Plasora
A Quantum Leap in Plasmonic Sensing

The Æon Core™ Open Plasmonic Platform

What it can detect and how it outperforms today's sensing technologies

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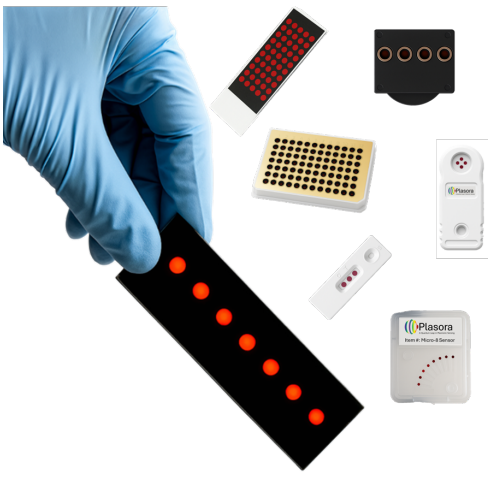
The Æon Core condenses over a decade of frontier plasmonics research into a compact, manufacturable chip. Drawing on advances in physics, materials science, optics and engineering, and evolved over years of well protected development and know-how, the Æon chip delivers unparalleled sensing performance across a plethora of detection applications including rapid, high-sensitivity and quantitative scalable modes. Where conventional detection systems (e.g. ELISA, SPR/LSPR or colorimetric assays) force trade-offs between sensitivity, complexity and cost, the Æon Core is designed to give you:

- **Higher sensitivity** — hybridised plasmonic modes sharpen resonances and hotspots, enabling exceedingly low Limits of Detection (LODs).
- **Cleaner, more reliable data** — adaptive optics or other signal capture systems enable quantitative readouts, even in challenging, dynamic matrices.
- **Open, modular integration** — reference designs and open data make it possible to plug the Æon chip into existing optical or electrochemical immuno-based systems.
- **Scalable manufacturing** — patented thin-film manufacturing processes with angstrom-level control ensure reproducible performance from prototype to production.

This document offers a high-level overview of what the Æon Core can detect, several modalities it supports, and where it fits compared with current technologies.

What types of targets can an Æon Core plasmonic system detect?



In short: anything you can capture or generate at the surface

Æon Core–based systems are deliberately agnostic to the specific recognition chemistry. If you can design a capture layer, competitive assay or signal-generating reaction at the chip surface, the sensor can, in principle, detect it.

Below is a non-exhaustive overview of target classes that can be monitored using Æon Core chips.

Pathogens and whole bio-particles

- Bacteria
- Viruses
- Bacteriophages
- Fungi and yeast
- Parasites
- Other whole particles (e.g. virus-like particles, engineered vesicles)

Typical recognition elements include antibodies, phage, aptamers, receptor proteins or engineered binding domains immobilised on the chip.

Toxins & hazardous agents

- Bacterial, fungal and plant toxins
- Environmental and marine toxins
- Engineered or synthetic toxicants where suitable affinity reagents exist

Assays can be direct (capture on the surface) or indirect (e.g. competitive binding, reporter generation).

Proteins & biomarkers

- Diagnostic protein biomarkers (cardiac, cancer, inflammatory and hormonal markers)
- Enzymes and their activity (binding or catalytic readouts)
- Antibodies (e.g. serology, autoantibodies)
- Cytokine panels / multiplex inflammatory signatures

Æon Core architectures are ameanable to multiplexed, low-volume immunoassays that would be challenging to scale with traditional ELISA or SPR.

Nucleic acids

- DNA / RNA sequences (pathogens, SNPs, oncology targets)
- MicroRNAs and other small RNAs
- Amplified products from PCR, LAMP, RPA and related methods

The chip's extreme surface-sensitivity allows both label-free hybridisation assays and label-based readouts (e.g. nanoparticle tags, enzymatic precipitation) to be detected with high signal-to-noise.

Small molecules & metabolites

- Metabolites (e.g. glucose, lactate, urea)
- Vitamins and cofactors
- Neurotransmitters and other bioactive small molecules

Many of these are traditionally "hard" targets for optical platforms. Æon Core chips support competitive and sandwich-style chemistries that bring small-molecule sensitivity into a regime normally associated with larger analytes.

Cells, particles & complex structures

- Mammalian and microbial cells captured via affinity ligands
- Cell surface receptor engagement and binding kinetics
- Platelets, red and white cell subsets, extracellular vesicles

By combining high sensitivity with spatially structured fields, the Æon Core can resolve subtle binding or morphological changes that conventional imaging or bulk optical methods miss.

Complex matrices & application spaces

The platform is designed to operate in real-world samples, not just clean buffers:

- **Clinical:** blood, serum, plasma, saliva, urine, CSF, tears
- **Food & beverage:** milk, juices, washes, grains, oils
- **Environmental:** drinking water, wastewater, soil extracts, air filters
- **Bioprocessing:** culture media, fermentation broths, bioreactors

In each case, the "target" is whatever the surface chemistry is designed to capture. The Æon Core is agnostic to the analyte class – its job is to turn surface events into strong, reliable optical signals.

How does the Æon Core compare to existing technologies?

Compared with conventional SPR / LSPR

- Sharper, stronger resonances via hybridised modes and engineered hotspots — higher sensitivity and lower limits of detection.
- More compact optics — no moving prisms or delicate alignment; easier to integrate into benchtop, portable or even smartphone-coupled devices.
- Greater flexibility in assay design — supports digital, colorimetric, spectroscopic and electrochemical readouts from the same underlying chip architecture.

Compared with ELISA and colorimetric assays

- Far lower sample and reagent volumes, with comparable or better sensitivity.
- Faster time-to-answer (especially in digital / single-particle modes).
- Easier multiplexing without complex plate layouts or multiple wash steps.

Detection architectures supported by Æon Core chips

Æon Core chips are intentionally designed to interface with a broad range of readout systems, allowing you to match the detection architecture to your application, budget and regulatory environment.

Below is a non-exhaustive list of compatible approaches:

Digital plasmonic sensing

- Converts analogue chip signals into precise digital events, enabling ultra-sensitive assays with clear statistical behaviour.

Spectroscopic sensing

- Analyses wavelength-dependent absorption or scattering to quantify shifts in plasmonic resonances. Well-suited to labelled or label-free binding curves, kinetic characterisation and multi-wavelength assays.

Compared with bespoke nanostructured sensors

- Manufacturable at scale using thin-film processes with ångström-level control.
- Standardised, open reference designs rather than one-off nanofabrication recipes.
- Material-agnostic surfaces that can be tuned to different metals, coatings or functional layers as required.

Visual / colorimetric sensing

- Uses colour changes visible to the human eye or simple cameras. This enables low-cost, field-deployable tests and lateral-flow-style formats without sacrificing underlying plasmonic performance.

Electrochemical sensing

- Combines the plasmonic chip with electrochemical readouts (current, voltage, impedance), turning the Æon Core into a high-performance working electrode for advanced electroanalytical assays or hybrid optical–electrochemical platforms.

Raman & SERS sensing

- Harnesses local field enhancement to boost Raman / SERS signals, enabling molecularly specific detection in compact, integrated devices.

Why adopt the Æon Core open platform?

If your current assays are inhibited by low sensitivity, complex optics or rigid workflows, the Æon Core offers a different path:

- **Sensitivity without the hassle** — rapidly detect trace signals at the point of need.
- **Simpler workflows** — run sophisticated studies without specialist infrastructure.
- **Resource efficiency** — iterate faster using less sample and fewer reagents.
- **Open & modular** — adopt and adapt the platform to your own systems and materials.
- **Field-ready** — anti-fouling design and robust signals for real-world environments.
- **Reproducible at scale** — built from the ground up for manufacturing and QA.

If you see potential in the Æon Core, let's have a conversation. We regularly advise research teams, startups and industrial partners on assay development, hardware integration and scaling strategies. Reach out today to explore compatibility, request performance details, or discuss a proof-of-concept programme for your target analytes.

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