

CEO REPORT

Dr Stephen Prowse

p2 >>

NEWS

p3 >>

- Liz Williams reports on the international reach of an AB-CRC developed assay for detecting henipaviruses
- AB-CRC fully funded researchers provide critical support during recent Hendra outbreak
- Tony Martin updates developments in his freedom from disease project
- Deb Cousins reports on Jo Edmondston's new role at the University of Western Australia
- Liz Williams reports on an AB-CRC designed novel approach to storing serum in hostile environments
- Liz Williams relays developments for a new molecular test for surra

REPORTS

p7 >>

- Jo Edmondston reports on a second Knowledge into Practice and Policy workshop
- Deb Cousins outlines winners of the AB-CRC's 2009 Knowledge Brokering Awards
- Jo Edmondston relays the success of a recent AB-CRC course on molecular techniques

SHORT COURSES

p10 >>

- Quantitative Risk Analysis for Animal, Plant and Public Health
- AB-CRC Short Course: An Introduction to Epidemiology
- AB-CRC Short Course: An Introduction to GIS

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Click on the articles
to be taken directly
to that page ➔

CEO REPORT

Dr Stephen Prowse, CEO



More disease outbreaks connecting human and animal health

The need for close research and operational links between the livestock health, human health and the wildlife disease sector remains stronger than ever with another Hendra virus outbreak in central Queensland. It has been confirmed that two horses were infected and there is now one human case - a veterinarian who treated one of the infected horses. Unfortunately he is in intensive care in a Brisbane hospital.

The AB-CRC has just completed a summary of the current information about Hendra virus which is available at www.abcrc.org.au/pages/programs.aspx?ProgramID=48. This highlights the extent of known information as well as the information gaps. While there is plenty of speculation, we still do not know precisely how the virus gets from bats to horses.

The human health and animal health linkages are also demonstrated with the infection of a second Australian piggyery with influenza A H1N1 2009. While it is not known for certain if it is the same strain of virus that infects humans, it appears to be highly likely. Hence transmission appears to be from infected humans to pigs.

Closing the AB-CRC

It feels rather strange to be closing the AB-CRC together with its major Hendra virus research program during a Hendra virus outbreak. It also seems unlikely that there will be alternative support for this work but perhaps some alternatives may emerge after this outbreak.

I am working with the AB-CRC Business Manager and the Board to develop and implement the plan to close the AB-CRC while maximising the benefits to partners over the remaining ten months of operation. Much of this activity involves the adoption and uptake of research outcomes as projects come to an end. This will include specific focussed projects as well as forums and workshops.

Freedom from disease

AB-CRC supported work on the processes to demonstrate freedom from disease goes from strength to strength. The system has been used in a number of countries around the world, gaining increased recognition and credibility.

Now the 'freedom team' led by Tony Martin has been invited to be an expert member of the World Organisation for Animal Health team that is preparing a handbook on terrestrial animal health surveillance. Read more about Tony and his team's work in the [NEWS](#) section of this newsletter.

NEWS

AB-CRC henipavirus assay goes international

By Liz Williams, AB-CRC Project Officer

Hendra has hit Australian headlines again with the news of an outbreak at an equine stud in central Queensland this month. Rapid and sensitive diagnosis remains the key to any effective disease outbreak response, and is especially important for diseases of high mortality with no effective treatment, such as Hendra infections.

Through collaboration with scientists in Australia and overseas, a safer, more sensitive and more specific assay for detecting henipaviruses (the family containing both Hendra and Nipha viruses) has been developed by an AB-CRC supported team at CSIRO's Australian Animal Health Laboratory (AAHL) and is being applied to both surveillance studies and outbreak investigations worldwide

In the 2008 Hendra virus outbreaks in Australia, which killed a Brisbane vet, the assay played an important role in the rapid diagnosis of the Hendra virus in humans. It is now routinely used as a diagnostic assay by Queensland Health.

The test, based on Luminex-bead array technology, has also been used internationally, aiding in the discovery of henipavirus infection among West African bats by scientists at Oxford University in collaboration with AB-CRC researchers Andrew Breed, Jennifer McEachern and Linfa Wang¹. The finding is especially important as it is the first time that henipaviruses have been found in non pteropid fruit bats, over 5000km from the nearest pteropid bat colonies.

¹ Hayman DTS, Suu-Ire R, Breed AC, McEachern JA, Wang L, et al. 2008 Evidence of Henipavirus Infection in West African Fruit Bats. *PLoS ONE* 3(7): e2739. doi:10.1371/journal.pone.0002739

The assay is also currently being used for surveillance investigations in Malaysia and China, with more Asian countries showing interest in adopting the technology.

The novel henipavirus antibody detection assay was developed in a previous AB-CRC supported project (www.abcrc.org.au/pages/project.aspx?projectid=78) and is both more sensitive and more specific than conventional ELISA. AB-CRC's Application & Linkage Program funding supported Jennifer McEachern's placement at Dr Christopher Broder's lab in Florida, USA to obtain the necessary training in protein purification required for the assay, and for funding technology transfer to international research teams.

This project has delivered high impact outcomes in many ways and the assay is now internationally recognised as one of the best alternatives to the cumbersome and highly risky serum neutralization test which requires live virus and high containment PC4 facilities.

Read more about Hendra in the recently released AB-CRC synthesis paper at www.abcrc.org.au/pages/programs.aspx?ProgramID=48.

AB-CRC researchers provide real-time research on the ground during latest Australian Hendra outbreak

Researchers fully funded by the AB-CRC provided critical support during the recent Hendra outbreak in central Queensland within hours of the virus' confirmation.

AB-CRC researchers Carol de Jong and Craig Smith played a pivotal role in the Queensland Primary Industries and Fisheries' 'bat research team', facilitating the collection of real-time samples from flying foxes and thereby providing valuable data for Hendra virus research. Within 18 hours of the first horse testing positive to the

virus, Carol was on the road to the outbreak's epicentre, while Craig remained in Brisbane to provide vital logistical support.

"The ability of AB-CRC researchers to provide support during the critical hours of a viral outbreak such as Hendra testifies to the value of the AB-CRC's research programs dedicated to technologies to enhance detection of emerging infectious disease," said AB-CRC CEO Stephen Prowse. "It is a credit to our researchers that they can operate successfully within both the research and reaction phases of the viral outbreak", he added.



Carol de Jong and Anne Zeddeman (a visiting student from the Netherlands) collecting samples during the recent Hendra outbreak at Cawarall in central Queensland

Freedom Forum

By Tony Martin, Department of Agriculture & Food, Western Australia

Over the last few years an AB-CRC project team, led by Dr Tony Martin, compiled a set of methods for quantifying confidence freedom from disease at a national level (see www.abcrc.org.au/pages/project.aspx?projectid=77).

In May 2009, a forum was held in Canberra to assess the attitudes of potential users to the 'freedom methodology'. The purpose was to gather opinion on the perceived usefulness of the system and the obstacles to, and opportunities for, application in animal health in Australia.

Potential end-users of this methodology, including Commonwealth and State Government representatives and delegates from the CSIRO's AAHL and Animal Health Australia, came together at the forum to discuss these recently developed tools for demonstrating Australia's disease-free status, assessing the disease status of trading partners, and optimising the use of limited surveillance resources.

The *Freedom Methodology*¹ is a stochastic scenario tree modelling approach to assessing the efficacy of surveillance activities for disease detection; allowing incorporation of all types of surveillance information and the use of information collected in a non-random or biased way. Its main areas of use are in surveillance design (optimising the use of limited resources) and estimating certainty in our claims to freedom from diseases for international trade purposes.



Freedom Forum participants

¹ [Various reports and publications are available at <http://freedom.ausvet.com.au>].

Attendees were clearly enthusiastic about the system, and the forum led to a clear sense of the importance and relevance of this type of approach in addressing the inevitable requirement for transparent, science-based justification of Australia's claims to disease-free status. It was agreed that applications of the methodology at the national level should address diseases for which there is a high level of confidence in the result of the analysis (i.e. in both our free status and in the surveillance to be assessed), and which are of importance to international trade. The two leading contenders identified at the forum were bovine tuberculosis and avian influenza.

The forum also identified a number of additional recommendations for the project team and follow-up activities are already underway. The final report from the forum can be found at www.abcrc.org.au/pages/TechTransfer.aspx?MenuID=14#AL.104F

Jo Edmondson takes on new role with the University of Western Australia

By Deb Cousins, Director Application & Linkage

I am delighted to congratulate Jo Edmondson on her appointment as Postgraduate Education Officer at the University of Western Australia.

Jo commenced her role as Senior Project Officer Application & Linkage with the AB-CRC in November 2007. She has exceptional talents in research analysis and synthesis and has demonstrated these skills by completing a comprehensive review of Hendra virus knowledge, and in preparing numerous adoption forum reports. Jo has also contributed substantially to 'bedding down' our knowledge exchange and adoption framework, and communicating this to partners.

In addition Jo has been an extremely effective Secretary to the EUC Standing Committee, contributing to management committee and

reviews of research projects for adoption needs, playing a major role in the development of the survey instrument and focus questions for the knowledge brokering and technology transfer surveys and being instrumental in development of the FileMaker database used for managing projects and forums.

We always knew that Jo was eminently employable and it was no surprise to us that she was successful in her first job application. We sincerely thank Jo for her outstanding contribution over the past years and wish her well in her new role. Jo's analytical research and writing skills, understanding of social research methods, insightfulness, creativity and team-based approach have added tremendous value to the A&L Program and the AB-CRC overall. We wish her the very best in her new role, which we know she will do admirably.

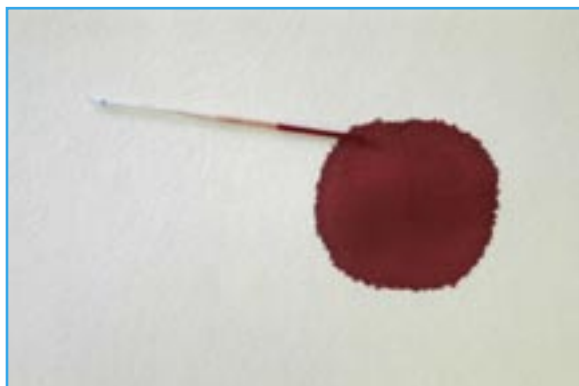
AB-CRC develops new way to store serum in hostile environments

By Liz Williams, AB-CRC Project Officer

Difficulties preserving serum samples in hot and humid environments may now be overcome following the development of a paper-based collection and storage system by AB-CRC researcher Celia Smuts from Murdoch University, Western Australia.

Using Celia's new protocol, antibodies from blood and serum samples collected in high temperature and humidity environments can be preserved for up to 12 weeks without refrigeration, specialised equipment or operator training.

The paper-based system of serum collection and storage will assist staff in the field to collect samples, and may be applied to a wide range of wildlife, public health or agriculture research projects that require the sampling and storage of samples from remote locations for later use in antibody assays.



“Treating filter paper with post-coating buffer is not necessary for all conditions,” said Celia. “However, if my samples are subjected to high humidity in transit to the lab, I know that with this system I am far more likely to detect antibodies that were in the host,” she added.

The technology was one of a number of serological tools initially developed to enhance detection of surra, a parasitic infection caused by *Trypanosoma evansi* which is not present in Australia and PNG but is commonly found in Timor Leste.



Dr Rupert Woods, Manager of the Australian Wildlife Health Network, believes the new technology could improve the quality of information gained from surra surveillance in remote areas, and play a role in the detection of wildlife diseases.

“Surveillance in wild animals is often difficult and expensive,” said Rupert. “The paper-based system extends the life span of antibodies in dried blood, allowing for relatively easy and reliable sample collection and more importantly storage and transport. The technique may also be useful to assist surveillance for other diseases with wildlife as part of their ecology, though further research would be required to validate specific tests,” he added.

Validating a new molecular test for surra

By Liz Williams, AB-CRC Project Officer

One of the main discussion points at the AB-CRC’s 2008 Diagnostics Forum was the need for validation of newly developed molecular tests before they can be used in routine diagnostics.

A real-time PCR assay to detect *Trypanosoma evansi*, the parasite which causes surra, was developed as part of a previous AB-CRC research project. Surra is a chronic wasting disease spread by biting flies. With additional funding from the AB-CRC’s Application & Linkage Program, the project team headed by Dr Trevor Taylor (CSIRO’s AAHL) tested the performance of the real-time PCR in the field. As Australia is free of surra, the team tested samples from Indonesia and the Philippines where the disease is endemic. The results from testing in Indonesia showed that the relative diagnostic specificity of the real-time PCR test is extremely good; however a surprisingly low incidence of disease (confirmed by serological testing) meant that the team was unable to get meaningful results for the relative diagnostic sensitivity of the test.

In the Philippines, samples were collected from several regions with differing rates of infection to see how the test would perform with a range of clinical disease. The real-time PCR was compared with conventional tests for detecting *T.evansi* such as the mouse inoculation test and



Knowledge in Practice and Policy Workshop II delegates

modified haematocrit centrifugation test. Two antibody detection tests were also performed to obtain an overall understanding of the animal's exposure to *T.evansi*. Analysis of the samples from the Philippines also suggested very good specificity, although the relative diagnostic sensitivity was not as good as expected.

REPORTS

Second workshop examines the science-policy interface

[Knowledge into Practice and Policy Workshop II](#)
6-7 May
Brisbane

By Jo Edmondston, Senior Project Officer

Following on from the success of the *Knowledge into Practice and Policy* workshop held in 2007, a second workshop in this series explored the processes involved in getting science knowledge into policy and practice. Running over two days, the workshop brought together over 40 professionals across the natural resource management, environment, health, and agriculture sectors to share their experiences

and knowledge about the policy making process, barriers at the science-policy interface, and how to improve adoption.

Partially supported by the AB-CRC, the workshop was represented by Debby Cousins and Jo Edmondston. Working alongside Kate Andrews (consultant and former Knowledge and Adoption Manager, Land & Water Australia) and representatives from the Queensland Government Department of Environment and Resource Management, Deb and Jo formed part of the steering committee. In addition, Deb presented at the workshop, providing one of four case studies designed to stimulate discussion of varying sector approaches to policy and practice change, and Jo attended the workshop and prepared the final written report.

The workshop covered four main areas associated with the science-policy interface: science policy issues, organisation culture, research-policy interface and monitoring & evaluation. A number of recurring themes arose throughout the presentations, case studies, facilitated discussion and small group work that comprised the workshop. These included:

- that policy development is a complex, dynamic process that differs significantly from the research process;
- the need for institutional changes to policy making process;
- that bridging the science policy divide requires the development of long term relationships, significant input of energy and commitment, and researchers to be responsive and sufficiently prepared;
- the significant value in regular engagement between researchers and policy makers;
- the need for adoption management, monitoring & evaluation to be incorporated into all planning stages of a research project.

Anyone with an interest in this area is likely to find the final report interesting; not only does it summarise the workshop, reproduce the presentations, and expand on the themes listed above, it also has a resource list of useful references, web pages, tips and tools. While the next workshop in this series is not likely to be held within the lifespan of the AB-CRC, a third workshop is planned. For those who may be interested in attending, details of the organising committee can be found in the final report. (See http://www1.abcrc.org.au/uploads/5c94f8f6-7dc1-4f74-a9e4-86479f7786f8/docs/KiPP2_FinalReport.pdf).

AB-CRC Knowledge Brokering Awards 2009

By Deb Cousins, Director Application & Linkage

The Application & Linkage Program promotes knowledge brokering as one of the key elements of the AB-CRC's knowledge exchange and adoption framework. This framework has evolved as the AB-CRC has matured and reinforces our view that the relationship between researchers and end users is critical to uptake of research knowledge. Knowledge brokering helps ensure we have the right science

focus and the end result of our research is useful. The A&L Program assigns specific knowledge brokering roles to particular individuals, giving them responsibility for promoting interaction and communication between researchers and end users. We also encourage all researchers to think seriously about how the research can be used and to engage with end users to ensure they are aware of developments, even if they are not designated knowledge brokers.

Every year from 2006 we have acknowledged individuals for their knowledge brokering efforts. In 2009 three individuals, one of which is not a designated knowledge broker, were recognised with Knowledge Brokering awards at the AB-CRC annual workshop.

Testimonials for these individuals are provided below.

Nigel Perkins **AusVet Animal Health Services**

Nigel is a designated program knowledge broker for the *Advanced Surveillance Systems* Research Program, by far the largest of the AB-CRC research programs (23 research projects and 36 students), as well as project knowledge broker for AB-CRC project 3.066R *GIS mapping of cattle market service areas using the National Livestock Identification System*.

Nigel is a motivated program leader with an exceptional understanding of his portfolio and a willingness to broker exchanges between researchers and government and industry end users to facilitate project development, revised milestones and research outcomes. His performance as a facilitator and broker is exemplified at strategic AB-CRC events such as the Bovine Syndromic Surveillance System stakeholder workshop and the peri urban pig surveillance adoption forum.

Andrew van den Hurk Queensland Health

Andrew is the designated project knowledge broker for two AB-CRC projects - 2.027RE *Studies of the potential colonisation and establishment and establishment of Aedes albopictus as an arbovirus vector in Australia* and 2.065R *An assessment of the risk of establishment of the newly emerging alphavirus - Chikungunya virus - in Australia*.

Andrew works in an end user organisation and clearly understands the benefits of applied research; he is also an exceptional presenter and can articulate his findings to end users with ease. He is also proactive in working with end user committees, such as the National Arbovirus and Malaria Advisory Committee to ensure that research findings result in practice and policy change as evidenced by his participation at Arbovirus forums and interactions with vector control program committees.

Celia Smuts PhD student at Murdoch University

Celia is an informal knowledge broker at the AB-CRC. Whilst completing an AB-CRC supported PhD to develop serological tools to enhance the detection *Trypanosoma evansi* in Australia and the region, Celia developed a method for the preservation of antibodies in hot and humid environments. Celia was able to recognise the significance and utility of this method beyond the immediate needs of her doctoral research, and committed time to sharing this method with potential users in the fields of wildlife, public health, and agriculture, both before and after completing her studies.

Molecular Biology Short Course attracts 38 delegates

AB-CRC Introduction to Molecular Techniques
30 June – 1 July
Gold Coast International Hotel

By Jo Edmondston, Senior Project Officer

A recent AB-CRC supported short course in molecular techniques was well attended by 38 delegates who wished to improve their understanding of molecular biology. Designed for participants with little or no background in molecular biology, the course aimed to improve delegates' knowledge of the theoretical basis and application of molecular techniques, and enable them to comfortably interpret molecular biology research papers and communicate in molecular terminology.

Advances in molecular biology in past decades have contributed substantially to the understanding of emerging infectious diseases. As new and existing DNA technologies develop they will continue to provide opportunities for advancing animal, public and wildlife health research and diagnostics. Practitioners and researchers familiar with molecular biology techniques will be better placed to appreciate the approaches that can be taken to addressing the biosecurity challenges of the 21st Century.



Delegates prepare a model of the structure of DNA from marshmallows, jubes and toothpicks.

The course was timed to coincide with the Australian College of Veterinary Scientists Science Week. The Molecular Techniques component formed Part One of the short course and comprised 10 lectures interspersed with activities and worked examples. This part of the course was prepared and delivered by the AB-CRC's Jo Edmondston. Part Two of the course covered Molecular Epidemiology and was delivered by Dr Petra Mullins of Massey University, Palmerston North, New Zealand.

Feedback from delegates was very positive, with comments including: "molecular techniques are no longer a mystery", they had a "much better understanding of a complex subject", and "were more comfortable in this space now". Plans are underway to run a similar course in introductory molecular techniques on Australia's western seaboard.

SHORT COURSES

Quantitative Risk Analysis for Animal, Plant and Public Health

5-8 October 2009 - Canberra

Run by Broadleaf Capital International Pty Ltd, this course will appeal to any researchers and public policy professionals who undertake or use risk assessment in their work. No prior training in risk assessment or statistics is necessary.

The cost for the course is \$3000 (exc. GST). A 10% discount is available for group registrations of three or more from any one agency. Cost includes teaching materials, lunch and tea/coffee on each of the four days.

Participants will need to bring a laptop running Microsoft Excel, and a demonstration or purchased copy of Palisade @Risk.

For more information, please contact Sam Beckett at Beckett@Broadleaf.com.au or phone (02) 6236 8806 or 0416 092 041.

AB-CRC Short Course : An Introduction to Epidemiology

19-21 October - Perth
3-5 November - Canberra

Registration closes 5 October

A thorough understanding of the application of epidemiological principles is an important attribute for students, practitioners and researchers in animal health.

The course is designed to assist with the education and training of animal health professionals, Cooperative Research Centres students and researchers in Australia so that they are better able to understand issues of research project design, planning and analysis and the interpretation of data from all sources for improved decision-making.

AB-CRC Short Course : An Introduction to GIS

8-10 December 2009
Curtin University, Perth

Registration closes 19 November

Geographical Information Systems (GIS) provide tools for the visualisation and analysis of spatial data. Understanding the spatial distribution and determinants of disease is one of the most fundamental aspects in identifying causes and appropriate strategies for disease interventions.

The aim of this 3 day course is to provide a wide range of people working in the area of animal, plant and human disease control and surveillance with the skills and the resources to incorporate the most common and useful GIS procedures into their daily work. This course is targeted at people with little or no experience of GIS.

For more details about these AB-CRC courses, please visit www.abcrc.org.au/pages/Education.aspx?MenuID=43. For any further information, or to join the short course mailing list, please contact Erin Rummer (erin.rummer@abcrc.org.au) or phone (08) 9266 1644.