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Feature Article

An Overview of the History of Biochemical Research in Argentina

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Biochemistry and especially biochemical research started, in general, in Argentina, together with physiology. In 1919 the 'Instituto de Fisiología' at the School of Medicine of Buenos Aires University was created, and Dr Bernardo Houssay, our future first Nobel Prize winner, was appointed Director. Biological Chemistry was taught there by the great professors of the time, Drs Alfredo Sordelli, Venancio Deulofeu, Ciro T. Rietti and Agustín Marenzi. Research in biochemistry followed later on and was really started by Luis F. Leloir, and afterwards, Raúl E. Trucco and others collaborated. However, the political situation in the country was unfavourable for its development since the slogan 'alpargatas sí, libros no' (shoes, not books) began to be shouted in the streets. Notwithstanding, the young scientists devoted to biochemical research stubbornly went on, and in 1947 the 'Fundación Campomar' was created by private contribution from C. Campomar, obtained through Carlos E. Cardini, and the then humble 'Instituto de Investigaciones Bioquímicas' (Institute for Biochemical Research) was founded by Dr Leloir. Alejandro Paladini was the first scholar, followed progressively by E. Cabib, H. Pontis, M. Olavarría, A. Parodi, I. Algranatti, H. Carminatti, M. Dankert, and many others. The main subject studied there was, at that time, the biosynthesis of saccharides.

In 1955 the political situation of the country changed abruptly and a revival of culture and science appeared. So, new centers, very active in biochemical research began to appear not only in Buenos Aires Medical School with the nomination of Andrés O. M. Stoppani as full-time professor of Biological Chemistry, who gathered many young scholars like H. Cannata, J. J. Cazzullo, A. Boveris, C. Milstein and others, but also in other towns. Later on it would be converted into the CIBIERG. In La Plata, biochemical research in the lipid field, mainly fatty acid biosynthesis, made its appearance in 1956, at the School of Medical Sciences of La Plata University, with the designation of the chemist Rodolfo R. Brenner as Professor of Biological Chemistry. Readily,

young collaborators like N. Bottino, R. O. Peluffo, O. Mercuri, M. E. De Tomás, followed by M. J. Tacconi, N. Tacconi, A. M. Nervi, A. Catalá, R. Pollero, C. Marra, H. Garda, O. J. Rimoldi and others joined him. It would become the INIBIOLP in 1982.

This had a catalytic effect on the School of Chemistry of La Plata University that led to the designation of Gabriel Favelukes as professor of Biochemistry. He started research on plant symbiont biochemistry, and other lines followed, investigated by the V. Romanovski and M. Añón (CIDCA) groups.

In 1958, the scientific research received extraordinary support by the creation of the National Research Council (CONICET), with B. Houssay as the first president. It organized research, institutes were created, and scholarships, salaries and economic help were greatly increased, leading to a rapid expansion of biochemical research. Many new institutes of biochemistry have been founded since then.

In 1959, A. Paladini was nominated professor of Biological Chemistry at the School of Pharmacy and Biochemistry of the University of Buenos Aires. He organized a research group, later on known as IQUIFIB, working mainly, at the beginning, on growth hormone, with the collaboration of A. Santomé and J. Dellacha. A group formed by E. F. Soto and J. Pasquini worked on neurochemistry.

In 1963, R. Caputto, who had worked with Dr Leloir, returned from the USA, and developed biochemical research at the Department of Biological Chemistry at the University of Córdoba, and many young collaborators such as H. Barra, F. A. Cumar, H. Maccioni, A. Arce, J. Curtino and A. Blanco, joined his efforts, and later on his daughter Beatriz, together with B. Maggio. One of the subjects studied was the gangliosides. This group would be converted later on into the CIQUIBIC.

However, the biochemical researchers did not have their own society where they could meet and discuss their problems. This led Drs Leloir, Stoppani, Brenner and Cumar, representing four different groups of biochemical research, to meet on 15 March 1965, resolving to propose to their colleagues the constitution of the Argentine Society for Biochemical Research (SAIB). This was enthusiastically approved and

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from then until the present, 42 scientific Congresses have been held, some of them together with other South American societies, mainly from Chile and Brazil, under the umbrella of PABMB.

In 1970 the Institute of Biochemistry (INIBIBB) was created by N. G. Bazán in Bahía Blanca and many now senior researchers, such as N. M. Giusto, A. M. Pechen d'Angelo, T. S. Alonso, M. Aveldaño, M. F. Pediconi, N. P. Rotstein, etc., began their careers and carried out lipid research on the biochemistry of retina and other aspects. F. Barrantes is the present Director of INIBIBB and organized excellent research on neuroreceptors. R. L. Boland and his wife A. Russo also organized their own research carrying out interesting work on vitamin D, etc.

In Tucumán, biochemical research was also similarly developed at that time at the University, and R. N. Fariás formed a group with B. Bloj, R. D. Morero and others to study the effects of lipids on membrane properties.

In Rosario (Santa Fé province), active biochemical research was started in 1970 by the creation of the CEFODI guided by R. Vallejos and J. J. Cazzulo, and the continuous collaboration of C. S. Andreo, working mainly on photosynthesis. At present, important research is also done at Rosario by groups guided by N. Carrillo and D. de Mendoza (IBR) in plant and bacterial biochemistry, respectively.

As part of this continuous development, it is important to point out that in 1970 Luis F. Leloir received the Nobel Prize for his work on UDPG and saccharide synthesis. This event was also beneficial to sustain and push ahead biochemistry in our country.

The adoption of techniques in molecular biology expanded research in our country and SAIB was renamed 'Sociedad Argentina de Investigación Bioquímica y Biología Molecular' (Argentine Society for Research in Biochemistry and Molecular Biology) in 1994.

So, we now have many institutes using these techniques in Buenos Aires. The INGEBI, founded in 1983, under the direction of H. Torres and such collaborators as his wife M. Flawiá, with G. Glikien, M. Levin, M. Rubinstein and others, was one of the first to develop many aspects of gene biochemistry. In the Faculty of Ciencias Exactas y Naturales, A. Kornbliht also makes intensive research along this line. Other important groups exist at the School of Medicine, formed by E. Podestá, H. Cannata, etc.; at the School of Pharmacy and Biochemistry, formed by N. Sterin Speziale, M. Fernández Tomé, A. Boveris, R. L. Wikinski and others. At the Institute of Experimental Biology (IBIME), E. Charreau carries out important research, and is the current president of the CONICET, with R. N. Fariás from Tucumán University as scientific Vice-President.

In other towns, like San Martín and Chascomús, the IIB-INTECH, guided by A. C. Frasch, R. A. Ugalde and with the

collaboration of J. J. Cazzulo and others, carries out applied biochemical research on plants and microorganisms such as *Trypanosoma cruzi* and Chagas disease. In Mar del Plata, at the Foundation for Biological Applied Investigations, H. Pontis, and at the Institute of Biological Research, R. D. Conde, L. Lamattina, G. Daleo and others, conduct studies on plant biochemistry. In Santa Fé, at the Department of Biological Sciences, University of Litoral, Y. B. Lombardo, A. Chicco and others pursue research on the biochemistry of type 2 diabetes. In San Luis, at the National University of San Luis, M. S. Giménez also leads a group devoted to the study of lipid biochemistry. At the University of Rio Cuarto, province of Córdoba, C. D. Domenech, T. Machado and others have done important work on lipid biochemistry and *Trypanosoma cruzi*. Other important groups exist in cities like Quilmes (M. R. Ermácora).

However, in spite of the steady development of biochemical research in Argentina, it has not been continuously supported. The period 1976–1982 was bad, due to political turmoil and bloody persecutions. The period of the Menem presidency (1990–2000) and that of De la Rúa (2000–2002) were also unfavourable due to many anti-scientific decisions taken by the government following the advice of the Minister of Economy D. Cavallo. He had a very anti-scientific position, clearly demonstrated in his public words 'científicos a lavar los platos' (scientists go to wash the dishes). Fortunately, the intention to inactivate CONICET was prevented.

But biochemical research was so firmly established that it continued to progress. In addition to SAIB, the Argentine Neurochemical Society was created. Moreover, in 2000, the lipidologists began to organize a very successful biannual biochemical meeting named 'Workshop on Biochemistry and Molecular Biology of Lipids and Lipoproteins'.

A good picture of the vast development of Argentine biochemical research can be obtained from the 41st Congress of SAIB held together with PABMB in 2005. More than 900 researchers, scholars and others attended the Congress, of whom 763 were Argentine researchers, 59 Chilean, 28 Brazilian, 23 Uruguayan and 37 European and American. The symposia dealt with Glycobiology, Proteins, Signal Transduction, Lipids, Cell Biology, Proteomics, Plant Biochemistry, Gene Expression and Genomics. In addition, 12 plenary lectures and many oral presentations were given and several hundreds of posters were displayed.

But we have a problem, in Argentina. We have more skilful and well-trained young investigators than positions available in our institutes. So they emigrate to other countries which have better facilities. Policies are urgently required to prevent this migration, by the generation of new facilities and funding sources that make it attractive to the younger generations to do biochemical research in this corner of Latin America.