

Ashish V. Jagtiani, Ph.D.

Diagnostic instruments & biosensors · Co-founder

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Engineer and founder with twenty years in diagnostics, biosensing, and microfluidics — reading biology electrically, from multiplexed Coulter counters through semiconductor biosensors to a whole-blood CBC/CMP cartridge. Took an in-vitro diagnostic from concept through IRB-approved clinical study and FDA pre-submission as co-founder and CTO, leading a 20-plus-person cross-functional team and supporting \$28M+ in venture funding. Six issued US patents; 30+ peer-reviewed publications.

EXPERIENCE

Co-founder & Partner Twenty Seven Labs — Hayward, CA 2025 – Present

- Diagnostics and biosensor studio serving startups, labs, and investors: assay development, sensor platforms, cartridge and instrument design, and technical due diligence.
- Hands-on bench work in BSL-2 chemistry and instrumentation labs alongside system design and commercialization strategy.

Co-founder & Chief Technology Officer Chronus Health — San Francisco, CA 2017 – 2024

- Led technical vision and execution for a point-of-care blood testing platform: a low-COGS single-use cartridge delivering complete blood count (CBC) and comprehensive metabolic panel (CMP) from undiluted whole blood, with no optics and no sample preparation.
- Pioneered label-free, reagent-free multimodal sensing — whole-cell impedance spectroscopy for cells, aptamer-based amperometry for proteins, and ionophore-doped ion-selective electrodes for electrolytes; 13 analyte targets on proprietary aptamer sequences.
- Validated against commercial hematology and chemistry analyzers in a 25-volunteer IRB-approved study: correlation to $r = 0.96$ (CBC), $r = 0.96$ (CMP), and $r^2 > 0.99$ (electrolytes).
- Directed a 20+ member cross-functional team across assay development, microfluidics, hardware, and software, plus contractors and vendors; built internal lab and pilot production infrastructure.
- Designed a custom 4-channel lock-in amplifier in-house at under \$2k against a \$40k+ commercial equivalent; drove cartridge design and automation toward a \$0.80 COGS target at 25M units/yr.
- Key contributor to \$28M+ in venture funding, leading technical due diligence and investor communications; developed FDA pre-submission and CLIA waiver regulatory strategy.

Research Scientist / Sr. Materials Process Engineer IBM T.J. Watson Research Center, NY 2011 – 2017

- Developed reactive ion etching (RIE) processes for next-generation semiconductor devices on 200 mm wafers in the Plasma Physics and Materials Research Labs; advanced integration of complex materials at nanoscale.
- Enabled semiconductor–microfluidic integration for molecular-level protein detection on the Exploratory Devices Team; contributed to the KACST–IBM Nanotechnology Center of Excellence.
- Co-inventor on issued patents covering field-effect, capacitive, and extended-gate biosensors and selective dry etch for directed self-assembly.

EDUCATION

Ph.D., Mechanical Engineering The University of Akron, Ohio 2008 – 2011

Dissertation: Multiplexed Microfluidic Multichannel Coulter Counters for High-Throughput Detection of Bio-Objects

M.S., Mechanical Engineering The University of Akron, Ohio 2004 – 2007

Research: Multichannel resistive pulse sensors for micro-particle detection

B.E., Biomedical Engineering Thadomal Shahani Eng. College, University of Mumbai 1999 – 2003

ISSUED US PATENTS

US 11,400,452	Devices, Cartridges, and Sensors for Analyzing a Biological Sample	Chronus Health, 2022
US 10,105,082	Metal-Oxide-Semiconductor Capacitor Based Sensor	IBM, 2018
US 10,043,668	Selective Dry Etch for Directed Self-Assembly of Block Copolymers	IBM, 2018
US 9,201,041	Extended Gate Sensor for pH Sensing	GlobalFoundries, 2015
US 9,110,014	Field Effect Transistor-Based Bio-Sensor	IBM, 2015
US 9,103,770	Determination of Isoelectric Points of Biomolecules Using Capacitive Sensors	IBM, 2015

Four further applications pending (whole-blood impedance, potentiometric and amperometric sensing; aptamer-based albumin detection).

SELECTED PUBLICATIONS

Zafar, S., Lu, M., **Jagtiani, A.** (2017). Comparison between field effect transistors and bipolar junction transistors as transducers in electrochemical sensors. *Nature Scientific Reports*. doi:10.1038/srep41430

Jagtiani, A. V., Miyazoe, H., Chang, J., Farmer, D. B., Engel, M., et al. (2016). Initial evaluation and comparison of plasma damage to atomic layer carbon materials. *J. Vac. Sci. Technol. A*, 34(1), 01B103. — *JVSTA Editor's Pick*; *AVS "Beneath the Surface" feature*

Jagtiani, A. V., Zhe, J. (2013). High throughput microfluidic electrical impedance flow cytometry for assay of micro particles. *Micro & Nanosystems*. — *Invited review; most-accessed article*

Jagtiani, A. V., Carletta, J., Zhe, J. (2011). An impedimetric approach for accurate particle sizing using a micro Coulter counter. *J. Micromech. Microeng.*, 21, 045036.

Jagtiani, A. V., Zhe, J., Carletta, J. (2011). A microfluidic multichannel resistive pulse sensor using frequency division multiplexing for high throughput counting of micro particles. *J. Micromech. Microeng.*, 21, 065004.

Murali, S., Xia, X., **Jagtiani, A. V.**, Carletta, J., Zhe, J. (2009). Capacitive Coulter counting: detection of metal wear particles in lubricant using a microfluidic device. *Smart Materials and Structures*, 18. — *IOP 2009 Highlights of the Year*

Full list — 15+ journal articles and 18+ conference papers — at ashishvjagtiani.com/publications and Google Scholar.

SELECTED EXPERTISE

- Electrochemical & impedance biosensors (FET, capacitive, amperometric, potentiometric)
- Assay development, aptamer selection, surface chemistry
- Micro/nanofabrication: RIE, directed self-assembly, glass & Si processing
- Design for manufacture and COGS reduction at scale
- Microfluidics, lab-on-a-chip, disposable cartridge design
- Instrumentation: analog front-ends, lock-in detection
- IVD product development, FDA pre-submission, CLIA waiver pathway
- Technical due diligence, R&D leadership, cross-functional teams