

Master's Degree in Basic Immunology at The Havana Medical University, Cuba

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Abstract

Introduction: Immunology is, like no other, a transdisciplinary specialty that intervenes in all medical functions. The Master's Degree in Basic Immunology at the Medical University of Havana is aimed at immunological foundations at a biomedical, preclinical and clinical level.

Methodology: A master's program of national and international scope was designed, in a part time mode. The teaching staff is made up of the professionals with experience in the area of knowledge of the program, professors with researcher categories and higher teaching categories, with academic titles of first- and second-degree specialists, masters and doctors in sciences and the special status of professor's consultants and merit. The thematic plan was made up of three areas and eight modules.

Results: 15 master's degrees were obtained in the first edition, the majority worked on their research topics were associated with COVID-19 and other topics related to Immunology. The percentage of graduates was 53.5% compared to the initial enrollment. A second edition was opened with an enrollment of 31 masters with a heterogeneous composition in terms of their specialties and professions within the health sector. The first two modules have been taught with 100% approval. In module one, 87% are in the excellent or validated categories; while in module two 84.2% are in these categories. The teacher satisfaction survey shows satisfactory results.

Conclusions: The program has 15 graduates within the first edition and has just opened its second edition with 31 enrolled teachers with a high level of motivation to study its contents.

Keywords: graduate education; courses; motivation; publications

Introduction

Immunology is, like no other, a transdisciplinary specialty that intervenes in all medical functions (promote, prevent, diagnose, cure, prognosticate and rehabilitate), but above all in preventing. In this way, it provides solutions to health problems related to the conditions of the immune system that constitute the etiopathogenesis of multiple diseases and their interrelationship with other systems. This discipline shows experimental scientific thinking in daily work, which is why it is biomedical. This biomedical character is determined by the fact that it uses the experimental method, based on a scientific, ethical and humanistic world view, as a fundamental way of applying the scientific method in the acquisition of new knowledge. These are the methodological basis for training and the possibilities it offers for the

interpretation of the results, based on the development of systemic thinking oriented towards the analysis and diagnosis of health. What translates into being preclinical experimental and being present in preclinical and clinical spheres [1]. This allows the understanding of scientific knowledge and the necessary concepts and methods acquired at a preclinical experimental level in laboratory animals, consolidated at a clinical level in humans, and after acquired and understood, apply it to medical sciences. What is done through disease and risk prevention actions and health promotion that are particular to this specialty and essential in the comprehensive medical care where the future specialist will be inserted, but not limited to it [2].

The immune system, like the nervous and endocrine systems, is a regulatory system that intervenes in the homeostasis of the organism, with the particularity

that immunology integrates into psycho-neuro-endocrine-immunology and, unlike the others, it also achieves homeostasis at the tissue level, repairing damaged tissues. The development of immunology has been dizzying in recent years, consequently a constant update is required [3].

The Master's Degree in Basic Immunology at the Havana Medical University is aimed at the immunological foundations at the biomedical, preclinical and clinical level of the participants so that they are able to appropriate the knowledge at the level of the healthy human and the hypersensitive syndromes that give foundation of immunopathological mechanisms as well as applying them to the main diseases at a clinical level where knowledge of immunology is decisive.

Methodology

A Master's program of national and international scope was designed. The faculty of professors is made up of professor's professionals with recognized experience in the area of knowledge of the program and Medical Sciences, professors with researcher categories and senior teaching categories of full and assistant professors, for the most part, with academic titles of First and Second Grade Specialists, Masters and Doctors in Sciences and the special status of Consultant and meritorious professors. They are also distinguished by belonging to national and international scientific societies and by outstanding participation in national and international conferences.

The Immunology Department of Giron Faculty in Havana Medical University has 44 years of experience in training Immunology Specialists. More than 500 Immunologist have graduated from it. The research results have been relevant for obtaining the vaccine against hepatitis B, the development of Immunoepidemiology, Vaccinology and Adjuvants.

The current lines of research of the Master's Degree in Basic Immunology are: Characterization of the mucosal immune response against pathogens and commensals; development of mucosal adjuvants derived from commensals and unitemporal vaccines; characterization of the immune response, particularly the mucosal response In chronic low-grade inflammation: stress, obesity, alcoholism, immune senescence, infertility and diabetes; vaccine immune response in atopic people and in critical stages of life: premature babies, low birth weight, children who were not breastfed, born by cesarean section and

senescence; development of study programs, means and evaluative technologies for undergraduate and graduate teaching on immunology for medical sciences; as well as the development of training interventions for health personnel involved in the diagnosis and management of immunodeficiency disease and in vaccination work within the National Health System, clinical trials and health intervention to demonstrate efficacy and effectiveness of the anti-SARS-CoV-2 immunization schedule, as well as booster reimmunizations; development of diagnostics tools in collaboration with the specialty of Imaging (thymus ultrasound) in the scrutiny of immunodeficiency disease in children with recurrent infections in Pediatric Immunology consultations of primary and secondary care, clinical and immunological evaluation of patients suffering and on immunotherapeutic treatments for cancer, autoimmune disease as well as the evaluation of histocompatibility and other serological markers in subjects who will undergo tissue and organ transplantation; clinical, immunological evaluation and therapeutic interventions in patients convalescent from COVID-19 and/or with sequelae of said disease; clinical, immunological evaluation and therapeutic interventions in patients living with HIV.

Among the entry requirements for the master's degree is being a health professional, Cuban or foreign. The Academic Committee of the Master's Degree in Basic Immunology is made up of seven professors of great prestige in teaching, assistance and research in the area of Immunology. It evaluated the requirements provided by the applicants and ruled on their approval or rejection. Face-to-face interviews were carried out with the applicants.

Thematic plan

Biomedical Area: This area consists of two modules. Module 1: Structure, maturation and immune recognition mechanisms. Module 2: Immune effector and homeostatic mechanisms.

Clinical Area: This area consists of two modules. Module 3: Immunological clinical method. Module 4: Immunoassays.

Teaching, Research and Direction Area: This area consists of four modules. Module 5: Tutorial work: project preparation, execution, pre-defense and thesis defense; Module 6: Methodological teacher; Module 7: Writing publications; Module 8: Research grant writing.

Results and Discussion

Most of the teachers joined the fight against COVID-19 and several theses were related to this disease, either about the results of clinical trials of anti-SARS-CoV-2 vaccines and biological treatments used in the fight to the pandemic as well as the follow-up and clinical-immunological study of convalescent patients from COVID-19, also about the study of the consequences of COVID-19 and the implications of immunology. The centers and professors of the faculty have been involved in the design, obtaining of vaccines against SARS-CoV-2, in the clinical trials of the vaccines, the development of immunotherapies against COVID-19, the development of diagnostics, also working on assistance in COVID-19 patient's attention zones; obtaining a novel adjuvant derived from probiotics, a new treatment against COVID-19 evaluated preclinically. This allowed that in a pandemic scenario, far from weakening the current master's degree, it was strengthened and it was possible to train science teachers with extensive knowledge and methodological skills that will contribute to their development and comprehensive training, as well as to the strengthening of competitiveness in the design, approach and execution of research projects that contribute to solving specific problems in medical practice [4].

Students and professors were also involved in the vaccination centers that operated throughout the country both in the health sector and in mass population vaccination. Despite the National Health System and the BioCubaFarma centers being heavily involved in confronting the COVID-19 pandemic, other lines of research were not neglected. Highly significant was the number of publications among members of the faculty, tutors and teachers, which amounted to 70. This result is very satisfactory since the publication rate of the professors of the faculty and academic committee of a master's program as

well as their students constitutes a sample of positive contribution with high teaching and research preparation [5]. During the two-year duration of the course of the first edition of the master's degree, of the 15 masters who managed to finish and obtain their degree as a Master in Basic Immunology, 8 of them managed to publish results of their research in the following scientific journals: Cuban Journal of Hematology, Immunology and Hemotherapy; Medic Review; Biomedical Research Cuban Journal; Medical Human Genetics Egyptian Journal; Immunobiology; UO Medical Affairs [6-13].

The 15 masters qualified within the duration of the first edition of the master's degree were doctors specializing in Immunology. The percentage of graduates was 53.5% compared to the initial enrollment. On December 13, 2023, the inauguration ceremony of the second edition of the master's degree in Basic Immunology was held. On this occasion, with 31 registered masters after a rigorous applicant selection process that included interviews where the personal motivation to study Immunology in the part time Master's modality was explored [14].

In the manner described above, our new master's student body was formed as follows:

Fourth-year Immunology Resident Physicians: 10

Third-year Immunology Resident Physicians: 11

Physicians Specializing in Pediatrics: 3

Physicians Specializing in Hematology: 1

Physician Specializing in Psychiatry: 1

Second year Family Medicine Resident Physician: 1

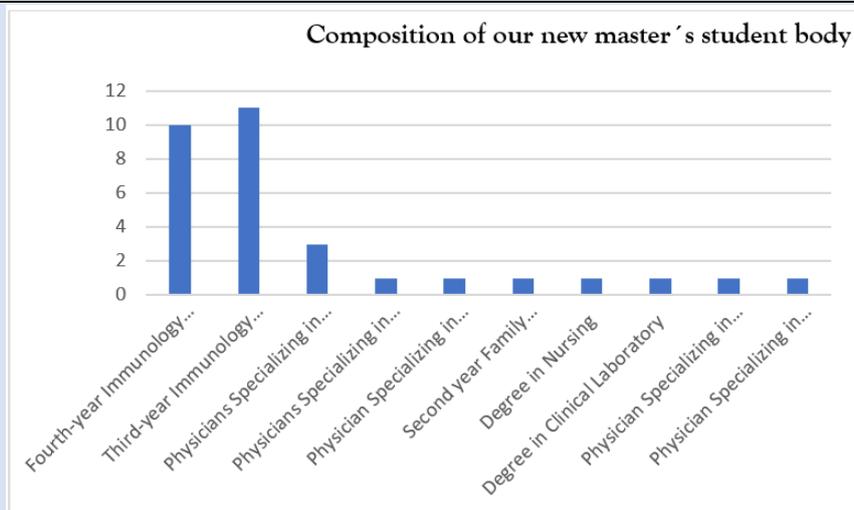
Degree in Nursing: 1

Degree in Clinical Laboratory: 1

Physician Specializing in Histology: 1

Physician Specializing in Anesthesiology and Resuscitation: 1

This distribution of our new body of teachers according to their professions can be seen graphically in graph number 1 on the annexes.



Graphic 1: Composition of our new master's student body (second edition).

The first two modules have been taught with 100% approval. In module one, 87% are in the excellent or validated categories; while in module two 84.2% are

in these categories. The teacher satisfaction survey shows satisfactory results. The latter can be seen in tables 1,2,3 and 4 of the annexes.

Table 1: Results of module number I final evaluation. n=31.

| Aspect to evaluate | Excellent | Good | Regular | Validated |
|--------------------|-----------|------|---------|-----------|
| Number | 8 | 2 | 2 | 19 |
| Percentage | 25.8 | 6.0 | 6.0 | 61.2 |

The results of the total enrollment are shown.

Table 2: Results of module number II final evaluation. n=29.

| Aspect to evaluate | Excellent | Good | Regular | Validated |
|--------------------|-----------|------|---------|-----------|
| Number | 7 | 3 | - | 19 |
| Percentage | 22.9 | 9.7 | - | 61.3 |

At the time of closing these results, two teachers have not examined module II.

Table 3: Results obtained on teacher satisfaction survey with respect to the teaching-learning process. n=12.

| Aspect to evaluate | Very satisfied | Satisfied | Not very satisfied | Dissatisfied |
|---|----------------|-----------|--------------------|--------------|
| Duration of topics received | 8 (66.6%) | 4 (33.3%) | - | - |
| Distribution of topics throughout the program | 8 (66.6%) | 4 (33.3%) | - | - |
| Methodology used in classes | 11 (91.6 %) | 1 (8.3 %) | - | - |
| Periodicity of evaluations | 10 (83.3 %) | 2 (16.6%) | - | - |

The satisfaction survey was only applied to teachers who did not have modules I and II validated.

Table 4: Results obtained in the teacher satisfaction survey with respect to the organization of teaching. n=12.

| Aspect to evaluate | Very satisfied | Satisfied | Not very satisfied | Dissatisfied |
|---|----------------|-----------|--------------------|--------------|
| Has sufficient prior knowledge to follow the contents taught | 9 (75.0%) | 2 (16.6%) | 1 (8.3 %) | - |
| The topics taught expand your knowledge | 12 (100%) | - | - | - |
| The topics taught expand your skills and abilities | 12 (100%) | - | - | - |
| Help received from the teacher | 12 (100%) | - | - | - |
| The material meets your expectations | 10 (83.3 %) | 2 (16.6%) | - | - |
| The recommended bibliography has been useful | 12 (100%) | - | - | - |
| Evaluation quality | 12 (100 %) | - | - | - |
| Professor uses flexible educational and evaluative strategies to address individual differences | 11 (91.6%) | 1 (8,3%) | - | - |

The satisfaction survey was only applied to teachers who did not have modules I and II validated.

The heterogeneity of the master's student in this new edition represents a new challenge for the faculty and

academic committee, which is in the task of drawing up new teaching strategies for the satisfactory

development of the modules and research topics of the final projects of master's degree [14].

Conclusion

A Basic Immunology Master's program was designed, which is carried out at the Havana Medical University. This program was approved by the relevant authorities. The program has 15 graduates in the first edition and has just opened its second edition with 31 enrolled teachers with a high level of motivation to study its contents. The graduates of the first edition managed to present their master's completion projects on very up-to-date topics related to the development of Immunology, highlighting topics related to the COVID-19 pandemic. Eight publications were obtained from the students of that first edition distributed in six indexed scientific journals. In this second edition, the population of health professionals enrolled in the master's degree turned out to be heterogeneous, with resident doctors and specialists from different specialties, graduates in nursing and clinical laboratory.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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Cite this article: Hermes F. Hernandez, Irma V. Garcia, Antonio M. Rodriguez, L.M.R. Diaz, J.S.B. Hernandez, et al. (2024). Master's Degree in Basic Immunology at The Havana Medical University, Cuba, *International Journal of Biomedical and Clinical Research*, BioRes Scientia Publishers. 1(3):1-5. DOI: 10.59657/2997-6103.brs.24.011

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Article History: Received: May 06, 2024 | Accepted: July 01, 2024 | Published: July 08, 2024