

REVIEW ARTICLE

Iran J Allergy Asthma Immunol

May 2020; 19(Suppl.1):18-26.

Doi: 10.18502/ijaai.v19i(s1.r1).2851

Forty Years of Research and Treatment in Immunology and Allergy: In Honor of Professor Reza Farid Hosseini

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Received: 24 January 2020; Received in revised form: 25 March 2020; Accepted: 30 March 2020

ABSTRACT

In light of various supports of prodigious figures in the field of immunology and allergy, the subject area has been faced a great leap during the last century. The current state of the discipline owes an abundant appreciation for the scholars motivated in escalating the true nature of the science, who left no stone unturned in improving the general common sense and understanding of the human knowledge in general, and immunology and allergy in particular. Professor Reza Farid Hosseini is among the dignitaries who invested his life and energy on weaving the tapestry of the immunology and allergy. He delivered a great deal of influence on the field by his ethical devotion to science and was a significant contributor in the realms of the human immune system. His presence drastically rehabilitated the place of the Immunology in Iran, and the current paper seeks to review the personal and academic life of Professor Reza Farid Hosseini in honor and appreciation for his in-depth involvement in the field. The paper summarizes Professor Farid's childhood, school, and higher education, compilations, and translation of books, his contribution to the research both inside and outside of Iran, and scientific activities of Dr. Farid Hosseini.

Keywords: Allergy; Ethical devotion; Honor; Immunology

INTRODUCTION

Science is a tapestry made up of small threads of

abundant information. When they are arranged in the correct order, they reveal the figures of the principal patterns of the natural world. Scientists are the

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In Honor of Professor Reza Farid Hosseini

weavers of this tapestry. Professor Reza Farid Hosseini (Figure 1) is among the eminent scientists in the field of immunology and allergy in Iran. Through a series of notable features such as perseverance, patriotism, sympathy, and high ethical professionalism, he has created an evident solution to form a great picture of immunology and allergy in Iran. However, it is not merely the scientific groundwork that has distinguished him as a prominent figure. Rather, his central role is undeniable because of his great ingenuity in devising new therapies and establishing immunology and allergy disciplines. From the perspective of professional ethics, the standard framework in medical ethics analysis is the usage method of the "four principles" that have been assumed by Tom L. Beauchamp and James F. Childress in their book "Principles of Biomedical Ethics". The method identifies four basic and simple ethical principles that are measured and judged from the interaction with one another and draw one's attention to the extent and scope of their application. These four principles are: respect for self-determination, individual independence, profit-making, harmlessness, and justice.¹

Beyond the considerable combination of his great knowledge, creative thinking, and diligence, Prof. Farid also has other unique attributes such as kindness,

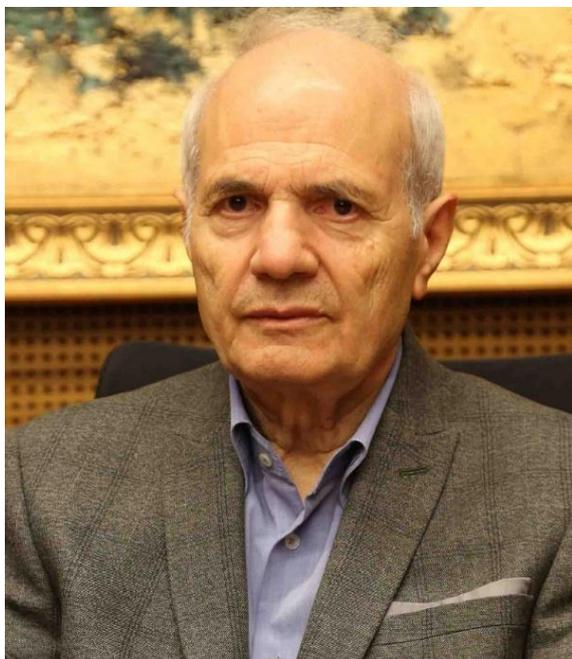


Figure 1. Reza Farid Hosseini (Professor of Clinical Immunology and Allergy, Mashhad University of Medical Sciences, Iran.)

generosity, modesty, and moral goodness with his students, colleagues, and patients.

A review of the academic life of Professor Reza Farid Hosseini confirms the existence of professional ethics criteria based on the abovementioned four principles. Since the presentation and reference of the scientific biography of great scientists can play an essential role in modeling and expanding scientific ethics and perception based on professional ethics, in this review article, we will explore the scientific and professional life of Professor Reza Farid Hosseini.

Birth and Childhood (1941-1948)

He was born 78 years ago in May 1941 on the birthday of Imam Reza in the holy city of Mashhad. His grandfather prayed at the shrine of Imam Reza that if the baby and his mother were healthy, they would name the baby Reza. Originally, he is from the village of Darrud (today, the city is called Darrud); rural districts of Neyshabur on the slopes of the Binalood chain Mountains by the rapid riverside and lush gardens, and beautiful valleys of Narmpa. His father, Sayyed Muhammad ibn Mir Abdullah, was one of the experienced and intellectuals of the Darrud. Professor Farid Hosseini lost his father at an early age. He spent his early childhood and elementary and secondary education in Darrud and then went to Mashhad with his mother and brothers.

Primary and Secondary Education (1948-1960)

He spent the primary courses at Hedayat Primary School in Mashhad and then, together with his brothers, went to work in the Mashhad's rug market for subsistence (Figure 2). Back then, scientific and cultural figures were plying to the market and had a friendship with the marketmen. Sometimes a coincidence or an encounter with a great person motivates people. One of these events was Professor Farid's encounter with philosopher Dr. Seyed Jalaluddin Ashtiani (professor of mysticism and philosophy at theology faculty of Ferdowsi University of Mashhad) at a young age. Dr. Ashtiani came to the carpet store to exchange the carpet of his house. Professor Farid's brother sent him to Professor Ashtiani's house to visit his rug. The discussion between him and Ashtiani and the advice given by Ashtiani motivated Professor Farid Hosseini to continue his studies.

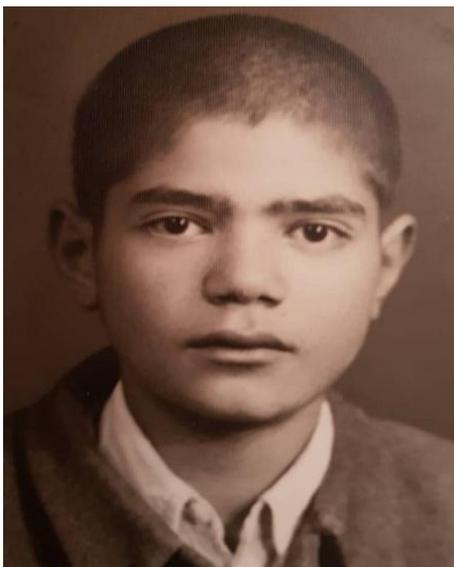


Figure 2. Reza Farid Hosseini (Primary School Education, Mashhad, 1951)

At the end of their conversation, Professor Ashtiani offered him a book of his compilation (Being in Philosophy and Mysticism) with a beautiful handwriting on it. This approach of a scientist dealing with a child was unique and instructive and encouraged him to learn. Besides, Professor Farid Hosseini's contact with Dr. Ali Shariati was established through the Islamic Truth Publishing Center during his adolescence, and he encouraged Professor Farid Hosseini to continue his studies as well.

Higher Education (1960-1970)

Her dream of becoming a doctor comes back to her meeting with Dr. Morteza Sheikh. Dr. Sheikh was one of Mashhad's most pious benevolent physicians, and whenever Professor Farid Hosseini brought his grandmother to his office, he treated them with sympathy and kindness so that becoming a physician has become a dream for him in his adolescence. Once he read in the Aftab-e Shargh newspaper: Those who are interested in pursuing high school education can follow their education through evening classes, and if their average grade is higher than 14.5 out of 20, they can take two c instead of one. He has worked hard to form an evening class with ten other people and has succeeded in obtaining a Natural sciences diploma during three years of round the clock endeavors. After all these attempts and struggles, he passed the entrance exam in the Dentistry of the Tehran University and Medicine of Mashhad University in 1963 (Figure 3).

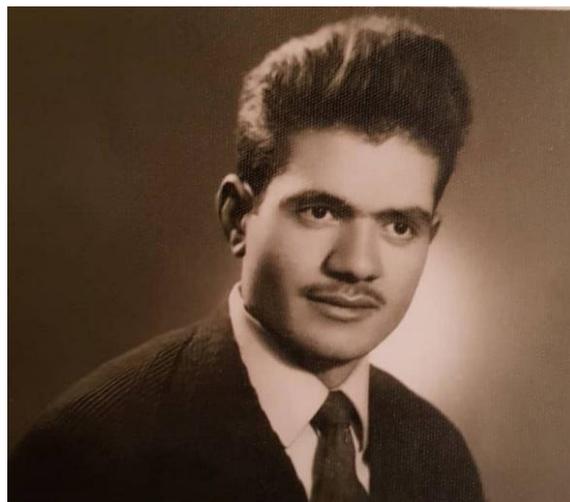


Figure 3. Reza Farid Hosseini (Medical Student at Ferdowsi University of Mashhad, 1964)

Eventually, he continued his studies at Medicine, following his brother's advice. Along with her medical education, he also benefited from Dr. Shariati's lectures at the Faculty of Literature until Dr. Shariati introduced him to his wife's family for marriage.

Education Abroad (1970-1978)

Professor Farid Hosseini married his wife, who held a bachelor's degree in literature, on the edge of his graduation in 1970, and went to England to continue his education. He received an application from the University of Manchester, and then went to the University of London after a year and obtained a specialty in Internal Medicine at St. George Hospital, London, in 1973. He then obtained a subspecialty in Pulmonary Medicine from the Cardiff University of Wales, where he became acquainted with immunology in 1974. His first confrontation with the immunology was the observation of the word "IgG" in the form of patients' medical history, which until then was unknown to him. Searching in reference books did not work, so he asked one of the senior residents about the matter. The resident explained, "The immunoglobulins family is a group of blood proteins that have recently been isolated from serum by scientists in New York through electrophoresis." The discovery coincided with the start of the modern science of immunology in the world, and the University of London was one of the pioneers of immunology.² His second encounter with immunology was in the classroom of renowned immunologist, Professor Ivan Roitt. "Future physicians are not prescribers because the science of immunology

In Honor of Professor Reza Farid Hosseini

is rapidly advancing, and the structure and pathophysiology of many diseases are related to functional impairment or immune system dysfunction," said Professor Roitt in his class to Farid Hosseini. He proceeded his studies in Fellowship in Immunology and Allergy at Chelsea College in 1976 and then went to the United States. After acquiring new-fangled knowledge in immunology and allergy from the American Academy of Allergy, Asthma, and Immunology, he succeeded in obtaining a Fellowship in 1978. Two of his prominent professors in London were noticeable scientists, Professor Jack Pepys, the father of Allergy in England and inventor of the Skin prick test, and Professor Deborah Doniach, a pioneer in the perception of the mechanisms of autoimmune diseases (Figure 4). Professor Farid Hosseini, led by Professor Doniach, developed the theory of autoimmune type 1 diabetes for the first time.

Homecoming

Finally, after gaining sufficient knowledge and experience in internal diseases, lung diseases as well as immunology and allergy, he returned to Iran in 1978 following the invitation of Mashhad University, Faculty of Medicine. He had already decided to return home.

At that time, the field of immunology was not very active in Iranian universities. Immunology was taught



Figure 4. Left to Right: Professor Deborah Doniach, Professor Ivan Roitt (Seminar “Self and Non-Self”, London, 1995)

to students under the topic of microbiology. Indubitably, the efforts of Prof. Mohammad Mirdamadi (Father of Serology), Prof. Gholamreza Nazari, Prof. Abolhassan Farhoudi (Father of Clinical Immunology and Pediatric Allergy) at Tehran University, Faculty of Medicine (Figure 5) as well as Prof. Hassan Tajbakhsh (the author of the first book of modern immunology in Iran, academic tenure and ever-lasting name) in the faculty of veterinary medicine of Tehran were effective in developing knowledge of immunology and allergy (Figure 6).



Figure 5. Left to Right: Reza Farid Hosseini, Paul Feinberg (Professor of Immunology, London University), Abolhassan Farhoudi (Professor of Clinical Immunology and Allergy, Tehran University of Medical Sciences), International Allergy Congress, London, 1988.



Figure 6. Left to Right: Reza Farid Hosseini, Hassan Tadjbakhsh (Professor of Immunology, Tehran University), 13th Iranian Congress of Immunology and Allergy, Tabriz, 2016.

Professor Reza Farid Hosseini launched the first immunology and allergy ward at Qaem Hospital in Mashhad in 1979. Besides, an immunology laboratory was established to measure rheumatoid factor (RF), C-reactive protein (CRP), and electrophoresis. He also suggested holding several independent immunology courses for fourth-year medical students and hospital interns. Coinciding with the closure of universities by the Cultural Revolution Campaign, Prof. Farid Hosseini collaborates with Prof. Ahmad Masoud, Prof. Behrooz Nikbin, and Prof. Mohammad Bagher Islami from Tehran University to review medical course titles and established MSc and Ph.D. programs in Immunology. With the cooperation of Prof. Abolhassan Farhoudi (Professor of Tehran University of Medical Sciences), Prof. Naser Javaherrash (Professor of Iran University of Medical Sciences) and Prof. Reza Amin (Founder of Clinical Immunology and Allergy at Shiraz University of Medical Sciences), Prof. Hosseini established the sub-specialized field of Clinical Immunology and Allergy in Iran in 1982. Prof. Reza Farid Hosseini's other innovations include the proposal to create a sub-specialized field of Rheumatology in Iran.³

Compilations and Translation of Books and Articles

Prof. Reza Farid Hosseini is the author of more than 30 volumes and 80 scientific articles of immunology

and allergy. His book "Fundamentals of Immunology" is one of the most comprehensive books used in Iranian universities. Its latest edition, with the cooperation of Iranian immunology professors, has reached more than a thousand pages and has been republished in 2014 by Behnashr-publisher. He first translated the famous textbook "Cellular and Molecular Immunology," authored by Prof. Abul K. Abbas *et al.*, in collaboration with Dr. Hassan Baradaran and Dr. Abdolrahim Rezaei in Iran in 1988 and published by Jahadedaneshgahi-publisher. This book was selected as the book of the year in the Islamic Republic of Iran. These translations have been done in conjunction with editions of this book, and most recently, he and his colleagues have translated the ninth edition of the book published in 2018 by Ebnesina-publisher. One of the best books authored under the supervision of Professor Reza Farid Hosseini is "The Tao of Immunology" by Dr. Farhad Farid Hosseini (his son, psychiatrist and faculty member of Mashhad University of Medical Sciences) and Dr. Homan Kaghazian. This book combines the scientific contents of immunology with the mystical topics of famous mystics such as Attar and Rumi astoundingly and published by Behnashr in 2002. Other comprehensive and valuable books he has authored include "The History of Immunology and Allergy in Iran and the World" (Figure 7). This book was written

by Prof. Reza Farid Hosseini, Prof. Behrouz Nikbin, and Dr. Reza Jafari in collaboration with the Iranian Academy of Medical Sciences and published by Ebnesina in 2018.³

Basic and Clinical Research

History of HTLV-1 Isolation in Iran

One of the most interesting and important areas of Prof. Farid's research is the identification, diagnosis, and treatment of patients with malignancies or neuromuscular disorders caused by human lymphotropic T virus type (HTLV-1) in Iran.⁴⁻⁹ Years before the discovery of retroviruses, patients with multiple sclerosis, mycosis fungoids, and adult leukemia were observed in Khorasan by Professor Reza Farid Hosseini *et al.* at Ghaem Hospital in Mashhad.

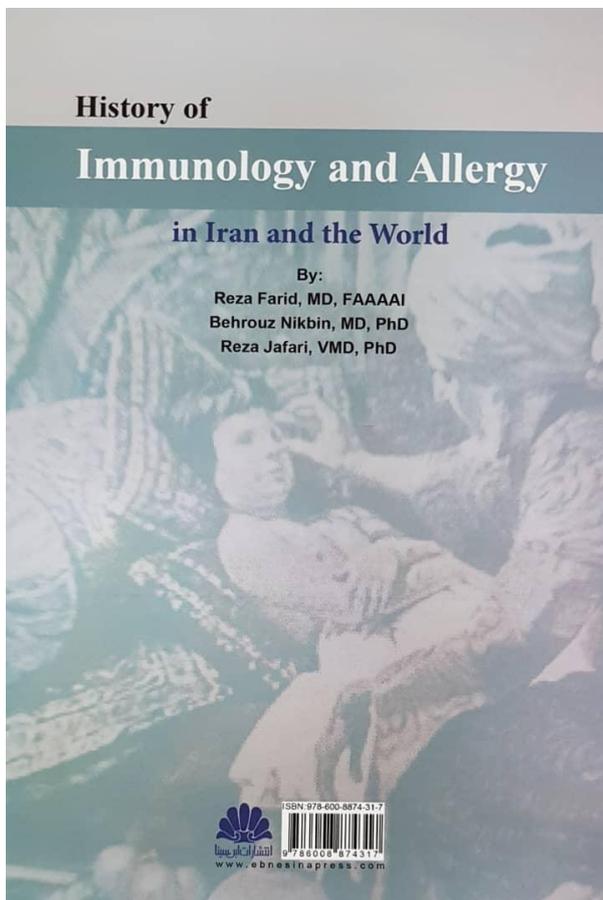


Figure 7. "History of Immunology and Allergy: in Iran and the World" edited by Reza Farid Hosseini, Behrouz Nikbin (Professor of Immunology, Tehran University of Medical Sciences), and Reza Jafari (Assistant Professor of Immunology, Urmia University of Medical Sciences), Published by Ebnesina in 2018.

At that time, these diseases were mistakenly called "Khorasan disease"¹⁰. Following the discovery of HTLV-1 in 1980 in Professor Robert Gallo's laboratory by Bernard Poiesz in mycosis fungoid patients, Prof. Taka Tsuki in Japan isolated the virus in leukemia patients and serologically diagnosed it with Prof. Robert Gallo assistance.¹¹⁻¹⁴ Professor Farid Hosseini and Prof. Abbas Shirdel (Hematologist and Oncologist) in Mashhad, in collaboration with Prof. Seyyed Ziauddin Tabeei (Hematopathologist) in Shiraz, reported patients with Adult T-cell Leukemia (ATL). Because serological test was not still available in Mashhad at the time, Prof. Farid Hosseini took the samples to the United States and was diagnosed with HTLV-1-induced lymphoma in the laboratory of Prof. Thomas A. Waldmann for the first time in Iran. Later, during his scientific trips to Cornell University Hospital in New York, he noticed that these skin, blood, and nervous disorders were also observed among Mashhad Jews immigrating to the United States. After meeting Professor Bijan Safai (Head of the Department of Dermatology at Cornell University), he was encouraged by Dr. Safai to investigate the outbreaks of retroviruses in Mashhad and thus isolated HTLV-1 for the first time in Iran.⁷ Since then, one of his and the Mashhad Immunology Department's main research areas have been identifying outbreaks and HTLV-1 therapeutic protocols.^{15,16} One of the designed therapeutic protocols was successful and has increased the survival rate in patients, and its results have been published in highly accredited journals.^{4,17} It should be noted that Khorasan has historically been the gateway between East and West and is located on the Silk Road, where Chinese, Indian, and Jewish merchants traveled. The assumptions about the prevalence of HTLV-1 in Khorasan have been explained and described by Professor Farid Hosseini. Hypothesis 1: Transmission of the virus through African slaves. For example, during the Medes and Mongols, millions of slaves from Africa entered Khorasan. Hypothesis 2: Spreading the virus through pilgrimage trips coming from distant lands such as India, Pakistan, and Africa to Khorasan. Hypothesis 3: Transmission of the virus through Indian merchants. Given the origin of HTLV-1 in Iran is Indian-African, this hypothesis may be significant. Hypothesis 4: The virus could have spread through Mashhad Jews. The prevalence of the virus among Jews has been increased due to inter-group marriages and relationships that are characteristics of minorities.¹⁰

History of Allergen Immunotherapy in Iran

Another part of Prof. Reza Farid Hosseini's research on immunotherapy in allergic diseases. The oldest historical document on immunotherapy relates to the Persian king Mehrdad VI (132 to 63 BC), a descendant of Cyrus the Great. He, under the advice of physicians, to be safe from poisons, received daily supplemental amounts of extracts of weakened poisons, until, at the time of his defeat by the Roman Emperor, the cup of poison did not affect him and asked his bodyguard to kill him with his sword.³ In 1954, the first clinical trial was done by a renowned English physician, William Franklin, and allergen immunotherapy was recognized worldwide.¹⁸ The first person to introduce immunotherapy in Iran was Dr. Mohammad Beheshti, a professor of Tehran University of Medical Sciences and a professor of allergy. He and his two colleagues established the first Iranian Allergy Clinic in Tehran in 1969.³



Figure 8. Left to Right: Reza Farid Hosseini, Mostafa Moin (Professor of Clinical Immunology and Allergy, Tehran University of Medical Sciences), 3th Iranian Congress of Immunology, Asthma, and Allergy, Mashhad, 2016.

Then allergen immunotherapy was established and introduced by Professor Reza Farid Hosseini at Mashhad University of Medical Sciences.^{19,20} Prof. Reza Farid Hosseini, in collaboration with Prof. Abolhassan Farhoudi and Prof. Mostafa Moin had a significant impact on the establishment of the Iranian Society of Asthma and Allergy (ISAA), which was found on 1996, June 26. Moreover, he has had

scientific cooperation with Immunology, Asthma, and Allergy Research Institute (IAARI) of Tehran University of Medical Sciences since 2000.^{3,21} Subsequently, Prof. Reza Farid Hosseini and his academic co-workers at the Department of Immunology instituted the Allergy Research Center at Mashhad University of Medical Sciences in 2011 (Figure 8).

CONCLUSION

Prof. Reza Farid Hosseini has trained many students (more than 20 Ph.D. students and 10 Fellowships), most of whom are scholars, academics, and specialized and skilled physicians in Iran and around the world. Some of them are: Nazli Azimi (Professor of Immunology, Founder, and President of Bioniz Therapeutics Inc.), Amir Sabouri (Professor of Neuroimmunology at Washington University), Farahzad Jabbari-Azad (Professor of Allergy and Clinical Immunology at Mashhad University of Medical Sciences), Abdolrahim Rezaei, and Houshang Rafatpanah (Professors of Immunology at Mashhad University of Medical Sciences). Dr. Farid can undoubtedly be called experts of professors. In this regard, according to the suggestion of Prof. Alireza Ranjbar in Bonn/Germany, in collaboration with Allergy Research Center in Mashhad under the leadership of Dr. Farahzad Jabbari-Azad, the magnitude of Prof. Reza Farid Hosseini was dignified in the Third International Congress of Immunology, Asthma and Allergy, which was held on 3-6 May 2016, in Mashhad (Figure 9). One of his most prominent scientific features is that he always appreciates learning. He always reads new-fangled materials on basic and clinical research related to immunology and allergy from accredited journals and reference books and shares them with young students and residents. He is a remarkable instance of a scientist, who is modest about science and did not hesitate over learning something new even from his students.

The ethical characteristics of Professor Farid Hosseini include the attentive efforts in developing scientific and professional of people. Furthermore, he is also a kind and generous person, helping to meet the needs of the underprivileged. He is a true sample of a good human being in pursuing the needs of poor people. He has undoubtedly been one of the promoters of the pure Iranian culture and the ethics of the Prophet

In Honor of Professor Reza Farid Hosseini

Mohammed and has been a constant member of the Iranian Academy of Medical Sciences for many years, and his name will always shine like a glittering star in the Iranian sky.



Figure 9. Left to Right: Reza Farid Hosseini, Alireza Ranjbar (Professor of Clinical Immunology and Allergy, Institute of Interventional Allergology and Immunology, Bonn/Cologne, Germany), 3th Iranian Congress of Immunology, Asthma, and Allergy, Mashhad, 2016.

ACKNOWLEDGEMENTS

The authors are grateful to Prof. Reza Farid Hosseini for providing considerable collective memories and photos.

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