American Association of Avian Pathologists
Biographies of Professionals in Poultry Health

ALY M. FADLY
1941-

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The Life of Aly Fadly

Early Years in Egypt

In 1958, at the age of 17, I passed my national high school examination in Egypt with a score that qualified me for either the College of Dentistry at Alexandria University or the College of Veterinary Medicine at Cairo University. Having been born and raised in Cairo, I decided to enroll in the latter. It was at that time that I began to envision my future as a veterinarian, despite the fact that my experiences with animals had been limited up until that point in my life. The only relevant experience that stands out was a few summer visits to my sister and her husband's farm 50 miles north of Cairo.

I completed my studies at Cairo University and became a licensed veterinarian in 1964. My first job was as a veterinary research scientist at the Egyptian National Animal Health Research Institute in Cairo. I was hired to be part of a team of scientists conducting research on fowl and sheep pox viruses and working toward improving available vaccines. In 1966, I was accepted as a PhD student in the Department of Internal Medicine at Cairo University's College of Veterinary Medicine. One year later, the 1967 War started and the resources available for university research became scarce. As such, the prospects for completing my graduate studies in a reasonable time were bleak. So I turned my attention to graduate programs abroad. I applied for an immigrant visa to the United States of America and received a P3 (Preference 3) visa—a visa for professionals working in fields in which there is a shortage in the US.

Studies and Appointment at Purdue University (1969-1976)

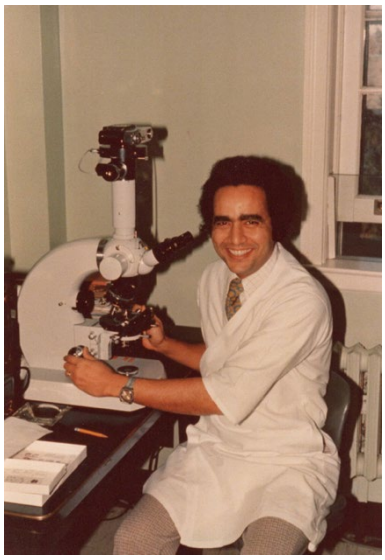
I travelled to Purdue University in West Lafayette, Indiana, in September 1969. I chose Purdue primarily because of a distant relative, Professor Dr. Sayed Gaafar, a distinguished veterinary parasitologist who was on the faculty at the university's School of Veterinary Medicine. My hope was that he would help me and introduce me to his colleagues in the School's various departments. I was very fortunate that he introduced me to Professor Dr. Roland Winterfield (pictured here with me), a world renowned scientist in the area of poultry diseases. In the fall of 1969, I worked during the day as a technician in Dr. Winterfield's laboratory, assisting him in his research and diagnostic efforts, focusing on infectious bronchitis, infectious bursal disease, as well as other viral infections of poultry. In order to supplement my income, I spent my evenings sterilizing laboratory glassware in the kitchen of Purdue University's Animal Disease Diagnostic Laboratory.

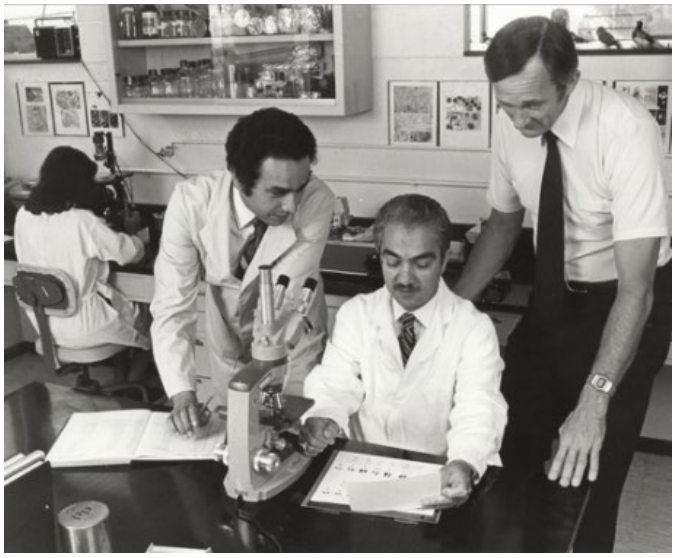
In January 1970, I was appointed as Professional Assistant and Graduate Student in the Department of Microbiology and Pathology to work under the supervision of Dr. Winterfield (pictured here with me and Dr. Anthony Gallina); I was Dr. Winterfield's first graduate student. For the next five years, I worked under his supervision; it was a great opportunity for me to expand my knowledge significantly in the area of viral infections of poultry. The plan of both my MS and PhD degrees called for isolation and identification of the causative agent, as well as to elucidate the immunopathogenesis of the inclusion body hepatitis (IBH)/anemia syndrome, recognized at that time to be an economically important disease of broiler chickens. The research demonstrated that the IBH/anemia syndrome was caused by a filterable agent, and further characterized this agent as a non-oncogenic avian adenovirus. It was also found that such adenoviruses caused greater disease in immunosuppressed chickens than in normal chickens. This original work established the etiology of a new poultry disease and pointed out the interaction between adenovirus-induced disease and immunodepression caused by infectious bursal disease virus.

I was granted the MS and PhD degrees from Purdue University in 1973 and 1975, respectively. I was also granted my US citizenship in 1975. Shortly after completing my doctorate, I was appointed as Assistant Professor in the Department of Microbiology and Pathology at Purdue's Veterinary School with a primary focus on poultry diseases. After almost two years in this position, I was recruited by Drs. Richard Witter and Graham Purchase to join the staff of the USDA Avian Disease and Oncology Laboratory (ADOL), formerly known as Regional Poultry Research Laboratory, in East Lansing, Michigan.

Years at ADOL in East Lansing, Michigan (1976-2015)

In December 1976, I joined the scientific staff at ADOL with primary assignments to work on Avian Leukosis and on a new research program established at ADOL to address hemorrhagic enteritis of turkeys and infectious bursa disease. In 1982, I became a Lead Scientist overseeing the retrovirus research of the group. (The picture below on the right was taken in 1983 and includes Drs. Keyvan Nazerian and Richard Witter.) From 1999 until I retired in 2015, I served as the Research Leader and Laboratory Director of ADOL.





Synopsis of Research Interests and Accomplishments at ADOL

Immunopathogenesis, diagnosis and control of avian retroviruses

During the late 1970s and 1980s, our retrovirus research program was aimed at improving diagnosis and control of avian leukosis virus (ALV) in egg-laying breeders. In 1979, and in collaboration with Drs. Eugene Smith and William Okazaki of ADOL, our team developed the first ELISA test for detection of ALV group-specific (gs) antigen; this test proved to be the most economical and rapid test for monitoring breeder flocks for ALV shedding. It was also the cornerstone in developing successful programs for reducing and eradicating ALV infection from primary egg-laying stocks. Since its development, this ELISA test has been and is being used routinely and extensively by poultry primary breeders to screen their flocks for ALV infection. During the 1980s, our team worked closely with primary egg-laying breeders and assisted them to significantly reduce or completely eradicate ALV infection from their stocks; such collaborative efforts allowed some of the breeder companies to advertise that they now have ALV-free stocks.

Pathogenesis of enhancement of retrovirus-induced bursal lymphomas by serotype 2 Marek's disease virus

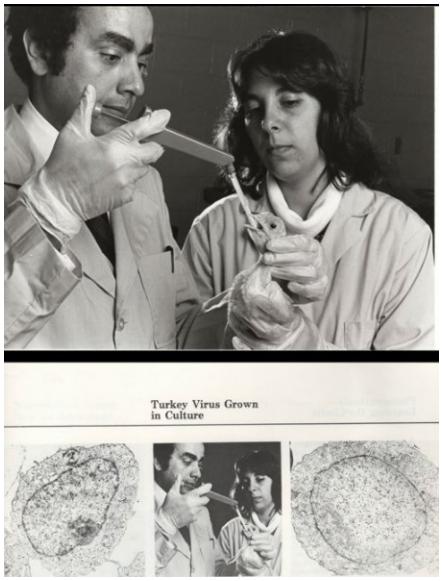
Following the finding by Dr. Larry Bacon of ADOL that serotype 2 Marek's disease virus (MDV), a vaccine commonly used in commercial flocks, enhanced ALV-induced bursal lymphomas in certain lines of chickens, our group conducted research that demonstrated such enhancement of ALV-induced bursal lymphomas can occur in chickens infected with serotype 2 MDV within only six weeks after infection with ALV at hatch. We also demonstrated that serotype 2 MDV may enhance reticuloendotheliosis virus (REV)-induced bursal lymphomas, but not REV-induced nonbursal lymphomas. The work also established that the enhancement effects of serotype 2 MDV

on REV-induced bursal lymphomas is similar to that induced by ALV, an unrelated avian retrovirus, and that such effects may be at the stage of formation of hyperplastic or transformed bursal follicles. These accomplishments demonstrated, for the first time, that chickens susceptible to serotype 2 MDV-induced enhancements of ALV-induced bursal lymphomas are equally susceptible to REV-induced bursal lymphomas. These studies demonstrated to the poultry breeders and growers that in order to control losses from ALV or REV-induced bursal lymphomas, exposure of chickens to serotype 2 MDV should be avoided for at least the first six weeks of age.

Methods for Detecting REV as a contaminant in live-virus poultry vaccines

Our team demonstrated the usefulness of the PCR reaction in the detection of REV infection and tumors. We demonstrated for the first time an outbreak of REV-induced lymphoma in commercial chickens and established that the source of infection was an REV-contaminated commercial fowlpox vaccine. We evaluated in vitro and in vivo assays for detection of REV as a contaminant in live virus vaccines of poultry and established that in vivo assays should include a test for the virus because negative antibody tests may be misleading. We also collaborated with Dr. Maricarmen Garcia of the University of Georgia, and demonstrated the occurrence of complete or partial insertion of REV genome in various field and vaccine strains of fowlpox virus. This significant contribution was the basis for recognizing that a commercial fowlpox vaccine manufactured in the US was contaminated with REV, and consequently the recall of the vaccine and compensation of the poultry producers by the manufacturer. Further, this work was the basis for establishing guidelines developed by USDA-APHIS for testing live virus vaccines of poultry for contamination with REV. It was also the basis for the invitation by World Animal Health Organization (OIE) to participate in the New Diagnostic Technology Workshop held in France in 2004.

Immunopathogenesis and control of hemorrhagic enteritis (HE) of turkeys



I collaborated with Dr. Keyvan Nazerian and other team members to demonstrate the important role of the bursa of Fabricius in the development of the manifestation of HE of turkeys. (I am here pictured with one of my team members, Technician Cora Rubitchun.) This research and the interpretation of the results led for the first time to the cultivation of the causative virus of the disease *in vitro*. We also demonstrated for the first time the efficacy and safety of the cell-culture live-virus vaccine against HE of turkeys in both laboratory and field trials. In addition to the elucidation of the pathogenesis of this important adenovirus-induced disease of turkeys, these achievements led to later studies by us and by scientists in universities and industry to develop a cell culture live virus vaccine for the control of the disease. These accomplishments encouraged both US and international vaccine manufacturers to apply for a license to produce the vaccine; five US vaccine manufacturers were granted a royalty bearing patent license.

Immunopathogenesis, diagnosis and control of subgroup J avian leukosis virus (ALV-J), a newly recognized ALV infection in broiler breeder flocks in the US

We isolated and characterized a strain named ADOL-Hc-1, the US prototype strain of ALV-J. Following this original demonstration of ALV-J infection for the first time in broiler breeder flocks in the US, our research effort was immediately augmented by grants received from broiler breeder companies, vaccine manufacturers, and USDA-ARS. A comprehensive research program was initiated and aimed at improving diagnosis and control of ALV-J infection. Our team developed a polymerase chain reaction test (PCR) and an ELISA antibody test specific for the detection of ALV-J; we also conducted and collaborated on studies dealing with immunopathogenesis and epidemiology of the disease. (In this picture, taken in the early 2000s, I appear with Dr. Natalia Majo, a professor at the College of Veterinary Medicine, University of Barcelona, Spain, who visited us to discuss various issues related to ALV-J.) Our team demonstrated that: 1) the viral strain, dose, and age of birds at infection influence the incidence of neutralizing antibody and virus persistence; 2) the development of neutralizing antibodies did not always lead to viremia free status, and 3) the distribution of viral antigens in various tissues is influenced by the infection profile (status of viremia and antibody). This work demonstrated the presence of ALV-J infection in meat-type chickens in the US and provided new tools for the specific diagnosis of ALV-J infection. Also, the work on role virus dose and strain and age at infection on virus persistence and development of antibody added significantly to the knowledge of immunopathogenesis of ALV-J and was instrumental in helping the broiler breeder industry to control this important virus infection, which in the late 1990s threatened the economic viability of the entire broiler industry.

Recombinant ALVs associated with myeloid leukosis in commercial layers

Our research team isolated and characterized natural recombinant ALVs isolated from the field. Our team was first to isolate such natural recombinant ALVs with an envelope of subgroup B and LTR of subgroup J (ALV-B/J) from a commercial layer flock suffering from myeloid leukosis. However, further characterization of the virus revealed that the envelope belongs to subgroup B. This confirmed that: 1) natural recombination between two subgroups of ALV can occur under field conditions, and 2) a recombinant ALV with LTR of subgroup J was associated with an outbreak of myeloid leukosis in commercial layer flocks. This accomplishment demonstrated to poultry breeders and growers that indeed natural recombination among two different subgroups of ALV can occur under field conditions.

A Year at the Houghton Poultry Research Station in the United Kingdom

In 1985, I was fortunate to be awarded a USDA Agricultural Research Service fellowship to spend a sabbatical year at the Houghton Poultry Research Station (HPRS) in the United Kingdom. During this year, I worked with Drs. Lawrence (Jim) Payne and Fred Davison on studies aimed at the elucidation of the effects of corticosterone and other various stressors on the shedding of ALV in chickens. This sabbatical year had all the elements necessary for effective scientific work. Most importantly, enduring work relationships were established with the team at HPRS.

Awards and Publications

My research program at ADOL during the 39 years that preceded my retirement in 2015 was focused on diagnosis, immunopathogenesis, epidemiology, and control of two groups of avian retroviruses, avian leucosis, and reticuloendotheliosis viruses. The outcome of my research activities was 221 publications, including 140 peer-reviewed journals articles, 2 patents, 22 book chapters, and 57 conference proceedings. I was fortunate to receive several awards for scientific contributions to the understanding of avian retrovirus induced diseases, including two best paper awards in the international journal *Avian Diseases*, the Upjohn Achievement Award given by the American Association of Avian Pathologists (AAAP) for distinguished contributions to Avian Medicine, and the Excellence in Poultry Research Award given by the American Veterinary Medical Foundation and sponsored by Pfizer Animal Health. Recently, I was inducted into the World Veterinary Poultry Association's Hall of Honor (2015) and AAAP Hall of Honor (2017). I was also elected as Diplomate of the American College of Poultry Veterinarians in 1994 and served as an Associate Editor of the 11th (2003) and 12th (2008) editions of the textbook *Diseases of Poultry*. I also served on the AAAP Tumor Virus Committee and on the editorial board of the journal *Avian Diseases*.

As an Adjunct Clinical Professor in the Department of Pathobiology and Diagnostic Investigation at Michigan State University, I served as the major research advisor for three MS students, five PhD students, and two postdoctoral research associates. I also served as an expert consultant to the United Nations' International Atomic Energy Agency and Food and Agriculture Organization, as well as the United States Agency for International Development and World Organization for Animal Health (OIE).

Travels

I was fortunate to have received numerous invitations to give keynote presentations in eighteen countries including the United States, Australia, Brazil, Canada, China, Cyprus, Egypt, England, France, Germany, Italy, Mexico, Morocco, The Netherlands, Peru, Russia, Spain, and Turkey. These presentations were addressed to regional, national, and international professional associations; industry; commodity groups; academia; and governments on issues related to the understanding of avian retrovirus induced diseases.

Top left, with Drs. Oscar Fletcher and Isabel Gimeno and Randa Fadly; bottom left with Drs. Bruce Calnek, Julius Fabricant, and Louis van der Heide. Right, at UN IAEA in Vienna with one of the trainees.

Top left, with Dr. Lucy Lee, Sylvia Sharma, and Randa Fadly. Bottom left, with Drs. Mo Saif and M. Hafez. Top right, with Drs. Toni Zanella (from Italy) and Nick Dren (from Hungary). Bottom right, with Drs. Richard Witter, Mo Saif, and Linda Saif.

With Drs. Mo Saif and M. Hafez, Denver, Colorado.

Family Life and Retirement

During my entire career, I have always valued my family life and was always grateful for the continued support I received over the years. Because of my family's influence on my career, I chose to include this separate section with a few pictures to document an important part of my biography. I am happily married to my wife Randa. I have four children (pictured on the right): Sherief (law enforcement officer), Angie (attorney), Suzanne (clinical pharmacist), and Adam (attorney). I'm also blessed to have eight grandchildren, four boys and four girls (pictured below).

Since my retirement on September 3, 2015, I have been invited to give talks on various aspects of avian tumor viruses at scientific meetings held in China, Germany, and Egypt. I am truly enjoying my retirement, particularly time spent with my wife, children, and grandchildren. I also enjoy various activities, including swimming, walking, watching movies, and leisure travel.

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Biography solicited by the Committee on the History of Avian Medicine, American Association of Avian Pathologists.
Additional biographical materials may be available from the AAAP Historical Archives located at Iowa State University. Contact information is as follows:
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