absence of such a strategy made it especially difficult to access thematic, intercountry block funding for priority areas such as malaria, tuberculosis, HIV, and neglected diseases. The Europe Developing Countries Training Program, which was established in 2003 after intense lobbying by EFIS members as a European contribution to address the crisis resulting from HIV and AIDS, tuberculosis, and malaria, has rarely been accessed transnationally by FAIS member societies.

The Sharm el Sheik strategic shift gave greater emphasis to strengthening the FAIS organization and to seeking new areas of funding. During the Nairobi FAIS Congress, led by President Tom Kariuki, the organization began to fulfill those mandates. FAIS secured funding from the Wellcome Trust, the Bill & Melinda Gates Foundation, and the UK Department for International Development. FAIS also teamed with the African Academy of Sciences to further coordinate Afrocentric research, agreeing that it was more cost-effective to provide research support within Africa when that research was led by Africans, for the benefit of African communities.

This shift in thinking also led to additional collaborations with other African-centered organizations. The Alliance for Accelerating Excellence in Science in Africa (AESA), a funding platform and research agenda setting initiative, was begun in 2014. AESA already has supported the funding of some 11 countries through the Developing Excellence in Leadership, Training, and Science in Africa initiatives, including the Kenyan-based Initiative to Develop African Research Leaders (IDeAL). Another Afrocentric platform, Human Heredity and Health in Africa (H3Africa), was designed to support a Pan-African network of laboratories to research the interplay between environmental and the genetic factors underlying disease susceptibility in African populations. A multicountry research project, Tackling Diseases for the Benefit of Africa (TIBA), funded by the United Kingdom Government's National Institute for Health Research Global Health Research Unit, is supporting researchers from 9 African countries (Botswana, Rwanda, Ghana, Kenya, South Africa, Sudan, Uganda, Tanzania, and Zimbabwe). These institutions are in partnership with the University of Edinburgh, Scotland. Research topics are chosen by African scientists on the basis of local relevance. Eighty-five percent of TIBA research funds are earmarked for use in Africa, another significant departure from erstwhile funding trends. Although TIBA is not a FAIS initiative, the objectives dovetail with the FAIS mission emphasizing research, human resource development, collaboration, and the fostering of partnerships as equals.

Immunologists affiliated with FAIS have played leading roles in all of these collaborations. Past FAIS Presidents Rose Leke is on the H3Africa advisory board, Tom Kariuki is Director of AESA, Ahmed el-Gohary is President of the Egypt–Japan University of Science and Technology (E-JUST), Willem Hanekom is the Deputy Director at the Gates Foundation Tuberculosis Vaccine research, and Faith Osier was a leader of IDeAL and President Elect of IUIS.

Training the next generation of scientists remains an important goal. FAIS, in partnership with IUIS, recently launched the FAIS Legacy Project to support the training of 1000 Ph.D. graduates. The Project enables African students to spend 3–6 months in collaborating universities within the network of IUIS member institutions. The anticipated outcomes are increased numbers of immunology researchers across Africa, modernized and improved quality of research, and a fostering of long-term collaboration.

And finally, vital to the growth of FAIS and to research in immunology are professional meetings. The next meeting will be held in 2020 in Malawi under the leadership of FAIS President Henry Mwandumba. The IUIS will host the first-ever Congress in Africa in Cape Town, South Africa in 2022 and will be led for the first time by an African, and organized by Clive Gray and the IUIS President-Elect Faith Osier.

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