SUGAR CHEMISTRY TO PROVIDE SIMPLE DIPSTICK TEST FOR EQUINE FLU

Iceni Diagnostics says rapid non-invasive test would allow routine screening

A simple dipstick test could be used to identify equine flu, according to Professor David Russell, Chief Scientist at Iceni Diagnostics. The company has gained a patent for its approach to detecting and distinguishing between human and avian flu and considers that with slight modification the test could provide a rapid non-invasive test for horses.

Prof Russell co-founded Iceni Diagnostics with fellow scientist Professor Robert Field, a project leader at bio-science institute the John Innes Centre and an international expert in carbohydrate chemistry.

Prof Field explains that 90% of infections use carbohydrate recognition to bind with targets in human or animal bodies. As the mechanism is specific to each particular strain of flu, it can be used to form a sensor for the disease.

He says: “Our sensor uses sugars tagged with inexpensive gold nanoparticles; if the virus is present it will stick to the particles, pulling them closer together. This creates a photophysics reaction and the sample changes colour.

“We have found that there are differences between the carbohydrate detectors in the different types of flu. It is therefore possible to use a colour change to identify presence and absence of the virus and to distinguish between them.”

By using sugars instead of more commonly used protein-based diagnostics, which need cold storage, the simple low technology approach has potential for use worldwide with minimal training, providing results in seconds. It could be used as a routine screen to give an 'all clear' to horses before they travel to race meets and other gatherings.

Prof Russell explains that the new assay based on gold nanoparticles is much faster than current methods of detection: “Preventing a new influenza pandemic requires both

vaccination and antiviral drugs to be administered within 48 hours of the infection in order to contain the disease.

“Current methods of detection require isolation and culturing of the virus, which may take several hours or even days to get the results. Using our test it would be possible to quickly identify infected animals at the stables and quarantine them, preventing the spread of disease.”

Iceni Diagnostics is currently looking for investment to modify its sensor to provide a dip test for equine flu. Carbohydrate chemistry is complex, which provides a high barrier of entry to competitors, and Iceni’s patented dip test diagnostic is proven for other flu strains.

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References

Results showed that functionalised gold nanoparticles were able to detect the human influenza virus X31 (H3N2) within 30 minutes. It was able to distinguish between human and avian influenza. This provides the basis for an innovative bioassay for the specific recognition and detection of influenza virus strains in clinical samples - Field, Russel et al, *Organic & Biomolecular Chemistry* (2013) 11, 7101

https://pubs.rsc.org/en/content/articlelanding/2013/ob/c3ob41703d/unauth#!divAbstract

About Iceni Diagnostics www.icenidiagnostics.com

Iceni Diagnostics is developing carbohydrate-based therapeutics and point-of-care diagnostics for infectious diseases. The company was co-founded by Professor Rob Field CEO, project leader at John Innes Centre, Honorary Professor of Chemistry at UEA and Editor-in-Chief of the leading international journal Carbohydrate Research, and Professor David Russell CSO, Emeritus Professor of Chemistry at UEA and founder of Intelligent Fingerprinting.