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PAHO/WHO IMMUNOLOGY RESEARCH AND TRAINING CENTERS

(Item 7 of the Agenda)

## PAHO/WHO IMMUNOLOGY RESEARCH AND TRAINING CENTERS

### PROBLEM

Immunology is a rapidly developing science. There can be no doubt that postdoctoral personnel competent in basic immunology and in modern immunological techniques are now indispensable to any major health center. Rapid developments are in progress in transplantation, immunopathology, knowledge of the structure and function of immunoglobulins, cellular differentiation, and genetics. It is clear that immunology now deserves attention as a central part of biology and medicine and that the subject is no longer restricted mainly to serological techniques and immunization procedures. However, in spite of the broadening scope of immunology, the phenomenon of immunity to infectious diseases is poorly understood and vaccination remains an empirical procedure. Pertinent knowledge will probably be gained by a closer study of the immunology of parasitic diseases. In order to develop harmoniously, a program in immunology should keep abreast of research developments all over the world and cooperate closely with the institutions engaged in such work.

### METHOD

Two PAHO/WHO immunology Research and Training Centers have been set up for the Americas: one in São Paulo, Brazil, at the Butantan Institute, and one in Mexico City, coordinated through the Children's Hospital, which utilizes the laboratory facilities and permanent staff of seven cooperating institutions.

The São Paulo center offers an annual course on the theory and laboratory techniques of immunology for students from Brazil and from abroad, as well as a research program on basic immunological mechanisms and their applications to local public health problems.

The Mexico center runs a three-year academic course leading to a Ph.D. degree in immunology and also shorter courses and seminars. These courses are open to students from the whole of Latin America. It also has a research program which is devoted to basic immunology and to the immunology of diseases and conditions presenting a local health problem.

## RESULTS TO DATE

The main objective of the São Paulo center is to provide postgraduate training in basic immunology for candidates from Latin American countries and to develop immunological research projects directly or indirectly related to public health problems in the Region. Four annual eight-month training courses have been organized since 1966. The last two courses included students from Argentina, Chile, Jamaica, Peru, and Uruguay, as well as Brazilian trainees.

Visiting lecturers and examiners from the United States and Europe have participated in both the teaching and research aspects of the Center's activities. In 1969, research included work on the responses of patients with Brazilian pemphigus foliaceus to treatment with immunosuppressive drugs; on the biological significance of the heterogeneity of immunoglobulins for the purpose of determining which are active in protecting against infectious agents and which contribute to tissue damage by hypersensitivity reactions (allergy and immunopathology); and on the mechanism of the hemorrhagic reaction produced in the skin of normal laboratory animals by the sera of Brazilian pemphigus foliaceus patients. Future research will concentrate on the immunochemistry of venoms and antivenoms of the two major groups of snakes in Brazil: Crotalus and Bothrops.

The following laboratories cooperate in the activities of the PAHO/WHO Immunology Research and Training Center at Mexico City:

Laboratorio de Inmunoquímica, Hospital Infantil de México

Laboratorio de Inmunología, Instituto Nacional de Cardiología

Laboratorio de Inmunoquímica, Escuela Nacional de Ciencias Biológicas del Instituto Politécnico Nacional

Laboratorio de Investigaciones Inmunológicas, Secretaría de Salubridad y Asistencia

Laboratorio de Inmunoquímica de la Facultad de Medicina, Universidad Nacional Autónoma de México

Departamento de Inmunología, Instituto Nacional de Nutrición

Laboratorio de Inmunopatología, Instituto de Investigaciones Biomédicas de la Universidad Nacional Autónoma de México.

The Center at Mexico City differs from the one at São Paulo in that it is not localized in one institution. It has brought together a group of enthusiastic and capable workers who are cooperating well and have created an atmosphere of interest in immunology, immunochemistry, and immunopathology.

Two graduate students have finished the academic curriculum and are working on their theses. Two other students are in the second and third years, respectively, and four additional students are in the beginning phase of the academic course. There have been short courses by visiting immunologists and also regular weekly academic meetings.

Research is being carried out in the following areas: studies of the common antigen (Kunin) of E. coli in relation to infant diarrheas; the relationship between malnutrition and immunity; antigenicity to rabbits of IgG in various states of aggregation, and its implications in immunological tolerance and rheumatoid arthritis; complement components in rabbits in relation to immune responses, including rejection of transplants; immunochemical properties of polysaccharides from M. tuberculosis, M. leprae, N. brasiliensis, N. asteroides, and K. rinoscleromatis; systemic lupus; anti-enzyme antibodies; laboratory models of anaphylaxis; erythrocyte groups and other genetic markers in normal and atopic populations; cell-mediated immunity in lepromatous and tuberculoid leprosy; anti-DNA antibodies in collagen diseases; experimental induction of anti-nuclear antibodies by different pharmacological agents; collagen antigenicity; delayed hypersensitivity with special reference to cytotoxic effectors; and production of antibodies to guinea pig macrophages.

#### SIGNIFICANCE

Experienced scientists agree that applied research will flourish only if it is constantly nourished by ideas, techniques, and findings derived from basic research. It is therefore shortsighted for any region of the world not to devote a reasonable share of the resources available to the support of basic research, particularly in the field of immunology, where there is often only a short step between basic findings and their application in therapy and prophylaxis. A laboratory for basic research can be maintained

at relatively small expense and can prove a tremendous asset as a continuing source of inspiration and intellectual support of those who are applying immunology in public health.

The establishment of centers for research and training in immunology in Mexico City, São Paulo, Ibadan (Nigeria), Singapore, and Lausanne by PAHO/WHO is one of the mechanisms by which the Organization is helping to create the trained scientific manpower essential for promoting regional and local studies in the countries where tropical diseases exist.