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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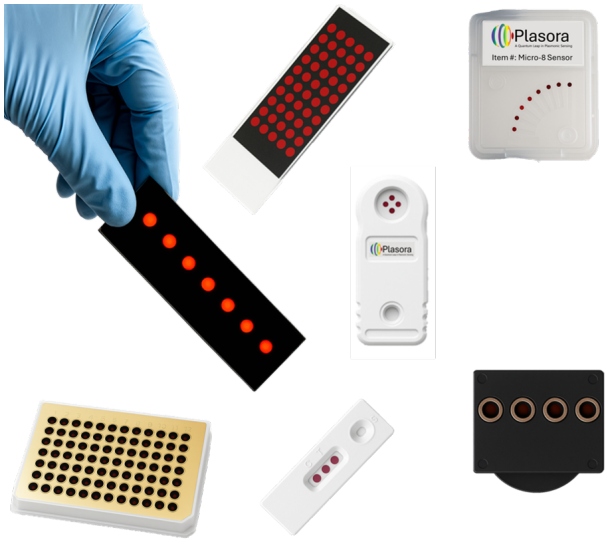
The Æon Core condenses over a decade of frontier plasmonics into a compact, manufacturable chip. Built on advances in physics, materials, optics, and engineering, and refined through protected development and know how, it delivers high sensitivity, quantitative performance, and rapid time to answer across diverse detection applications. Where conventional systems (ELISA, SPR/LSPR, colorimetry) force tradeoffs between sensitivity, complexity, and cost, Æon is designed to give you:

- **Higher sensitivity** — hybridised plasmonic modes sharpen resonances and hotspots, enabling exceedingly low Limits of Detection.
- **Cleaner, more reliable data** — Adaptive signal capture enables quantitative readouts, even in dynamic, fouling matrices.
- **Open, modular integration** — Reference designs and open data support plug in with optical, electrochemical, and immuno-based systems.
- **Scalable manufacturing** — Patented thin film processes with angstrom level control ensure reproducible performance from prototype to production.

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



In short: anything you can capture or generate at the surface. Æon systems are agnostic to recognition chemistry. If you can design a capture layer, competitive assay, or signal generating reaction at the chip interface, the sensor can, in principle, detect it.

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 every case, the "target" is whatever the surface chemistry captures. The Æon Core converts surface events into strong, reliable signals.

How does the Æon Core compare to existing technologies?

Compared with conventional systems

- **Sensitivity:** Sharper resonances via hybridized modes and engineered hotspots produce lower limits of detection.
- **Assay flexibility:** Supports digital, colorimetric/visual, spectroscopic, and electrochemical readouts on one core architecture.
- **Deployment speed:** No moving parts or delicate alignments; integrates into benchtop, portable/handheld, or smartphone coupled modules.

Compared with ELISA and colorimetric assays

- **Volume:** Far lower sample and reagent use with comparable or better sensitivity.
- **Speed:** Faster time to answer, especially in digital/single particle modes.
- **Multiplexing:** Easier to multiplex without complex plate layouts or multiple wash steps.

Compared with bespoke nanostructured sensors

- **Manufacturability:** Scalable thin film processes with angstrom level control.
- **Standardization:** Open, referenceable designs rather than one off recipes.
- **Materials flexibility:** Tunable metal stacks, coatings, and functional layers as needed.

Detection architectures supported by Æon Core chips

Æon chips plug into a broad range of monitoring systems. Below is a partial list of compatible approaches:

Spectroscopic sensing

- Wavelength dependent absorption/scattering quantify plasmon shifts; suited to label free/labelled binding curves, kinetics, multi wavelength assays.

• **Digital plasmonic sensing**

- Converts analogue signals into discrete digital events for ultra sensitive assays with clear statistical behavior.

Visual / colorimetric sensing

- Human visible or camera detectable color changes for low cost, field deployable tests and lateral flow style formats without sacrificing plasmonic performance.

Electrochemical sensing

- Integrates optical and electrochemical readouts (current, voltage, impedance), turning the chip into a high performance working electrode or hybrid platform.

Raman & SERS sensing

- Local field enhancement boosts Raman/SERS signals for molecular specificity in compact, integrated devices.

Why adopt the open-source Æon Core Chip?

If speed, sensitivity, infrastructure burden, or rigid workflows limit your assays, Æon offers a **powerfully different path:**

- **Sensitivity without the hassle:** Rapidly detect trace signals at the point of need.
- **Simpler workflows:** Run sophisticated studies without cumbersome infrastructure.
- **Resource efficiency:** Iterate faster with less sample and fewer reagents.
- **Open & modular:** Integrate into your systems and materials, with reference designs and open data.
- **Field-ready:** Anti fouling design and robust signals for real world environments.
- **Reproducible at scale:** Built for manufacturing and QA from the ground up.

If these possibilities spark your interest, we're glad to connect and share details.

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