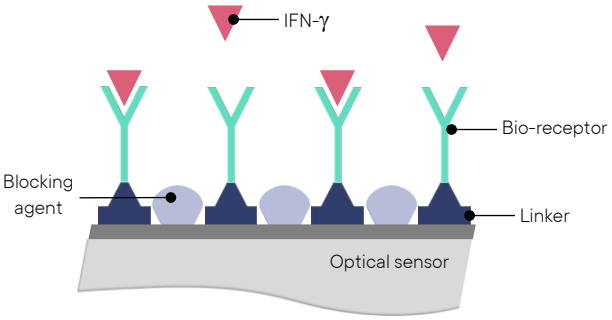
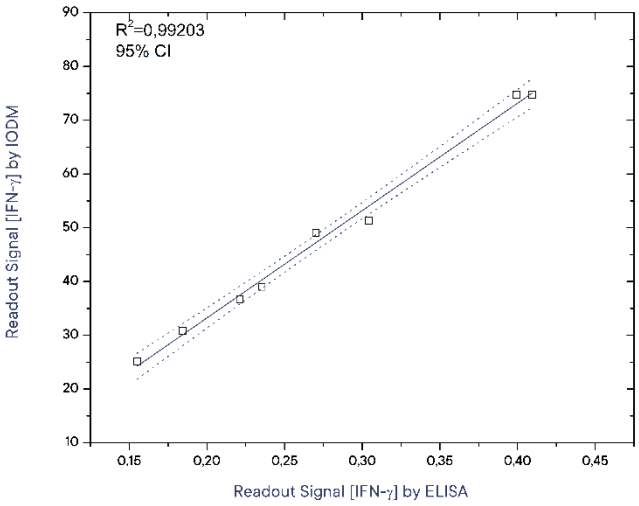
Interferon gamma (IFN-γ) in serum

Interferon gamma (IFN-γ), also called immune or type II interferon, is a type of cytokine produced by lymphocytes T CD4+ and natural killer (NK) whose most important function is the activation of macrophages. It can act as a biomarker of colorectal cancer.





Detection of IFN-γ with IODM (Interferometric Optical Detection Method) is highly correlated with results obtained from ELISA

Characteristic	IOMD	ELISA
Sample volume	3µL	50µL
Chemical developer	No	Yes
# Recognition steps	1	4

Other examples

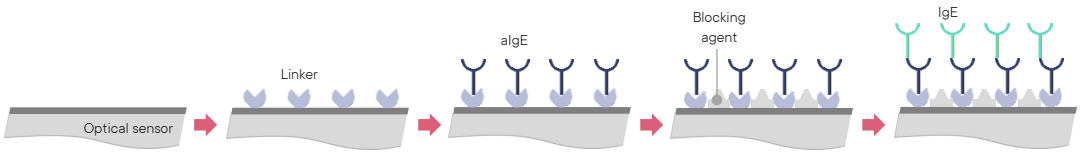
We have successfully tested this methodology also with infectious diseases such as rotavirus, dengue and influenza.

In-Vitro Detection (IVD)

biod
Bio Optical Detection

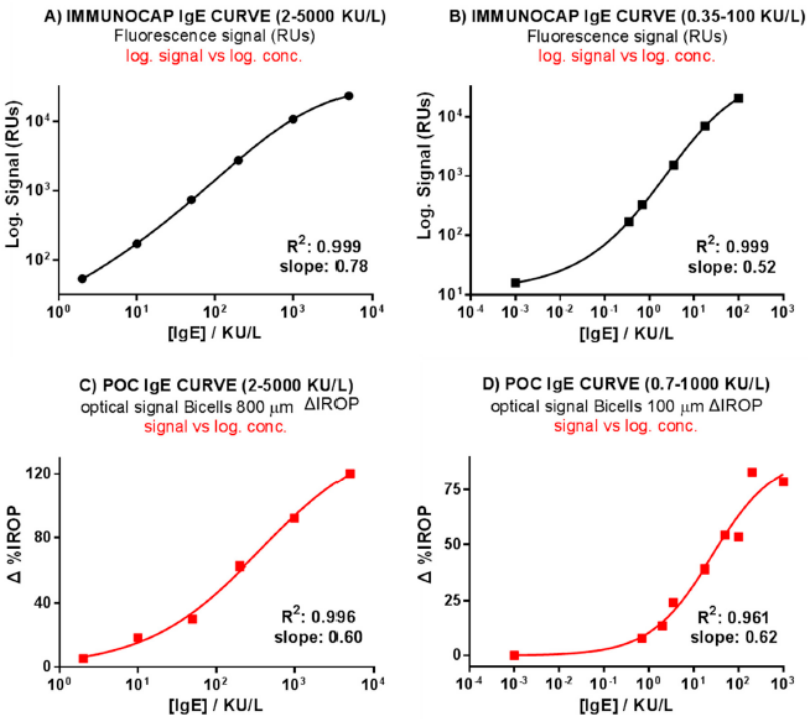
Food allergies (Anti-IgE/IgE)

Food allergy is a common disease worldwide with over 6%of the population (200–250million people) suffering from any food allergy nowadays. Immunoglobulin type E (IgE) biomarker determination in human serum is a typical in-vitro test for allergy identification. We developed an oriented immunoassay model based on the pair anti-IgE/ IgE to evaluate the standard calibrations in our system and compare it with ImmunoCAP, which is considered the gold standard diagnostic technique for food allergies. The versatility of our biosensors was demonstrated since their limit of detections and ImmunoCAP were 0.7 and 0.35 kU/L, respectively.



Advantages

- **Multiplexing**: Detect and analyze several assays in parallel
- **Time saving**: Less than 5 minutes detection time for most assays.
- **Low sample**: Only 2-3 µL of post-treated sample required per sensing unit.
- **Real time**: Results available immediately after testing.
- **Versatile**: Our technology allows for a wide scope of analyte and sample types.
- **Easy to operate**: Simple pre-treatment of samples. No need to perform periodic calibrations.



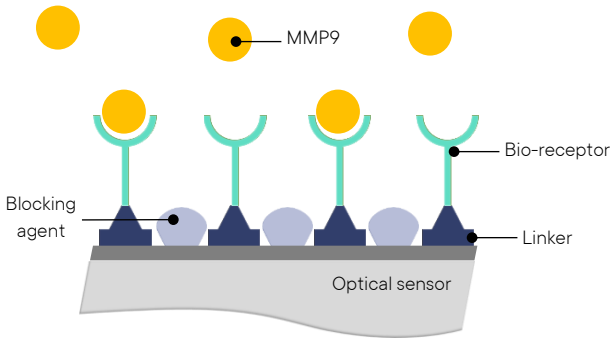
ImmunoCAP® and biosensor calibration curves. *A) ImmunoCAP® curve, range 2-5000 kU/L, B) ImmunoCAP® curve, range 0.35-100 kU/L. C) Biochip curve, range 2-5000 kU/L (reader platform signal). D) Biochip curve, range 0.7-1000 kU/L (reader platform signal)*

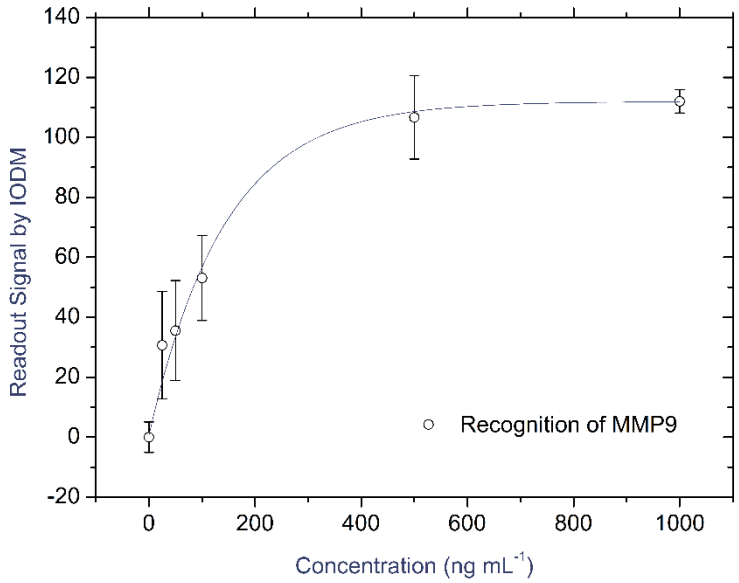
Other examples

We have successfully tested this methodology also with infectious diseases such as rotavirus, dengue and influenza.

Dry eye syndrome (MMP9)

Dry eye syndrome (DES) causes irritation, stinging, redness, and fatigue, among others—early detection and treatment being essential for the prevention of eye damage. In this term, metalloproteinase (MMP9) is one of the most relevant biomarkers being validated to dry eye diagnosis. However, despite the promising accurate diagnosis that can be obtained from these biomarkers, in-situ diagnostics needs quantitative results by using a limited volume of tear sample. We report the recognition curve for pure recombinant MMP9, tests of model tears with MMP9, and real tear performance from patients, with a promising limit of detection.





Recognition of MMP9: wavenumber shift monitored in function of concentration

Other examples

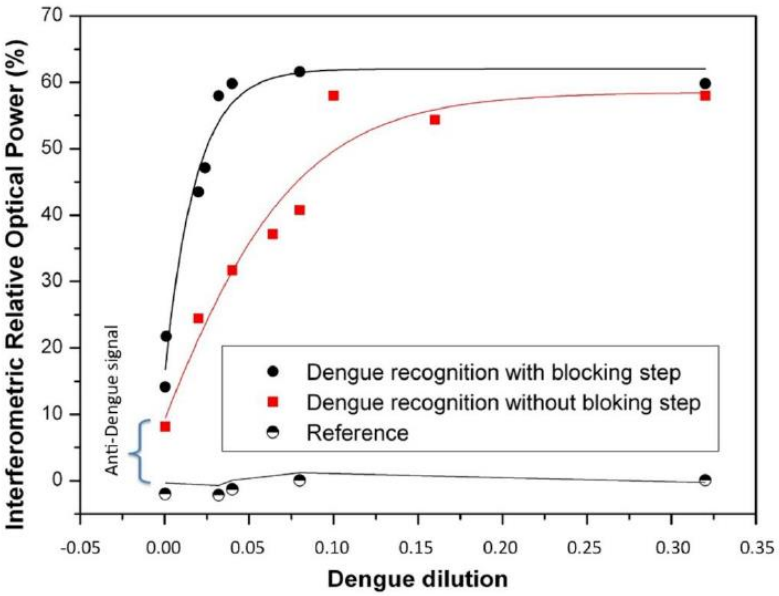
We have successfully tested this methodology also with food allergies and infectious diseases such as rotavirus, dengue and influenza.

In-Vitro Detection (IVD)

biod
Bio Optical Detection

Dengue

Dengue is an endemic viral disease affecting the human population in tropical and subtropical regions around the world. There are more than 50 million new infections annually, with a number of deaths ranging between 20,000 and 25,000, mainly in children. Currently, ELISA tests are available for qualitative or semi-quantitative measurement of dengue virus, but a significant amount of antibodies/ reagents is required. We have developed an efficient, reliable label-free test method, that is much more cost-effective. We also demonstrate how we can optimize this sensing response by adding a blocking step able to significantly enhance the optical sensing response.



Comparison of sensing curves for dengue recognition with and without blocking step, where the skim milk reagent significantly improves the biosensing response

Advantages

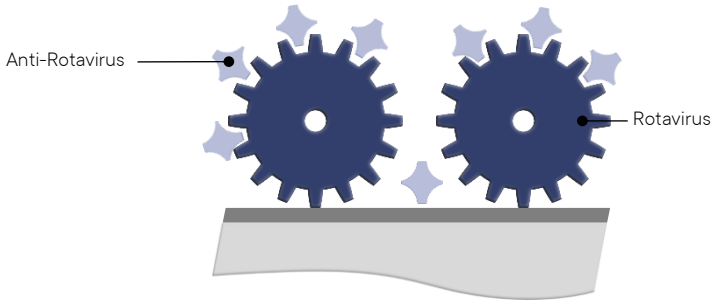
- **Multiplexing**: Detect and analyze several assays in parallel
- **Time saving**: Less than 5 minutes detection time for most assays.
- **Low sample**: Only 2-3 µL of post-treated sample required per sensing unit.
- **Real time**: Results available immediately after testing.
- **Versatile**: Our technology allows for a wide scope of analyte and sample types.
- **Easy to operate**: Simple pre-treatment of samples. No need to perform periodic calibrations.

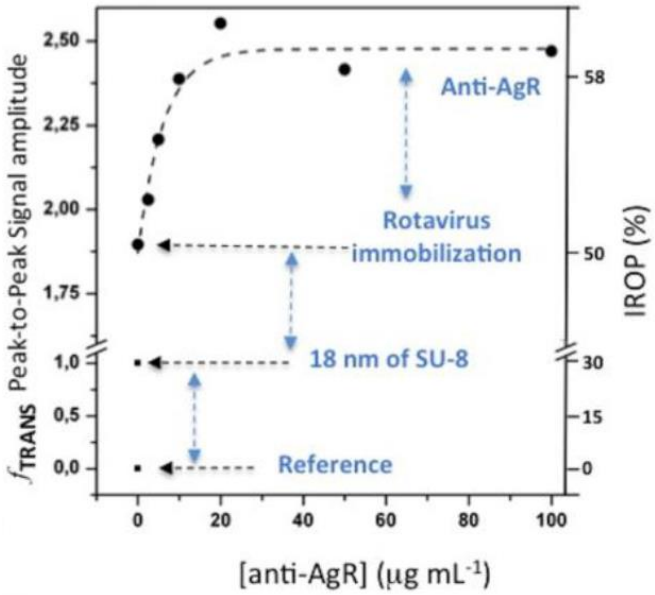
Other examples

We have successfully tested this methodology also with food allergies, dry eye syndrome and other infectious diseases such as rotavirus and influenza.

Rotavirus (Anti-AgR/AgR)

Rotavirus is the most severe infectious agent of diarrheal disease among infants and young children. Nearly every child in the world is infected with a rotavirus at least once by the age of five. With our read-out IODM based on IROP, we can recognize the rotavirus antybody, achieving competitive limit of detection figures.





Biosensing response for anti-AgR recognition. *Analyzing the anti-Rotavirus biosensing curve, we can obtain an experimental sensitivity of* m_{IODM} *= 0.9% of IROP per each* $\mu g \cdot mL^{-1}$ *of anti-AgR. The limit of detection for this immunoassay is calculated in a value of 18.2* $ng \cdot mL^{-1}$.

Other examples

We have successfully tested this methodology also with food allergies, dry eye syndrome and other infectious diseases such as dengue and influenza.