

Diagnostic kits to improve pet and farm animal welfare

Spinout company *ReactivLab* focuses on animal welfare¹. The company provides diagnostic kits that can help to build a fuller picture of an animal's health. It was formed following BBSRC-funded research at the University of Glasgow into animal blood proteins.

ReactivLab was founded in 2007 by Professor David Eckersall from the School of Veterinary Medicine at the University of Glasgow². It specialises in the diagnosis and prediction of animal illnesses based on the analysis of biological markers, called acute phase proteins



Credit: *ReactivLab/Avacta*

(APPs), present in animal blood. Eckersall's work has shown the benefits of measuring APPs in a variety of conditions, including bovine mastitis and pneumonia, feline infectious peritonitis and canine leukaemia. The technique could benefit pet owners, veterinary surgeons, farmers and scientists³.

In 2010 *ReactivLab* was acquired by *Avacta Group plc*, a healthcare technology and consumables business based in West Yorkshire^{4,5}, for up to £5M. Its animal health division provides diagnostic products and services for the global veterinary diagnostics market, which is worth over \$2Bn annually⁶.

Measuring animal welfare

APP tests have been used as a diagnostic tool in human medicine for some time. Now, they are also proving useful in the care of a variety of domestic and farm animals for general health checks, tracking recovery or response to treatment, and in the identification of inflammatory responses⁷.

Professor Eckersall says, "Over the past few years we've taken original discovery of the acute phase proteins in domestic animals and developed assay methods that have allowed the health status and wellbeing of animals to be measured objectively. Most recently, the innovations made in our research laboratory have been turned into commercial diagnostic kits enabling a global impact to be achieved from our basic research."

Impact Summary

ReactivLab provides diagnostic kits that can help to build a fuller picture of an animal's health.

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Secured a global supply agreement for canine tests.

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APPs are produced by the liver and change in concentration in response to inflammation or infection. The concentration of plasma proteins alters significantly 24 to 48 hours after an inflammatory stimulus and can provide an objective measure of the health status of an animal. Measuring their concentration is recognised as being especially useful in detecting the presence of sub-clinical infection – when an animal could pass on an infection but before disease symptoms appear – enabling early intervention. Furthermore, serum (total) concentrations of APPs in blood are related to the

severity of the underlying condition, and are a means of evaluating both the presence and extent of disease in animals.

Traditionally, white blood cell (WBC) counts have been used to identify and measure an inflammatory response. However, APPs provide a better alternative or complementary test to WBC counts because APP tests are wider-ranging, more sensitive, have greater stability, and can be used at an earlier stage for prognosis and diagnosis.

“Our work on acute phase proteins as diagnostic biomarkers in animals is under continuing development,” says Professor Eckersall. “Currently, BBSRC-funded CASE postgraduate students are expanding the species coverage with projects designed to identify and develop biomarkers of disease in chicken, and Atlantic salmon. These are both species where an early marker of disease would be of great value.”

“The commercial potential of acute phase protein testing and diagnostics based on the use of APPs is considerable, and since the acquisition of ReactivLab we’ve secured our first global supply agreement for canine c-reactive protein test kits and expect to sign further similar agreements over the coming twelve months,” says Alastair Smith, CEO of Avacta Group. “What is particularly exciting for us is the potential to develop multiple product lines around these tests: laboratory based testing services; testing kits for use by third-party

laboratories; and point-of-care testing products with a wide range of applications in animal health.”

Notes and references

1. See: www.reactivlab.com
2. See: www.gla.ac.uk/researchinstitutes/iii/staff/daviddeckersall
3. Eckersall PD, Bell R. (2010) Acute phase proteins: Biomarkers of infection and inflammation in veterinary medicine. *Vet J.* 2010 Jul;185(1):23-7. doi:10.1016/j.tvjl.2010.04.009.
4. See: www.avactaanimalhealth.com
5. See: <http://www.talentscotland.com/Workers/employers/R/ReactivLab-Ltd.aspx>
6. See: <http://www.thefreelibrary.com/Veterinary+Diagnostics+And+Equipment+Global+Market+Report+Is...-a0173883005>
7. Ceron JJ, Eckersall PD, Martýnez-Subiela S. (2005) Acute phase proteins in dogs and cats: current knowledge and future perspectives. *Vet. Clin. Pathol.* 34(2): 85-99.