CASE STUDY:

# FLOW CYTOMETRY

CORE TECHNOLOGIES
at UCD Conway Institute

## Our Client

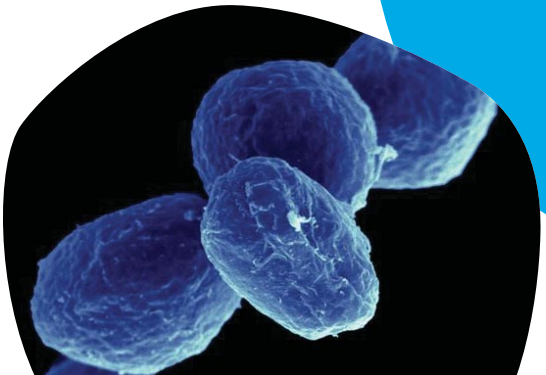
Radisens Diagnostics develops point-of-care diagnostic devices for the clinical diagnosis of various blood ailments in GP settings. The technology is based on flow cytometry principles.

## Research Question

**We wanted to do a method comparison for bead-based sandwich immunoassays between Radisens' technology and the equipment within the flow cytometry core, to understand our competitive positioning.**

'The expertise in the flow cytrometry core has been very helpful in helping Radisens to validate the portable cytometer technology under development in-house. We were able to conduct method comparisons with a range of commercially available instruments. The guidance given by Alfonso on clinical use cases has further strengthened the company's development.'

**Jerry O'Brien**
*CEO, Radisens Diagnostics*



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## Research Question

**Does the uptake rate of fluorescent nanoparticles vary throughout one cell cycle? How does the position of a given cell in the cell cycle affect nanoparticle internalisation? How does synchronisation of cells in one cell cycle phase affect nanoparticle uptake?**

## Our Approach

Human lung cancer cells (A549) were exposed to fluorescent polystyrene nanoparticles and stained with EdU (a nucleoside analogue actively incorporated during DNA synthesis) and 7-AAD dye for total DNA content. The double staining greatly enhanced the resolution of the cell cycle phases compared to DNA staining alone, which enabled the study of nanoparticle uptake in real time during cell cycle progression and evolution of a population of cells without the need of artificially synchronising the cultures.

## Resulting Publication

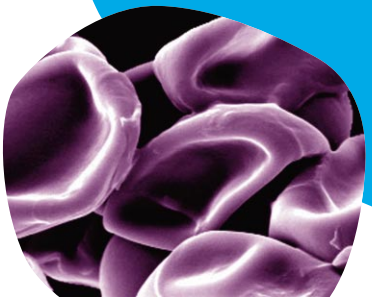
*Kim J.A., Aberg C., Salvati A., Dawson K.A. (2011). Role of cell cycle on the cellular uptake and dilution of nanoparticles in a cell population. Nature Nanotehnology doi:10.1038/nnano.2011.191*

'We are really grateful to Alfonso for his time and expertise when setting up and optimising the cytometry protocols, and also for his kind assistance with the challenges encountered during data acquisition.'

**Professor Kenneth Dawson,**
*UCD Centre for BioNano Interactions*

**Dr Anna Salvati**
*postdoctoral fellow*

**Ms Jong Ah Kim**
*PhD student*



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# FLOW CYTOMETRY

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## Research Question

**Can we make sensitive and quantitative measurements of intracellular calcium release in transfected cells?**

## Our Approach

We wanted to characterise the effects of a regulator of G-protein signalling on the release of calcium from intracellular stores. For this, measurements of thrombin induced calcium release needed to be established in HEK293 cells. Importantly, calcium measurements had to be combined with the sensitive detection and selection of transfected cells.

## Resulting Publication

*Gegenbauer et al. Regulator of G-protein signalling 18 integrates activating and inhibitory signalling in platelets. Prepublished online as Blood First Edition paper, Jan 10 2012; DOI 10.1182/blood-2011-11-390369*

'The flow cytometry core has been very helpful in all aspects of the project, including the experimental setup, optimisation of measurements and data evaluation. This support has led to the successful generation of very clear and important new data.'

**Dr Albert Smolenski**
*UCD*

CORE TECHNOLOGY:

# FLOW CYTOMETRY

**OUR EXPERTISE:**

Offering flow cytometry solutions to academic and commercial clients in a customisable range of services at each stage of the research pathway; from experimental design to final publication.

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**Register your interest here:**
**http://conway.ucd.ie/coretech**