

# Fundamentals of Veterinary Science Summer School

2011



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University of Cambridge

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Front cover:  
Ovine PrP transgenic (red-eyed) and  
non-transgenic (white-eyed) *Drosophila*



Cambridge Veterinary School



Punts on the River Cam

Fitzwilliam Museum



## Veterinary science and its importance

What is Veterinary Science?

What is the importance of Veterinary Science?

What careers are there in Veterinary Science?

Without thinking of these questions and experiencing research for yourself, can you as a veterinarian discard veterinary science as a possible career?

Now is your chance as a clinical veterinary student to explore science and its importance to the veterinary profession and wider community: e.g. farming, trade, public health, pharmaceutical industry, human and comparative medicine and veterinary clinical practice.

Over the last ten years Cambridge University has developed a Summer School to foster veterinary science skills and examine careers for veterinary scientists. The School offers the opportunity to:

- perform a short laboratory-based research project
- consider careers in veterinary science
- explore important veterinary problems
- discuss topics with experts in the field
- develop skills in - problem-solving; teamwork and communication

Whether you eventually take a research path or go into clinical practice, the Summer School aims to remind you that in veterinary medicine you should question fact and practices so that the profession may move forward and improve. Come and join us for a unique research experience at Cambridge University and have an exciting, enlightening and fun-filled summer.



Left: Double helix sculpture at Clare College.  
Above: The Eagle pub where Watson and Crick discussed their theories on DNA



Dr. Raymond Bujdoso, Director

## Structure of the Summer School

The Fundamentals of Veterinary Science is a nine-week residential school for clinical veterinary students or new veterinary graduates. Participants are selected from the world-wide veterinary community and are paid an honorarium and travel costs. In addition, accommodation is arranged and paid for by the School. Students are housed together in Wolfson College with their own rooms and a shared kitchen.

The academic programme consists of workshops and seminars with themes as set out later in this brochure, as well as a research project in one of Cambridge University's leading laboratories.

The workshops give participants the chance to review areas of interest with help from world authorities in the field, and to practice presentation and discussion skills. Working sometimes singly and sometimes in teams, participants are asked to prepare and present information on a single aspect of the topic. A group of these presentations is used to stimulate discussion and debates in which the expert faculty are briefed to both provoke and inform.

The project allows participants to experience research 'in the raw': to plan day-to-day experiments, problem solve if results are not as expected, interpret data and draw conclusions from their results to allow planning of future work.

A number of social events are organised by the Summer School including a punt trip and formal College dinner, but we hope that you will develop a real group spirit and enjoy your summer working and socialising together. A great deal of the success of the School derives from the interaction of students with a variety of nationalities and educational backgrounds.

## The 2010 Summer School

This took place from 20th June to 21st August. Fifteen students participated representing veterinary schools in Australia, Austria, Brazil, Germany, Hungary, Italy, Poland, Spain, United Kingdom and the USA. In 2011 we shall run from 19th June to 20th August.



Enjoying time in the laboratory

'Nice working atmosphere, complimentary seminars, great learning, great fun'



Students preparing course work

'Interesting to learn that we have more opportunities than clinical practice'

'Independent thinking and discussion, we were asked our opinion'

Punting with new friends





Dr. Mark Holmes discussing 'evidence'

'Extremely informative, great discussion, lots of guidance and encouragement provided'



Professor Jonathan Heeney discussing the emergence of zoonotic diseases

'Interesting, dynamic and fun'

Professor Josh Slater asking for opinions



## Workshop Sessions

### Science Topics in depth

Epidemiology of Foot and Mouth Disease and Bovine Tuberculosis

Influenza

The contribution of veterinary scientists to exciting, major and intractable problems in disease control is immense. Here we examine headline problems of huge economic importance to world and UK agriculture as well as threats to human health. Students prepare for short presentations on questions within the topic. This allows focused discussion on particular areas throughout the session with direction from expert world leaders in each field. (Discussions are often continued in the pub or restaurant afterwards). In 2010 these sessions were on influenza virus, the UK foot and mouth disease epidemic and the spread of bovine tuberculosis in the UK.

In 2011 science topics will explore similar themes; looking at infectious diseases that are a global threat to agriculture and human health. These will study aspects of therapy, vaccination and other control measures that are important in reducing the threat from epidemic disease.



Dr. Richard Clifton-Hadley, Katrina Karolemeas and Professor James Wood mediating discussion on the epidemiology of bovine TB

### Special Seminars

Short seminars are given by Summer School faculty members to illustrate particular areas of thought in science, either in taking basic scientific research and applying it to the clinic or in specific problems in agricultural disease. For example Dr. Mark Holmes challenged our preconceived notions of what is evidence and therefore fact; Dr. Kristian Franz gave an enlightening seminar on nanoscience in neuroscience; Dr. Olivier Andreatti gave an exciting and stimulating update on prion diseases.

## Ethics

This interactive session explains how ethical issues can be analysed and applied to real welfare situations. Groups are then given specific problems to analyse and to decide on a solution which they present. Group discussions allow widening of each topic and other evaluations and alternative solutions to be considered.

## Career Orientation

Guided discussions are used to examine potential career paths in veterinary science. Facilitators include scientists with recent knowledge of the current system, veterinarians whose career paths have included basic research, full time agricultural or veterinary research, and mixed clinical/research careers in both the private and public sectors.

We consider the structure of non-clinical veterinary careers and evaluate the challenges that you may face. There is consideration of the assessment of the quality of scientific problems, and also the practicalities of performing first class clinical research. Further discussion centres around science career paths and looks at the order of training, the structure of specialist careers, such as those in pathology or genetics, as well as at the wider value of a veterinary degree combined with a research degree.



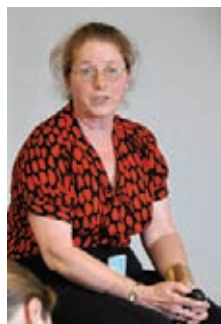
Dr. Ian Brown and Dr. Laurence Tiley leading a discussion on influenza virus

'Stimulating and interactive'



Dr. Kristian Franz highlighted the role of nanoscience in neuroscience

'Careers sessions made the Summer School priceless'



Careers session speakers (clockwise from top left)  
Dr. Anne-Marie Farmer  
Mrs Amita Shortland  
Dr. Camilla Benfield  
Miss Jo Keeley  
Dr. Stephen Ryder



Linda McPhee leading the scientific writing session

## Structure of Scientific Papers

Research papers are often difficult to understand. This does not necessarily reflect the scientific content or the ability of the reader, but the way in which they have been written. Mrs Linda McPhee, a consultant in research-based writing, guides students through the theory of structuring scientific papers.



## Meeting Cambridge's Veterinary Scientists

Sessions with members of the Cambridge University Vet School Faculty explore particular research topics and also the special challenges encountered in veterinary and clinical research. These sessions range from formal research talks to broad ranging biographies, and from carefully argued consideration of the nature and power of different types of clinical study to informal 'what would you like to know?' meetings.

### Field Trip

A field trip to a world class research institute is combined with a discussion of its work. In 2010 we visited the GlaxoSmithKline research and development site at Ware, UK. We first heard an overview of the R&D process and then the role of the veterinary pathologist in drug development. This was followed by a tour of some of the facilities and explanations of the current projects on site. There was the opportunity to have informal discussions with vets and other staff working in the Ware facilities over a buffet lunch.



Dr. James Yeates discussing ethical issues



Jennifer Moffet explaining how to interact effectively with the media



Dr. Olivier Andreoletti giving an update on prion diseases

## Applications and Enquiries

Enquiries about the Fundamentals of Veterinary Science Summer School 2011 should be directed to Dr. Raymond Bujdoso, Director of the Summer School at [summer.school@vet.cam.ac.uk](mailto:summer.school@vet.cam.ac.uk). You will be selected for the Summer School on the basis of past academic record and a short personal statement (400 - 500 words) describing your motivation for participating in the school. You may come from anywhere in the world providing your veterinary and general education equips you to benefit from the course. You should be in the clinical years of veterinary training or within 3 years of graduation from a veterinary course. A fluent command of English is essential (we may ask for proof of proficiency). Applications can be made on the form overleaf, but if you prefer, an electronic copy can be downloaded from our website at <http://www.vet.cam.ac.uk/summerschool/>. Please be sure to state which areas of veterinary and basic science particularly interest you and why. You must provide an academic reference with your application. We accept applications either by post or email at the address indicated on the form, however your academic reference must come under separate cover. Entry to the Summer School is competitive.

**The closing date for applications is Friday 18th February 2011.**

FUNDAMENTALS OF VETERINARY SCIENCE SUMMER SCHOOL

19<sup>TH</sup> JUNE - 20<sup>TH</sup> AUGUST 2011

**APPLICATION FORM**

The closing date for applications is 18th February 2011

Return to: Dr. Raymond Bujdoso, Director of Veterinary Science Summer School  
Department of Veterinary Medicine, University of Cambridge  
Maddingley Road, CAMBRIDGE, CB3 0ES, U.K.  
Fax: +44 (0)1223 337610  
Email: summer.school@vet.cam.ac.uk

Your full name:

Term address and telephone number:

Home address and telephone number:

Email: Male/Female

Date of Birth: Nationality:

Study University: Year of Study:

Academic record (including any previous degrees with grades; also prizes, merits etc):

Name and Address of Academic Referee (e.g. Study Advisor):

Areas of Particular Interest (this helps us to allocate project choices):

Previous Laboratory experience: Yes/No

If Yes, give brief details (including length of time in lab, was work independent?):

Statement of Motivation for attending this Summer School (not more than 500 words, use extra sheet if necessary):

## REFEREE'S STATEMENT

IN SUPPORT OF AN APPLICATION TO THE  
FUNDAMENTALS OF VETERINARY SCIENCE SUMMER SCHOOL 2011

CLOSING DATE 18<sup>TH</sup> FEBRUARY 2011

(To be completed by the referee)

Name of Student:

This student is applying to the Fundamentals of Veterinary Science Summer School at the University of Cambridge. The School will foster veterinary science skills, look in detail at particular current problems, and examine aspects of research and other alternate career paths for the veterinary graduate. Please give your opinion of the suitability of the student to attend this school, commenting both on their academic ability, their interests and their communication and social skills (and on anything else you think will aid in selecting the right students for the school).

Return to: Dr. Raymond Bujdoso, Director of Veterinary Science Summer School  
Department of Veterinary Medicine, University of Cambridge  
Maddingley Road, CAMBRIDGE, CB3 0ES, U.K.  
Fax: +44 (0)1223 337610  
Email: [summer.school@vet.cam.ac.uk](mailto:summer.school@vet.cam.ac.uk)

REFEREE'S TITLE, NAME, CONTACT INFORMATION:

IN WHAT CAPACITY DO YOU KNOW THE STUDENT:

STATEMENT (use extra sheet if necessary):

## Research Projects

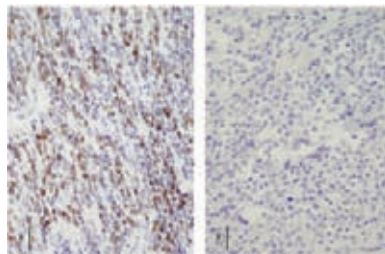
Projects consist of 8 weeks of laboratory or field work at high intensity but leaving time for other activities of the Summer School. Some of the research projects take place within the Cambridge Veterinary School, with others hosted by different Cambridge University Departments and Institutes within the Faculty of Biology and the School of Clinical (human) Medicine. Topics range from clinical to basic science.

Projects are assigned to each participant with reference to their expressed interests, however we cannot guarantee project selections. Participants present a short report on their work, both in a seminar and a written report at the end of the Summer School.

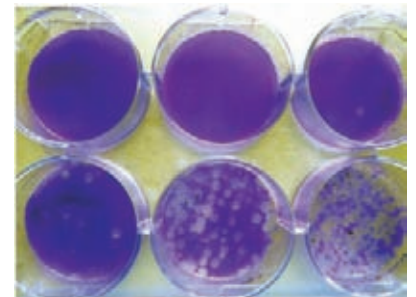
A selection of projects and results:



Daniel identified equine influenza virus mutants



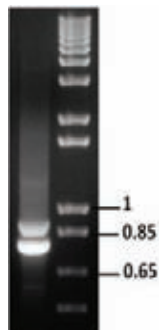
Simon characterised mast cell tumours in dogs



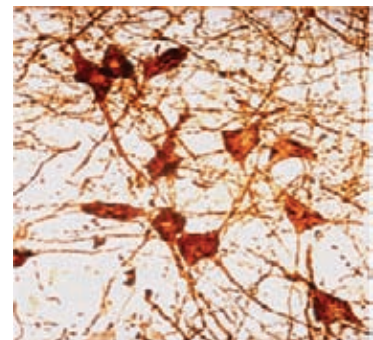
Lauren compared RNA interference strategies against influenza virus



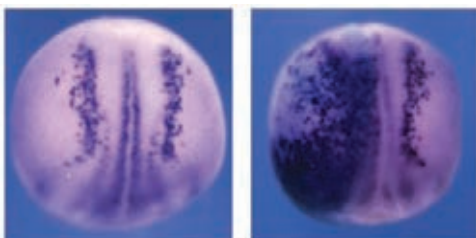
Inga investigated virulence in *Erwinia carotovora*



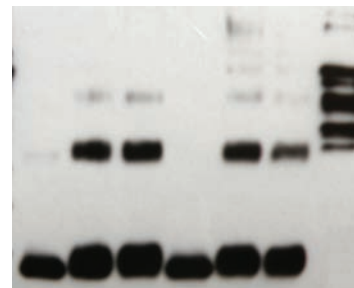
Seema cloned and sequenced canine carbonic anhydrase II



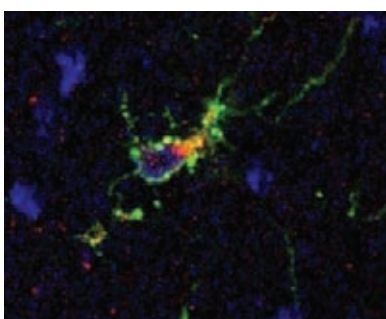
Adrian characterised dopaminergic cell density in the substantia nigra of a transgenic mouse model of Parkinson's disease



Andréia analysed phosphorylation of neurogenin in *Xenopus* oocytes



Jarek studied disulphide-mediated human TLR4 TIR dimerisation



Jane investigated the axon population in normal and remyelinated rat caudal cerebellar peduncle

Jana analysed the genetic regulation of gas vesicle production in *Serratia*



# Participants, Supervisors and Projects 2010

Simon Andersson Szent Istvan University Budapest, Hungary	Supervisor: Dr. Fernando Constantino-Casas, Dept of Veterinary Medicine Minichromosome maintenance protein 3 expression in mast cell tumours in dogs
Marianne Bradshaw University of Bristol, UK	Supervisor: Prof. Jim Kaufman, Dept of Pathology Identity in a sea of variability: does chicken BLA substitute for mammalian MHC class II A chains in structure and function?
Lauren Demos Murdoch University, Australia	Supervisor: Dr. Laurence Tiley, Dept of Veterinary Medicine Investigating the consequences of virus propagation in genetically modified influenza resistant chicken cells
Robyn Ellerbrock Cornell University Ithaca, USA	Supervisor: Dr. T.J. McKinley, Dept of Veterinary Medicine Exploring biases in GB national bovine tuberculosis datasets
Jarek Galadyk Warsaw University of Life Sciences, Poland	Supervisor: Dr. Tom Monie, Dept of Biochemistry Unlocking the response of TLRs to pathogens-what does the BB loop do?
Lisa Grassato University of Bologna, Italy	Supervisor: Prof. Nicola Clayton, Dept of Experimental Psychology Social intelligence: the effect of experience on behavioural synchronization in rooks
Megan Lee-Müller University of Veterinary Medicine, Vienna, Austria	Supervisor: Dr. Raymond Bujdoso, Dept of Veterinary Medicine The use of <i>Drosophila</i> to model ovine prion disease
Seema Kooblall University of Nottingham, UK	Supervisor: Dr. Laurence Tiley, Dept of Veterinary Medicine Development of a canine anti-carbonic anhydrase ELISA
Jana Liesner TiHo University of Hannover, Germany	Supervisor: Prof. George Salmond, Dept of Biochemistry The genetic regulation of gas vesicle production in <i>Serratia</i> 39006
Daniel Thomas López University of Madrid, Spain	Supervisor: Dr. Pablo Murcia, Dept of Veterinary Medicine How fit do you think your influenza virus variant is?
Adrian Lührs TiHo University of Hannover, Germany	Supervisor: Prof. Maria Grazia Spillantini, Dept of Clinical Neurosciences Relationship of alpha-synuclein expression and dopaminergic cell death
Jane Na Michigan State University, USA	Supervisor: Dr. Ragnhildur Thora Karadottir, Dept of Veterinary Medicine Role of white matter neurotransmission in disease
Emily Neagle University of Queensland, Australia	Supervisor: Dr. David Sargan, Dept of Veterinary Medicine Use of anti-peptidyl RPGRIP1 antibodies to demonstrate expression of RPGRIP1 protein in CORD-1 mutant eyes
Inga Quester TiHo University of Hannover, Germany	Supervisor: Prof. George Salmond, Dept of Biochemistry Investigating new regulation inputs to virulence in the bacterial pathogen <i>Erwinia</i>
Andréia Turchetti Universidade Federal de Minas Gerais, Brazil	Supervisor: Dr. Anna Philpott, Dept of Oncology Post-translational regulation of proneural proteins

# The Summer School Faculty 2010

Careers I  
Facilitators: What the Vet Brings to Science  
Prof. Josh Slater, Professor of Equine Studies, Royal Veterinary College, London  
Dr. David Sargan, Senior Lecturer in Molecular Pathology, Dept of Veterinary Medicine and Director, Graduate School of Life Sciences, University of Cambridge

Careers II  
Facilitators: Minifair - Careers Beyond Clinical Veterinary Practice  
Dr. Anne-Marie Farmer, Home Office; Dr. Stephen Ryder, Home Office;  
Dr. Camilla Benfield, Post Doctoral Scientist; Mrs Amita Shortland, PhD Student  
Miss Jo Keeley, UBSS, University of Cambridge

Ethics of Animal Treatment and Use  
Facilitator: Dr. James Yeates, Animal Welfare and Behaviour Group, University of Bristol

Influenza  
Facilitators: Dr. Laurence Tiley, Senior Lecturer in Molecular Virology, Dept of Veterinary Medicine, University of Cambridge; Dr. Ian Brown, Head of Avian Virology, Veterinary Laboratories Agency, Weybridge

Epidemiology of FMD and Bovine TB  
Facilitators: Prof. James Wood, Director of the Cambridge Infectious Diseases Consortium, Professor of Equine and Farm Animal Science, Dept of Veterinary Medicine, University of Cambridge; Dr. Richard Clifton-Hadley, Head of Department, Programme Manager Statutory and Exotic Bacterial Diseases, Veterinary Laboratories Agency, Weybridge; Katrina Karolemeas, PhD Student, Dept of Veterinary Medicine, University of Cambridge

Structure of Scientific Papers  
Facilitator: Mrs Linda McPhee, Consultant in Research-Based Writing

Presentational Skills  
Facilitator: Ms Jennifer Moffet, Director of Communications, Ross University School of Veterinary Medicine, St. Kitts

Special Seminars: The Road Less Travelled: Professor Jonathan Heeney, Professor of Comparative Pathology, Dept of Veterinary Medicine, University of Cambridge  
Philosophy of Science: Dr. Mark Holmes, Senior Lecturer in Preventative Medicine, Dept of Veterinary Medicine, University of Cambridge  
Nanoscience in Neuroscience: Dr. Kristian Franz, Post Doctoral Scientist, Physics of Medicine, University of Cambridge  
Biology of Prion Diseases: Dr. Olivier Andreoletti, Senior Scientist, Interactions Hôtes-Agents Pathogènes, Ecole Nationale Vétérinaire de Toulouse, France.

Tour of the Vet School: Dr. Penny Watson, Senior Lecturer in Clinical Nutrition, Dept of Veterinary Medicine, University of Cambridge

Visit to GlaxoSmithKline, Ware: Hosts, Mr. Deon Hildebrand and Mr. Hugh Edgar



Back row: Simon Inga Emily Adrian Jarek Daniel  
Front row: Seema Lauren Marianne Megan Lisa Robyn Jane Jana Andréia



## Summer School Director: Dr. Raymond Bujdoso

### Local Specialists:

- Ms Kirsty Simmons
- Mrs Judy Smither
- Mrs Sheena Tharakan
- Mrs Lorraine Leonard
- Mr Paul Tonks
- Dr. Jon Lyall

- Secretary
- Computing
- Computing
- Library
- Bikes
- Punting



### Accommodation:

- Wolfson Court, Girton College
- Mrs Maureen Hackett, Warden



Date of 2011 Summer School  
Sunday 19th June to Saturday 20th August 2011

Closing date for applications is Friday  
18th February 2011



### Applications:

See inside of brochure  
or visit <http://www.vet.cam.ac.uk/SummerSchool/>  
or contact [summer.school@vet.cam.ac.uk](mailto:summer.school@vet.cam.ac.uk)  
Information will be on our website from October 2010



*Clockwise from bottom left:  
Having lunch; Adrian discussing results; after the gala dinner; Lauren; Jana in charge; Marianne and Emily; at the Castle Inn; the Castle Inn; Simon, Inga and Jane meet the press; some of the press; Senate House Passage; Daniel; at the Castle Inn; St. John's College and the River Cam; Emily and Seema; post gala dinner discussion; Lisa, Jarek, Andréia and Jana; the Corpus Clock at Corpus Christi College.*

