

CASE STUDY

# AKOYA CODEX™

## Transforming Research in Disease and Therapeutic Responses With a Comprehensive End-to-end Solution for Multiplexed Immunofluorescence

*Automating the analysis of highly multiplexed biomarkers.*

### ▶ The Problem

In cancer treatment, the characterization of a tumor microenvironment is crucial to understanding the molecular and cellular mechanisms driving disease and therapeutic responses. Akoya Biosciences developed a manual laboratory process to provide a comprehensive solution for spatially resolved, highly multiplexed biomarker analysis, but needed a partner to help automate the process and make it suitable for commercial production.

### ▶ The Background

Born out of Stanford University, CODEX (CO-Detection by indEXing) technology was part of a decade long quest to make improvements to biomarker detection in cancer research. Existing methods were manual systems that took 1-2 weeks to measure multiple biomarkers at a relatively low level of quality. CODEX wanted to enable better results within one day or less. Akoya needed a partner to lead the design and development of an instrument that could automate their novel technology. Veranex's expertise in instrument development including workflow automation, fluidics, and manufacturing made for a strong partnership to help Akoya commercialize CODEX.





## ► Innovation Opportunity

CODEX offers a cost-effective means to transform customers' existing fluorescence microscopes into ultra-high-parameter tissue imaging systems. Users can simultaneously analyze more than 40 protein markers for spatially resolved tissue characterization with single-cell resolution in multiple sample types. The system offers the flexibility to design custom panels using a combination of Akoya-validated, ready-to-use antibodies and customers' antibodies of interest. Veranex's experienced development team led the rapid development of Early Access Units shipped to carefully selected research labs. These early adopters tested the instruments, evaluated their performance, and provided critical feedback that was incorporated into the commercial units, which were concurrently under development. In addition, these EAU customers were among the first to publish the research results enabled by CODEX technology. Commercial production of CODEX began in January 2019, only two years after initiating the instrument development with Veranex.

## Veranex Skills Used

- Industrial design and human factors
- Workflow automation
- Robotics and motion control
- Fluidic control and reagent management
- Design for manufacturability
- Transfer to commercial manufacturing





## ▶ Value Delivered

Veranex led the development of a fully automated instrument, from concept through prototyping and commercial manufacturing. While Akoya focused on their core technology and algorithms, Veranex's team managed the complexities of design, mechanical and systems integration, automation, and design for manufacturing.

Veranex continues to manufacture units for Akoya's clients as a long-term partner.

## ABOUT VERANEX

Veranex is the only truly comprehensive, global, tech-enabled service provider dedicated to the medical technology industry. Offering expert guidance from concept through to commercialization and across the development continuum, Veranex enables accelerated speed to market, controlled development costs, development risk mitigation, and accelerated market viability assessment.

At every stage, Veranex customers realize efficiencies in cost and time, while our integrated and comprehensive solutions unify the entire development process. With Veranex as your end-to-end partner, you're well-positioned to deliver the safest, most effective devices to improve outcomes to patients everywhere.



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