



Australasian Pork Research Institute Ltd APRIL

PROJECT SUMMARY

Project Number and Title:

A1-106 *A lab on a chip for real time pain and animal welfare biomarker measurement*

Project Leader: Abel Santos (The University of Adelaide) and Paul Verma (SARDI/The University of Adelaide)

Project Participants: Abel Santos, Paul Verma, Cheryl Suwen Law

Aims and Objectives: To develop technology for a lab on chip that forms that basis of a pen-side diagnostic for pain and welfare biomarkers.

Experimental design:

The project was divided into three stages: i) engineering a microfluidic chip and optimising geometry and sensitivity; ii) assessing the surface chemistry for selective sensing of welfare biomarkers; iii) validating the sensing performance in complex matrices.

Key Findings:

This project has delivered lab on a chip technology that can address the identified need. This system can perform a total of 3×12 readings (average of 3 readings per biomarker for a total of 12 biomarkers) by harnessing microfluidic channels generated on a nanoplasmonic glass slide. The results generated from phases i, ii, and iii have demonstrated the potential of the sensing technology to quantify biological analytes in complex liquid matrices, with precision, reliability, reproducibility, with high throughput.

Applications to Industry:

The technologies developed from this project have the potential for commercialisation by providing an effective tool to screen key biomarkers to quantify affective states in pigs, and is potentially applicable to other livestock species and diagnosis of human diseases and biomedical conditions.