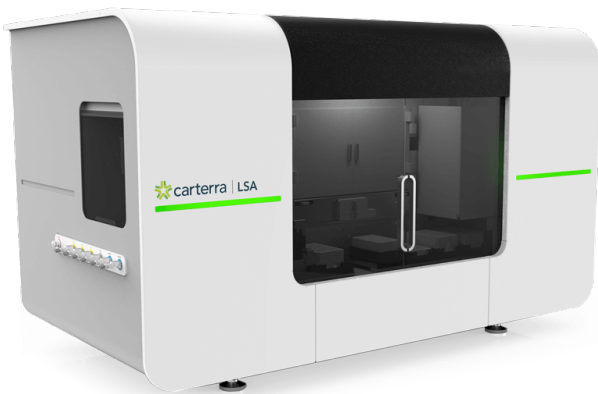




# Drug Discovery: Carterra® LSA Platform Accelerates Lifesaving Antibody Drug Development

Carterra® is a leading provider of pharmaceutical R&D instruments that accelerate the discovery of novel therapeutic antibody candidates.

Carterra's founder and leaders of engineering and research contacted Optikos with a revolutionary idea that would dramatically improve the efficiency of antibody screening for pharmaceutical companies. Their vision was a fully integrated, screening and characterization platform that would combine their patented flow printing microfluidics with real-time high-throughput surface plasmon resonance (HT-SPR) optical detection. This system coupled with one-of-a-kind software capabilities, if successful, would deliver many times the data in a fraction of the time, with minuscule sample requirements and lower consumable costs than existing systems.



Realizing this vision would require a detection module comprising dynamic illumination and flow cell array imaging. The specifications of these optical systems must be tailored for the array geometry and the biomolecular reactions intended to be characterized. With no commercially available detection systems meeting these requirements, a custom design was needed.

Carterra came to Optikos with a breadboard optical system that demonstrated feasibility of the detection technique. Optikos was tasked with developing it into a high-performance, repeatable, and manufacturable module integrated with the surrounding LSA system. Our team worked closely with the Carterra R&D group to learn their platform, inside and out, in order to design an opto-electronic system married to their patented flow cell technology.

The system we designed required precision illumination and a high-resolution, large-field imager to visualize the sample

chip. All these technologies enabled the LSA Platform to monitor 384 parallel interactions in real-time—ultimately delivering nearly 100x the data of older, competitive technologies in 10% of the time (1,000x the throughput), requiring just 1% of the sample.

According to Chris Morrow, Carterra's Director of Engineering, "The Optikos team was hands-on in this process from design to production and their engineering expertise proved critical in the ultimate success of the LSA Platform."

Once the design was finalized, prototyped, and verified, Optikos undertook pilot production. The Optikos team worked with Carterra production engineers to ensure that the manufacture of this highly accurate SPR sensor could

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be seamlessly moved to their own facility. Our team trained the client's technicians and worked alongside their manufacturing group to ensure a smooth transfer of materials, processes, and knowledge in the transition to higher volume production.

The Optikos engineering team continues to work as an extension of the Carterra R&D group on new designs that set the LSA Platform performance bar even higher for speed and quality.

*\*The Netflix documentary, "Pandemic: How to Prevent an Outbreak," produced by Dr. Ryan McGarry in 2019, highlights research and development of a universal vaccine that would be effective against all influenza viruses. DistributedBio Principal Scientist, Sarah Ives, describes the company's work in developing a universal vaccine, showing antibodies being tested in the Carterra® LSA Platform in Episode 1 of the documentary.*