

**The 2016 U.S. AAALAC International Fellowship:
A Life-Learning Experience Beyond all Measures**

By Bob Dauchy, MS, CMAR, RLATG

The 2016 AAALAC International Fellowship was one of the most profound experiences in my life. Having worn two 'hats' over the past 40 years in both the laboratory animal science (AALAS) and cancer research fields, the opportunity to travel abroad in the UK and visit outstanding laboratory animal facilities and world-renowned biomedical research and academic institutions was, simply put, the experience of a lifetime. Perhaps the most important part of this experience, was the opportunity this Fellowship afforded me to forge new friendships and collaborations, beginning with that of my 2016 Fellowship co-recipient, Mrs. Donna Goldsteen, an outstanding human being and remarkably accomplished LAS facility manager. Donna's brilliant mind and keen sense of direction (and unending patience with me!) ensured that we were never once late for a scheduled appointment, as we visited facilities and institutions in and around London, Salisbury, and Cambridge. We were warmly received at each location and met with great enthusiasm and a willingness to discuss and exchange ideas on a variety of topics including facility operations, laboratory animal care and management, training, and animal welfare regulations. Through extensive tours and conversations with staff at all levels we developed a better insight into facility operations, animal welfare, research, and public outreach in the UK. This grand experience culminated in our attendance at the IAT Congress in northern England during the final week of the Fellowship.

My flight arrived at London Heathrow early Sunday morning, the sunny last day of February. While descending, famous landmarks like the London Eye, the British Parliament, Westminster Abbey, and the River Thames provided a warm welcome to this eager traveler from the US looking forward to the incredible experience ahead.

After arriving at my hotel in downtown London I met up with Donna for a brief lunch, where we discussed our respective backgrounds and the next two weeks' itinerary. We had previously known each other distantly through our involvement and committee work with AALAS over the past many years, but it became immediately clear to me how remarkable and gifted this person is. After lunch, time was dedicated to exploring local sites, including King's Cross railway station and St. Pancras ("The Tube" – underground subway). Travel routes were mapped out to the various facilities and venues while tickets and passes (Oyster Pass) were purchased. Although a Sunday, and now somewhat chilly, London was teeming with commerce, travelers, and tourists - beautiful in every way.

The second day of the Fellowship began with an underground trip, via the Tube on the Northern Line, to Clare Hall Biological Research Facility in Mill Hill. Clare Hall currently functions as a part of the Medical Research Council (MRC) National Institute for Medical Research (NIMR). Our host kindly ushered us through the tight security where we were given a warm welcome followed by an introduction to the NIMR facility. The focus of the NIMR is on genetics and development, neuroscience, infectious disease, and structural biology. The facility is largely supported by the MRC, which is the national organization funded by taxpayer contributions that provide dedicated research for improvement of public health. This facility will soon transition to the new Francis Crick Institute (FCI) in downtown London. Following a shower, change of garments, and passage into the barrier facility, the world of animal rooms, IVC's, handlers and maintenance was very familiar. It was a great pleasure shadowing the facility manager and staff members while touring the procedural services section, SPF Transgenic Facility, and re-derivation facility. What struck me most was the extreme care and dedication of the staff, and their passion for the work at hand. Currently the emphasis is on re-derivation of all available transgenic lines supported at the NIMR for transfer to the FCI later this year. Although not a massive facility, the superb operational organization and attention to detail was

ever present, features that reminded me of many well-run facilities in the U.S. visited in times past.

That afternoon we returned to downtown London with our tour guide and first visited the Wellcome Trust Charitable Institute (WTCl) on Euston Street. Over a brief lunch at the Institute he described how the biomedical research charity, founded in 1936 by the pharmaceutical magnate Sir Henry Wellcome, is one of the largest contributors globally in the support of research to improve both human and animal health. The conversation then transitioned to WTCl involvement with work on the new, nearly completed FCI Facility, due to open in July 2016. Upon completion, the FCI, comprised of the Medical Research (MRC), and the Cancer Research of UK (CRUK), the Wellcome Trust, University College London (UCL), Imperial College London, and King's College London, will employ over 1500 staff, including over 1250 biomedical research scientists. Following this briefing we made our way on foot from the WTCl to the Crick Institute Facility a short distance away where our host and the site engineer took us on a 2½-hour tour of the massive downtown facility. When completed the FCI will be one of the most technologically advanced biomedical research operations in the world dedicated to the understanding of scientific mechanisms of life. The FCI is very interested in obtaining AAALAC certification so our visit held special meaning for both our host and site engineer. As such, we were able to make several suggestions to include considerations for work flow, ceiling/wall design, equipment and material storage – all of great interest and warmly received. All in all, the FCI building, including laboratory animal facilities, is one of the most magnificent facilities this traveler has ever toured – a proud tribute to the people of the UK and the field of biomedical research.

At the conclusion of the FCI tour, we made a return visit to WTCl to interview two of our host's superiors, who are currently involved in the transition of all personnel and operations to the new FCI facility. Following our discussion we all made a short walk up the street to the headquarters of the National Center for

Replacement, Refinement, and Reduction of Animals in Research (NC3Rs). The London-based NC3Rs, founded in 2004 and rapidly gaining a global presence with the advent of the ARRIVE Guidelines, is dedicated to developing alternative approaches in scientific research, which seeks to avoid the use of animals but also closely reflect human biology. Here we attended the 2016 annual meeting of the NC3Rs organization along with about 200 other guests and members. The meeting concluded with the awards ceremony for the 2016 grant recipient project winners and was an exceptionally exciting event for all.

Following the day's events our host kindly walked us to Euston Station where we bid fair well and caught the Tube to King's Cross. We then departed London and traveled southwest by rail two hours to Grateley Station in Salisbury. On my first English train ride I had the good fortune to sit next to a gentleman returning home that eve from a museum visit in London earlier that day. As it turns out, he is a retired British engineer who lived for several years in a town nearby where I grew up in the US and where I met my wife. We had the most engaging conversation. He had also traveled to many locations throughout the US that I had lived or visited at one time or another, including New Orleans where my wife and I currently reside. What a small world! Our interesting conversation sure made the train ride all too brief. When we arrived at Grateley Station we were met by our cab driver, who drove us the 8 kilometers (5 miles) into the quaint town of Amesbury for an overnight stay at the wonderful Fairview Guest House. What a remarkable day!

On the third day of the tour, we visited the Centre for Macaques (CFM) in Porton Down (near Stonehenge), a major breeding facility for rhesus macaques studied in academic research in the UK. At the CFM the emphasis is on training to ensure that all animals are well socialized with humans. The staff was an exceptionally tight-knit team of folks, very passionate about their work and the animals they care for. One of the most unique features of this well-run facility, aside from the myriad of enrichment items, were the moveable mirrors that

allowed the Macaques added visibility up and down the corridors. At noon our hosts provided us with an excellent lunch and we were able to, in turn, describe our facilities and operations back in the US. It was a pleasure to present some of our work on the impact of environmental light at night on human and animal health and wellbeing to this very interested audience, and a lively Q&A session followed. Following the daylong visit we were dropped off at Grateley Station where we caught the return train to King's Cross London. After the hotel check-in we managed another excellent dinner at a nearby Italian restaurant – a fitting end to another exciting day!

Day four began early with a ride in the Tube from Euston Station to London Bridge Station and a visit to Kings College. Here we first met with our gracious host, the Director of Biological Services Unit, who provided us with a brief overview of the laboratory animal operations of his facility. He then introduced us to the staff of the zebrafish facility where we were provided a 2-hour tour. The zebrafish facility, housing over 2,000 aquaria in a state-of-the arts facility, is currently one of the largest of its kind in the country. Again, we were most impressed by the use of modern technology in the care and handling of this new and emerging species in research, and the profound passion and dedication of the staff. The day concluded with a visit to Understanding Animal Research (UAR), a remarkable organization founded in 2008 and dedicated to the understanding and acceptance for humane animal research. The organization consists of members of the public, media, policy makers, educators, and scientists. The UAR seeks to educate society on the importance of animal research based on factual historic and scientific information. What began initially as a brief visit to the UAR resulted in a memorable dialogue and exchange of growth and development ideas between us and the staff that lasted several hours throughout the remainder of the afternoon.

On the morning of day 5 we took the train from London to Cambridge on the northern line, and what a beautiful day it was! I must say that our train travels

have been excellent, on time, and most scenic. Cambridge is renowned as one of England's two great university towns, and one of the most beautiful locations. When we arrived at the Cambridge train station on Thursday morning we caught a cab and headed out to the Medical Research Council Laboratory for Molecular Biology (LMB) Ares Building on the Babraham Research Campus (BRC) to meet up with our host. The morning was stunningly beautiful and a bit warmer. When we arrived at the LMB he was waiting for us with open arms and a genuinely warm smile! He took our bags from the taxi and led us into the facility. The famed LMB was originally founded in 1947 and has been home to over 30 Nobel Prize winners, including James Watson, Francis Crick and Frederick Sanger. Our initial tour at the BRC focused on the transgenic technology group that provides DNA and ES cell microinjection service to the scientific community. After coffee/tea and biscuits we had a brief discussion of the LMB operations then, following clothing change, provided a complete tour of the facilities. My co-Fellow, Donna, was quite excited because the MedImmune facility (and a number of her dear colleagues) was located about 100 ft across from the Ares building! We were next taken over to the MedImmune building where she was able to meet up with some colleagues for a brief talk, prior to our departure.

Following the morning tour, we checked our bags into our hotel and were then delivered to our host at the new facilities of the MRC-LMB on Francis Crick Avenue, just across the street from the new Astra-Zeneca Cambridge headquarters, currently under construction. This new showcase laboratory facility was opened in 2013 on the now extended campus was renamed as the Cambridge Biomedical Campus. Our host took us to an outstanding lunch in the new facility, and we had great conversation as we got to know each other better. This was followed by a full tour the remarkable MRC-LMB facility. After the tour I had an interview with Michael (Mick) Hastings (suprachiasmatic nuclei expert, right down our alley!!) regarding our work. The interview, previously scheduled for 45 min, lasted nearly 1½ hours, as he was quite excited about our work in the area of light at night (LAN), the blue cage studies, and our more recent work in

the area of LED lighting. As it turned out both of us are members of the Society for Biological Rhythms and had attended several of the same circadian rhythm and FASEB meetings in years past. For me, this was certainly a highlight in this wonderful Fellowship visit – it's a science/researcher thing!

Following the visit to the MRC-LMB facilities, our hosts gave us a tour of the town of Cambridge. First we drove around a bit, and then spent the remaining part of the afternoon walking around the inner section of this beautiful town with a population of about 100,000. The building architecture, including university buildings, museums, and churches, is nothing short of magnificent – all of which made for a wonderful walking tour for us all. As evening approached we had dinner at the Eagle Pub where Watson and Crick announced their finding of DNA on February 28, 1953 – almost 63 years ago to the day. After an exceptional day and fantastic evening at the Eagle Pub our hosts dropped us off at the hotel.

We began day six of our Fellowship by visiting the Department of Physiology, Neuroscience & Development at Cambridge University. Our host provided us with an outstanding overview of the work conducted at the university followed by tours at both the Veterinary College and the NWP breeding and research facility. Following an outstanding lunch at a local restaurant (and my first Guinness beer!) we ended the day by touring the Avian Facility. Again, the passion and enthusiasm of all the technicians and laboratory animal personnel was simply amazing. Their willingness to interact and engage in meaningful discussions regarding their work was a highlight of the day – along with my first encounter with the beautiful marmosets at the Veterinary College, of course! What an experience! The day ended with a return to our hotel in downtown Cambridge and a real feast at Jamie Oliver's outstanding restaurant.

The next two days (weekend) were spent taking in some sites in and around Cambridge. Although the weather turned somewhat cold and rainy this did not deter us from taking an exciting "Hop On, Hop Off" bus tour of the town and also

walking/exploring a good deal of the time. Over the course of two days we spent many hours visiting such sites as the Fitzwilliam's Museum, Sedgwick Museum of Earth Sciences (Darwin's Collection); Whipple Museum of Science; and, Cambridge Museum of Zoology. We also had the wonderful experience of visiting the original Cavendish Laboratories and several other historic sites around the town. And each day concluded with an outstanding meal (and an excellent glass of wine!) at a new restaurant nearby the hotel.

Day 9 began for us with a long-awaited trip to the famous Wellcome Trust Sanger Institute, founded in 1993. Some of the most important advances in genomic research have occurred here. The Institute is divided into essentially five parts to include human genetics, pathogen genetics, mouse and zebrafish genetics, cell systems genetics, and bioinformatics. The Research Support Facility is a state of the art animal facility that includes rodents, zebrafish and frogs, but also includes a transgenic technologies group that provides worldwide DNA and ES cell microinjection and mouse cryopreservation services. Our host led us on an extended tour of this outstanding research institute, which included an introduction to the staff of the transgenic technology group, where we were provided a detailed description of all activities. We were most impressed with the efforts ongoing. The facility's dedicated and skilled technicians are absolutely amazing, and their passion for the work is admirable in every sense, and especially the folks in the research support facility as well as those who oversee the remarkable Sanger Institute mouse database system.

During week two of the Fellowship attended the 2016 Institute for Animal Technology (IAT) Congress held this year in northern England. The theme of this year's Congress was "Animal Technology – compassion, education, dedication." With over 400 delegates in attendance, the IAT Congress, albeit smaller in size compared to the AALAS National Meeting in the U.S., did not disappoint in terms of scope and diversity of topics that included laboratory investigations, husbandry and care, animal welfare regulations, and management, and was uniquely similar

to that of the AALAS NM. All too evident was a similar audience participation and enthusiasm for the work. And much like the AALAS NM, the IAT Congress had outstanding vendor participation and support, including from the US and central Europe. Some workshops were conducted twice at different time slots to allow for more participation. During the course of the IAT Congress, Donna presented her work entitled, *Effect of Nesting Material on Aggression in Diet-induced Obese C57BL/6 Male Mice*. Her work investigated a strategy that might be applied to eliminate conspecific aggression in this strain of mouse. On the final day, I was honored to present the Kevin P. Dolan Memorial Lecture entitled, *The Influence of Light on Human and Laboratory Animal Health and Wellbeing*. The presentation focused on the underlying mechanisms associated with animal facility light-at-night (LAN) exposure and human tumor growth, daytime blue-enriched LED lighting, and improving animal facility design and lighting protocols leading to enhanced animal health and wellbeing. This remarkable conference concluded with the beautiful Gala evening, complete with outstanding food, conversation, music and dancing, and not to forget, the immensely popular “Ken’s Quiz Night” - truly an evening to remember forever!

Obvious to us both, and a topic of several conversations during the Fellowship, is the increased attention to detail and emphasis in the UK at all levels regarding animal welfare regulations, animal care, and following proper protocols. Much of this added emphasis in the UK, as compared to other countries, resulting in large part from an increased response at both institutional and governmental levels to the animal rights movement (“anti’s”) beginning in the 1980s and ‘90s. It is also clear that the primary governmental (Home Office) laboratory animal regulatory department, the Animals in Science Regulation Unit (ASRU), plays an enhanced oversight role in laboratory animal use.

We came to meet and interact with many dedicated and hard-working folks at all levels in the laboratory animal science field. These remarkable people are the gatekeepers dedicated to the humane care and treatment of laboratory animals,

as well as the quality research leading to scientific gains that benefit humans and animals. At all times, one could not help but feel a 'common kindred' for the work, passion and dedication exemplified here in the UK, as in the US.

There is no question that the AAALAC Fellowship has been a remarkable event for both Donna and myself. The experiences gained and friendships forged during the Fellowship have been phenomenal and life-memorable. I, for one, shall continue to share these experiences and the knowledge gained with my associates both inside and outside the workplace, on the local, national, and international levels. It's my hope that in this manner I can help to improve animal welfare and refinement and to grow forward the fields of biomedical research and laboratory animal science. My heartfelt thanks go out to my dear friends and colleagues who have stood by my side and have helped me tirelessly over so many years, especially Mrs. Cynthia Kloster, who nominated me for this prestigious award; and, to Ms. Lynell Dupepe, Dr. David Blask, and Dr. Leonard Sauer, who provided letters of support. And very special thanks to Priority One Services, Inc., for the generous grant they provide, and to AAALAC, AALAS, IAT, MRC, NIH, and to all the remarkable persons involved with this outstanding program for making this my experience of a lifetime – beyond all measures!