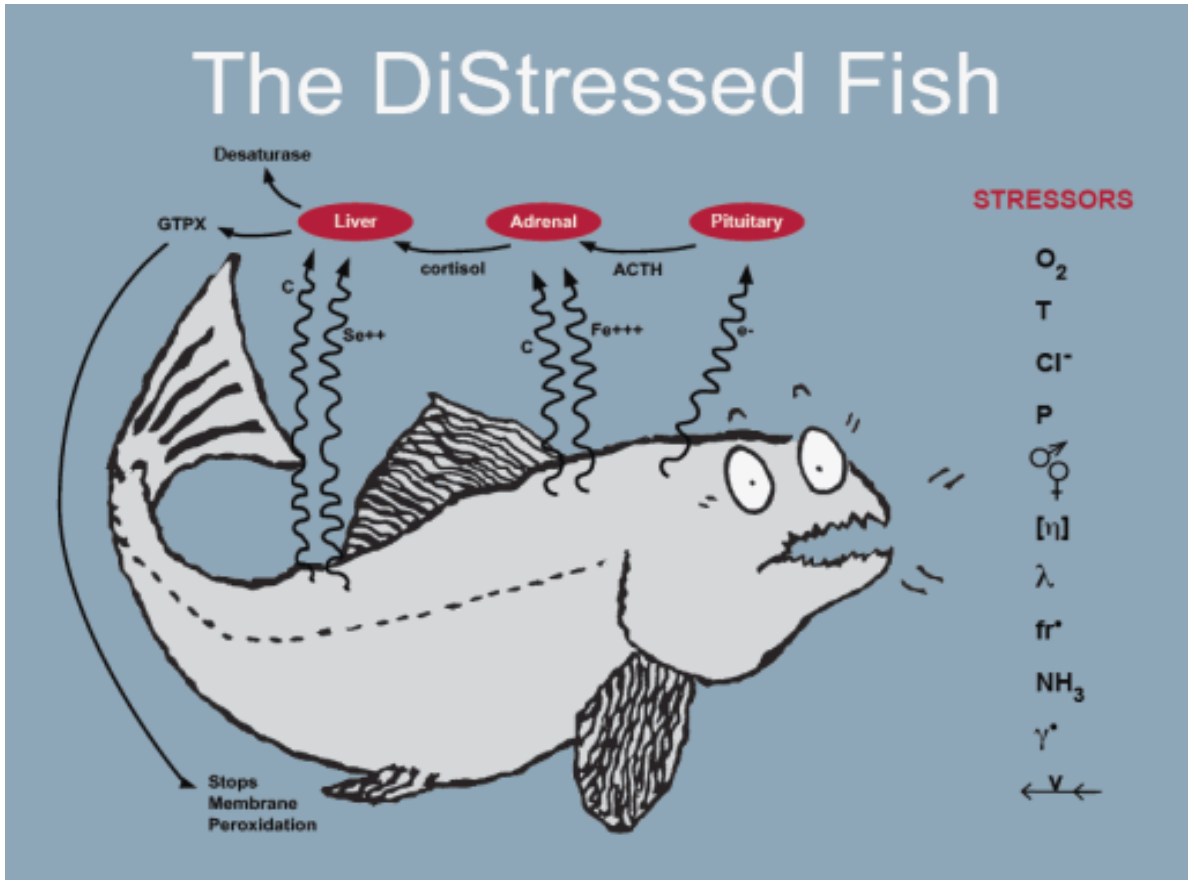
2nd Symposium on Welfare in Aquaculture
Operational Welfare Indicators for Fish

Innovation on OWI using sensors

Dr Sofia Teixeira

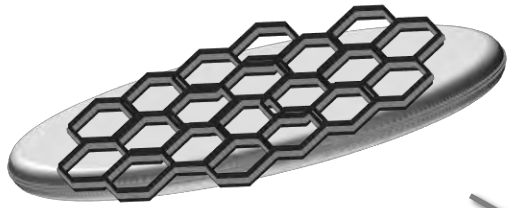
Tyndall National Institute, Ireland

Tyndall National Institute
Institiúid Náisiúnta



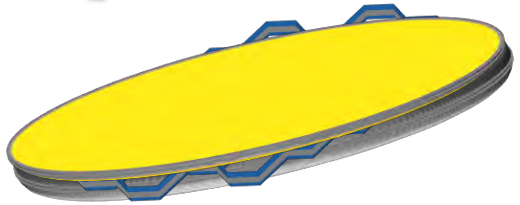
Flexible, label free Immunosensor

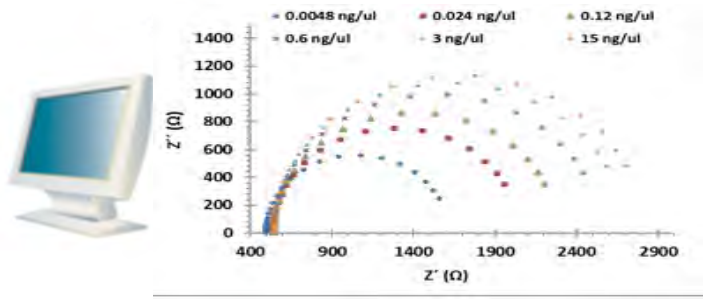
Electrochemical output

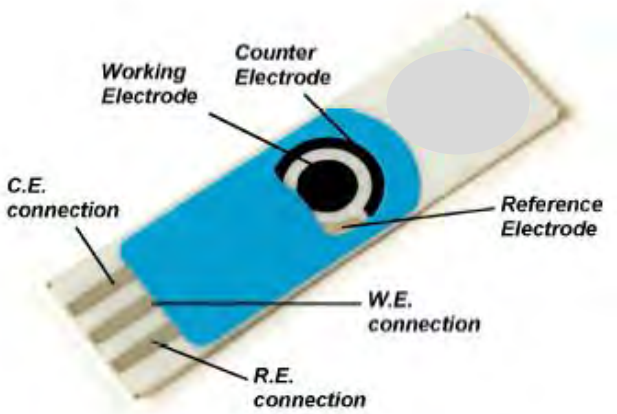


Materials

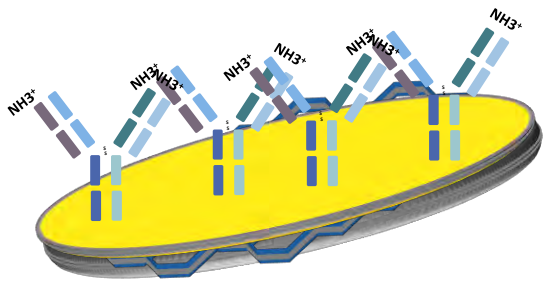
Surface Chemistry



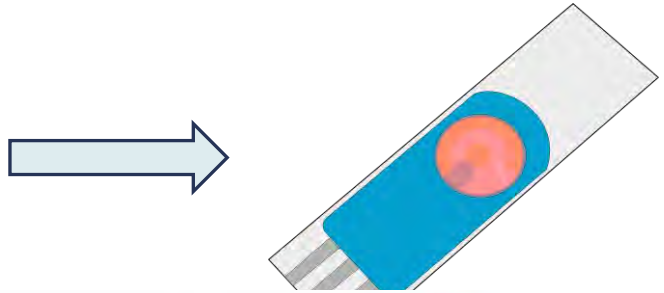




Bio-receptor

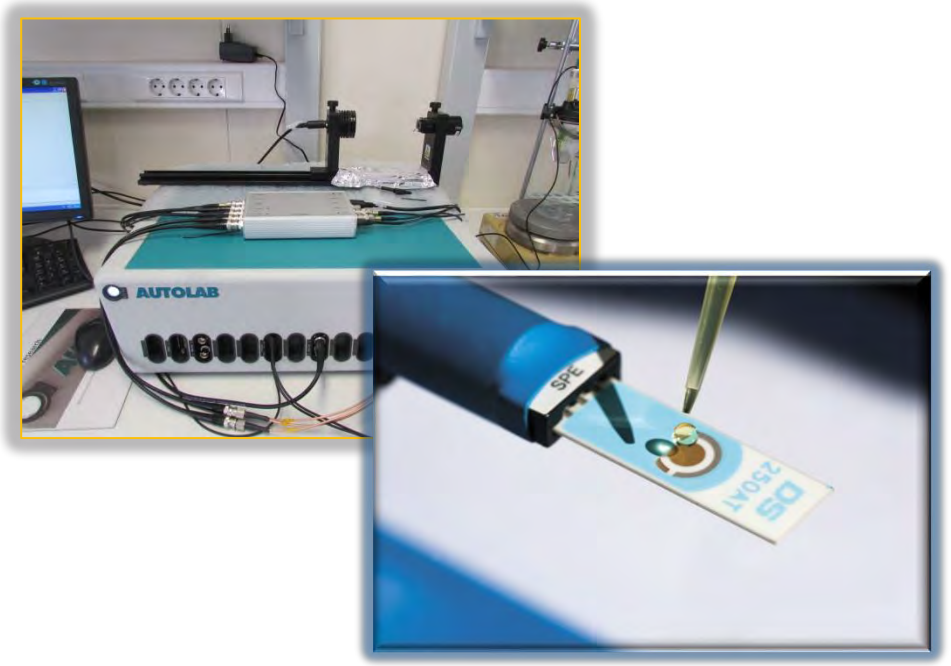


Electrochemical biosensing platform - quantification of biomarkers



1. Ide

2. Biosensor development for objective biomarker selection



Biomarker for ...

DIAGNOSIS

Sensitivity, specificity, and accuracy

Be prognostic of outcome and treatment

SCREENING

Highly specific, minimize false positive and negative

Easily detected without invasive procedures

Cost effective

What type of samples can we use?

- Blood
- Urine
- Other body fluids
- Tissue samples

Opportunity

- ✓ Cost effective fabrication with flexible functionalization chemistry
- ✓ Miniaturisation, high throughput, selective, sensitive and portable

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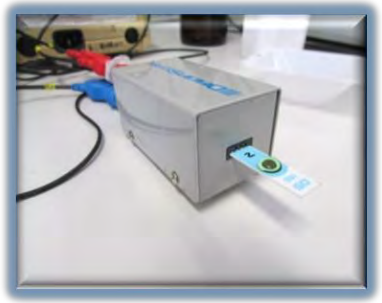
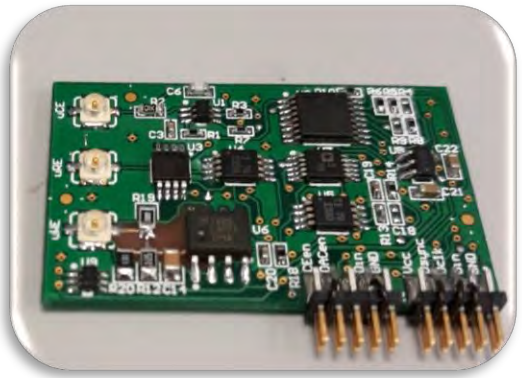
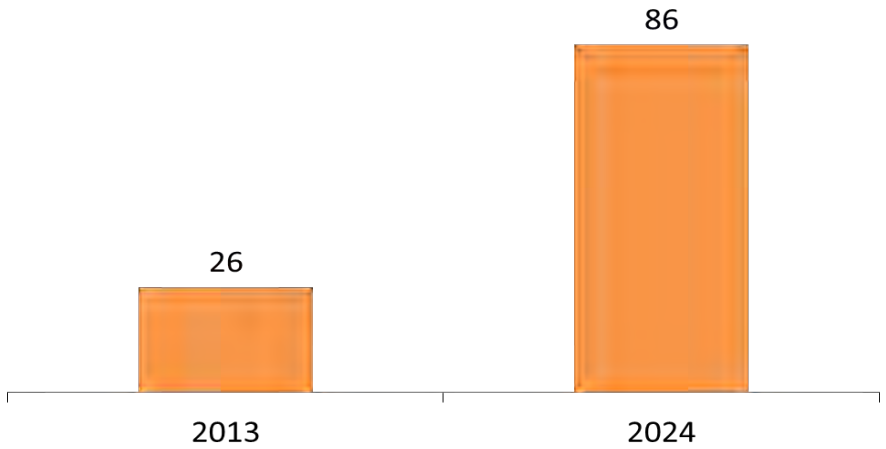


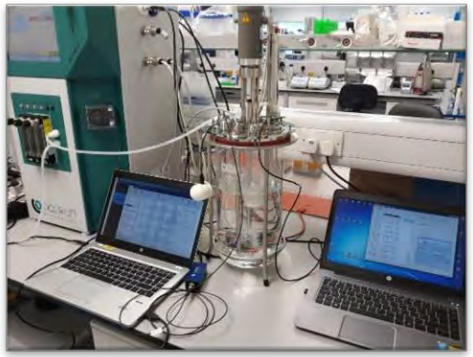


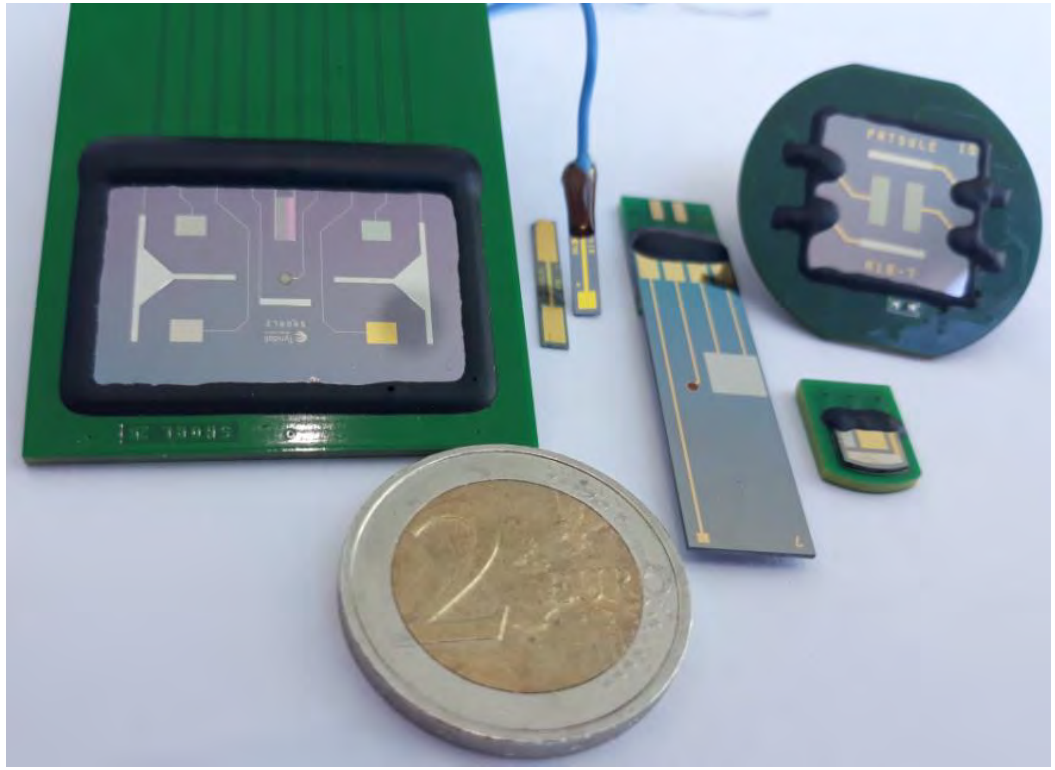
Non-invasive, point of care, wearable compatible environmental applications

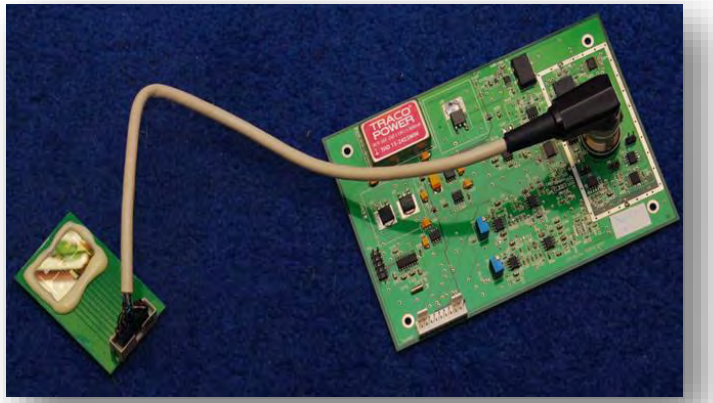


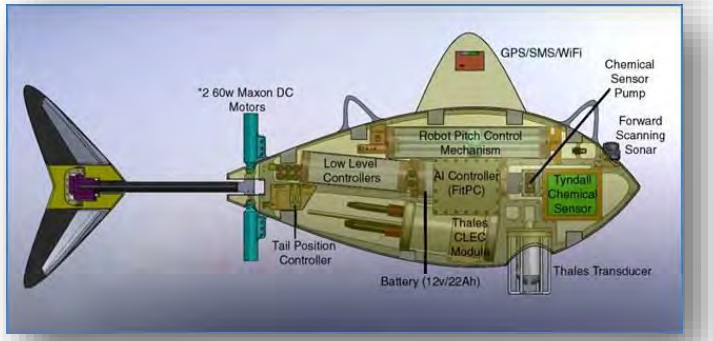
22.9% annual growth by 2024, +10 million tests per year
(2014 Root Analysis Market Report)

Smart Sensors for Health and Wellness developed in Tyndall









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FP7-ICT-231646

Cortisol

Exposure to causes of stress

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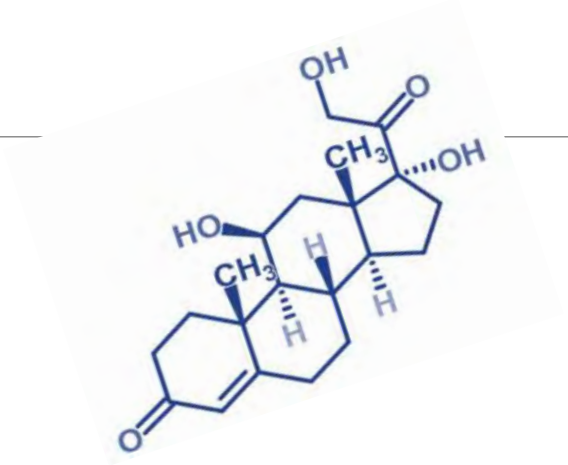
Production and secretion of cortisol

from adrenal glands



cortisol levels
10^{-7} – 10^{-6} M (high)
10^{-9} – 10^{-8} M (low)

Altered cortisol levels

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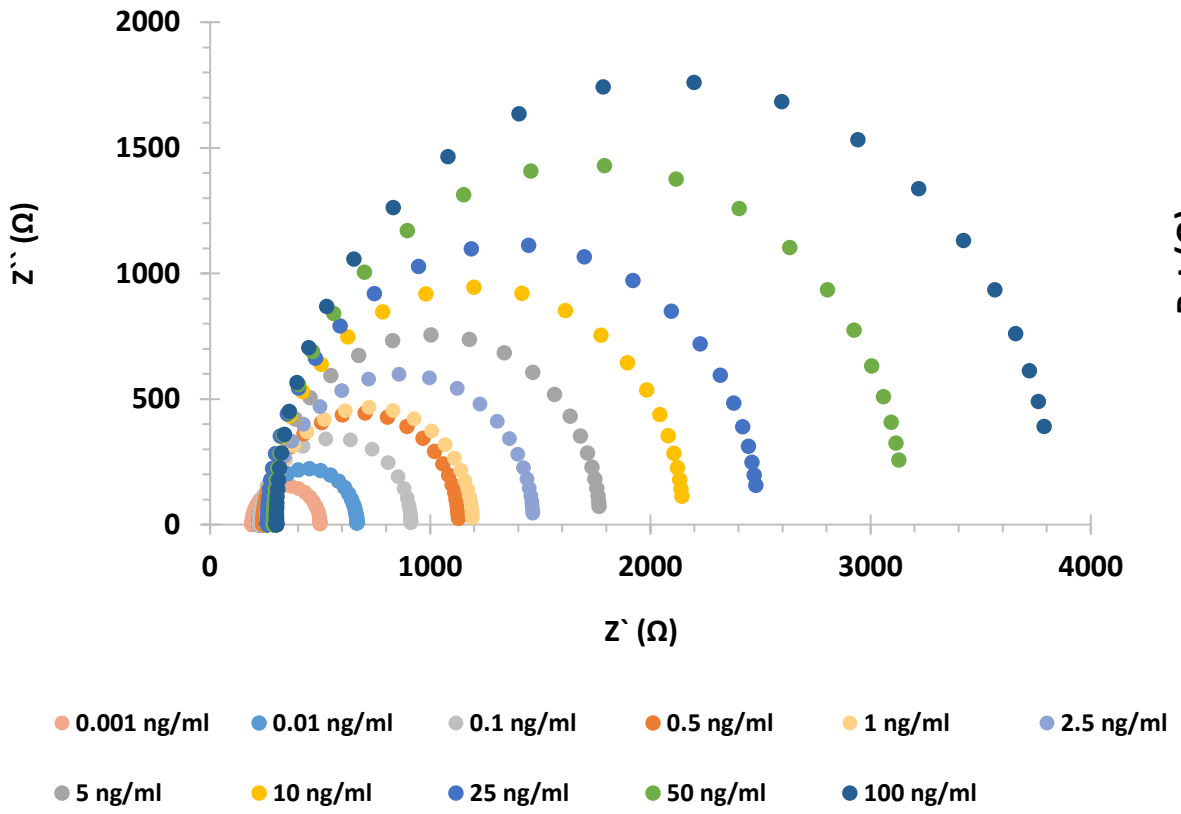
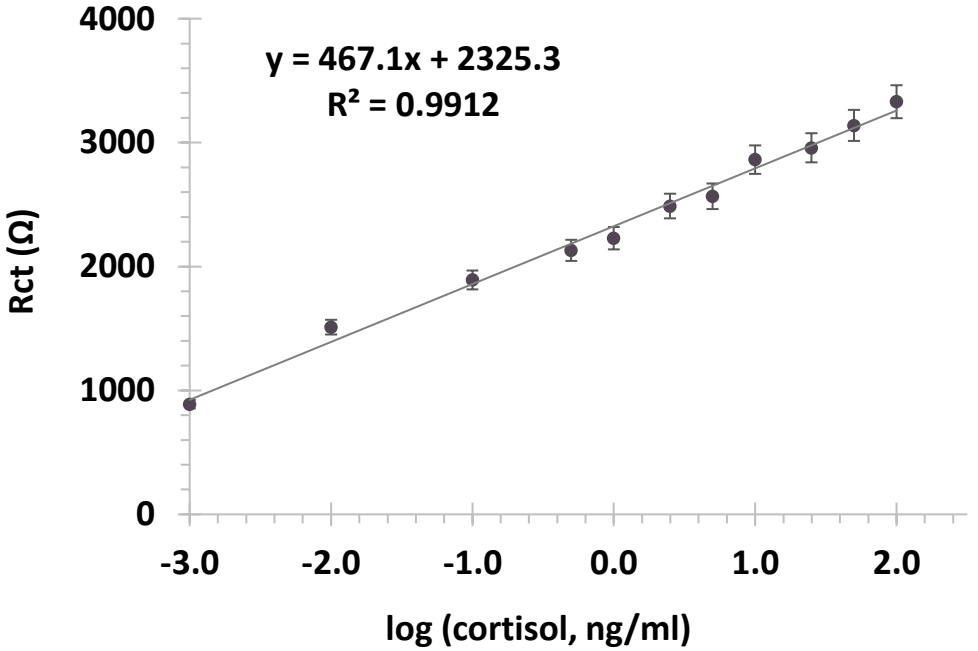
linked to a range of stress-related disorders.

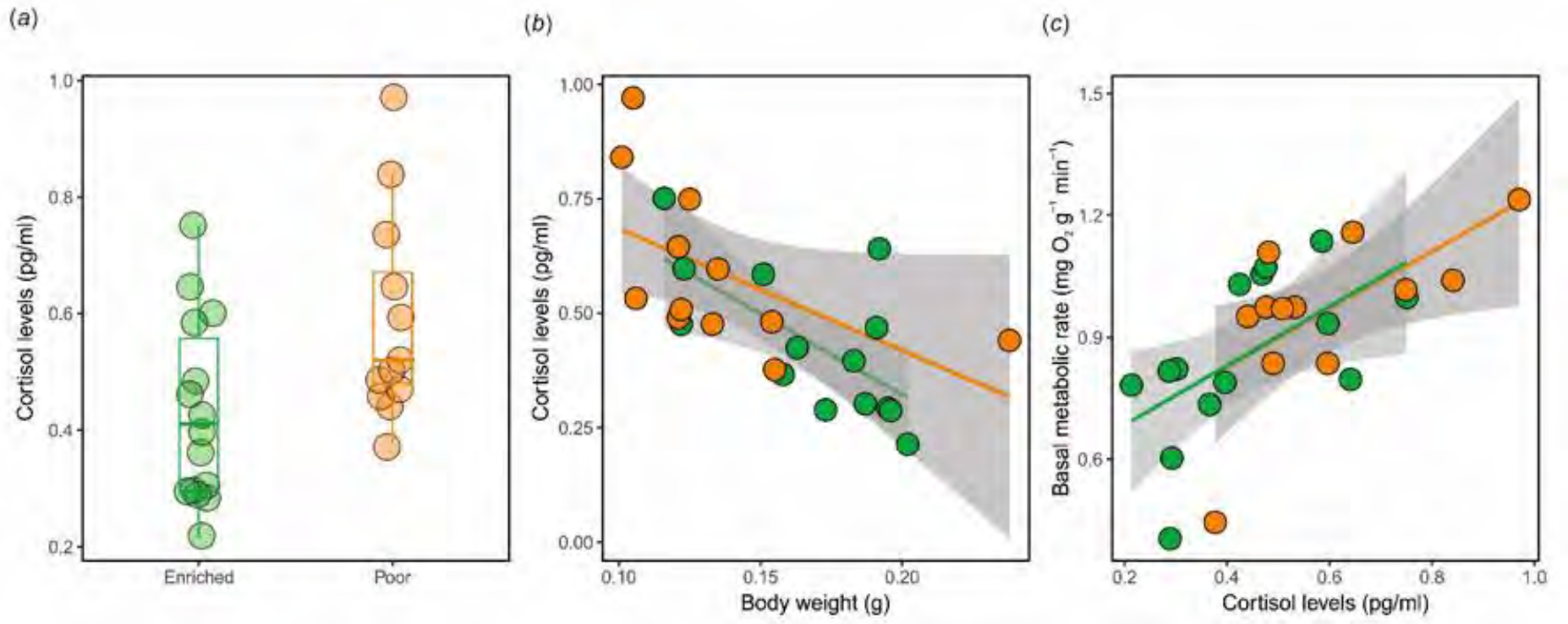
Analytical Response



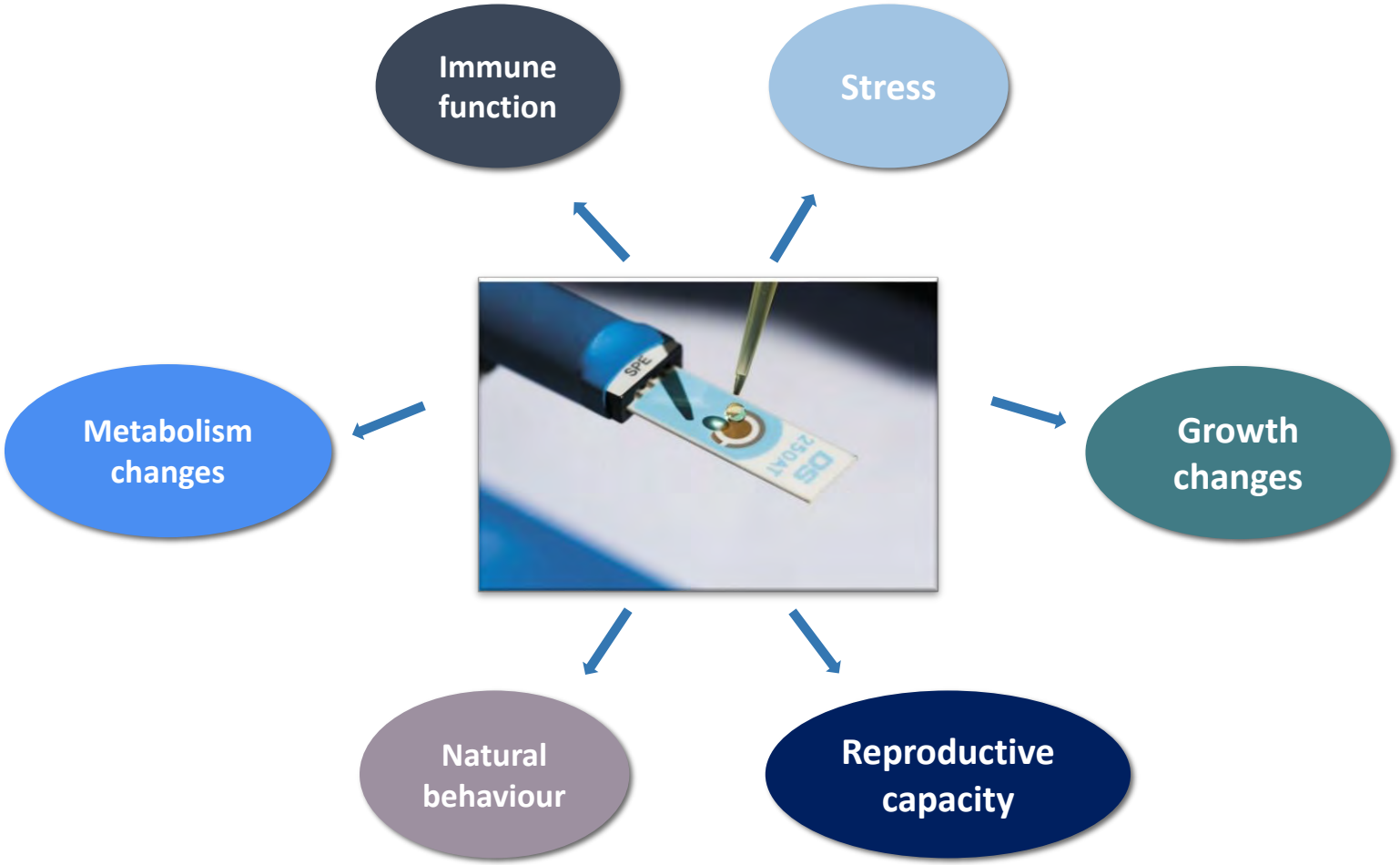


LOD = 0.005 pg/ml = 5fg/ml

Analytical Response



Applications on Welfare in Aquaculture



Dr. Sofia Teixeira, Senior Researcher
Tyndall National Institute, University College Cork,
Cork, T12 R5CP, Ireland.

E-mail: sofia.teixeira@tyndall.ie