*Curriculum Vitae*

# Christopher Matthew Byrd, Ph.D.

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## *Summary:*

Senior scientist and executive with extensive organizational leadership, strategic planning, academic, and program management experience. Expertise in forensic biotechnology, chemistry, and life science research and development efforts, ventures, and processes. ANSI/ANAB, College of American Pathologists (CAP), and FBI-qualified laboratory assessor. Areas of focus:

- Biotechnology/Bioengineering
- Life Sciences
- Chemistry/Biology
- Program Management
- Government/Department of Defense
- Strategic Analysis
- Research and Development
- Interdisciplinary Research

## *Education:*

University of Maryland — College Park, MD
**Ph.D., Bioengineering**, 2011
Dissertation Title: *Local and Global Gene Regulation Analysis of the Autoinducer-2 Mediated Quorum Sensing Mechanism in Escherichia coli*

University of Central Florida — Orlando, FL
**B.S., Design Engineering**, 1995

## *Professional Experience:*

*$B^2$ Consulting Group* — Bethesda, MD
**Managing Director/Chief Scientist** — 12/2016-Present

- Biology Subject Matter Expert consultant for the Defense Threat Reduction Agency (DTRA) in various bioscience research efforts (details classified).
- Associate Director of the Joint Research Laboratory and Principal Faculty at the University of Maryland (UMD), managing a $20M+ research portfolio of collaborative rapid-prototype research and development between UMD and Army Research Laboratory scientists and investigators.
- Provide guidance and direct oversight on immunoengineered approaches for cancer (oncology) research to laboratories within George Washington University Cancer Center and collaborate with the Genomics Core on Next Generation DNA and protein sequencing processes.
- Provide graduate level instruction in Biopharmaceutical Engineering as adjunct professor at the University of Maryland (BIOE658L). Areas of focus include vaccine development, biodetection platforms, DNA analysis and biostatistics, cell and gene therapies, genetic engineering, bioreactors, and upstream and downstream production of pharmaceuticals.
- Provide research plan, quality assurance (QA) and feasibility review and consultation for bioscience Small Business Innovation Research (SBIR) proposals to the National Institutes of

Health, including research plan feasibility, research team and innovation review, animal testing protocols, and human subject protections.

- Perform Expert witness consultation for cases (criminal and family law) involving DNA forensic analysis, biochemistry, and life sciences expertise, among other areas.
- Lead organizational training development and strategic system enhancement for the Commonwealth of Virginia on scientific and technical education and career pathways for Veterans.

*United States Military Academy at West Point* — West Point, NY
**Deputy Director**, Center for Molecular Sciences, USMA — 07/2014-12/2016
**Assistant Professor**, Department of Chemistry and Life Science

- Coordinate and enhance strategic partners for research collaborations and funding opportunities within the Center for Molecular Sciences and the Department of Chemistry and Life Sciences.
- Perform laboratory accreditation reviews for 14 laboratories within the department, updating standards, operating procedures, and guidelines, and orchestrate the installation, training, and adoption of a novel laboratory information management system (LIMS).
- Manage and oversee all research programs in the Department and provide instruction to all levels of undergraduate student in Chemistry, Biology, Biochemistry, and Bioengineering courses.
- Promote and cultivate collaborations between the Academy and the extended Army research community as well as sister service, academia, and governmental research organizations.

*Office of the Chief of Staff of the Army* — Pentagon, VA
**Science and Technology Lead / Military Fellow** — 07/2013-06/2014

- Directly advise the highest-ranking general officer in the U.S. Army on a highly diverse set of topics including strategy development, policy analysis, science and technology plans and programs, disruptive technologies, and more.
- Lead the Science and Technology Research Team, ascertaining global and strategic challenges facing the Department of Defense and the U.S. Army over the next 20+ years and recommending tangible and actionable courses of action to optimize outcomes.

*U.S. Army Research Laboratory (ARL)* — Adelphi, MD
**Director of Biosciences** — 07/2012–06/2013

- Moderate the ARL biosciences prospect and research function, coordinating and reviewing all basic and advanced biological research programs valued in excess of $35M.
- Work closely with developmental leads as a partner in helping to achieve research goals, incorporating organizational goals with the Defense Laboratory Network Joint Science and Technology Office strategy.
- Augment ARL Chief Scientist in multiple arenas including international relations and Department of Defense Laboratory Commanders' assemblies.

*401st Army Field Support Brigade* Afghanistan
**Deputy Director**, Acquisition, Logistics, and Technology Directorate 06/2011–06/2012

- Direct, coordinate and support the battlefield delivery, training, and employment of all Program/Product managers and their personnel throughout Afghanistan, including approximately 70 different systems and technologies valued at over $10 billion and 4,000 support representatives.
- Supervise and perform forensic analysis at the Combined Exploitation Cell analytical laboratory in Bagram, Afghanistan, using DNA samples to perform human suspect identification for use in the criminal justice system in country.
- Advise the commander of all U.S. forces in Afghanistan on filling critical operational and strategic technological capability gaps, increasing maneuverability, operability and safety for nearly 100,000 soldiers as well as Coalition partners.

*U.S. Army Research Laboratory* Adelphi, MD
**Team Leader**, Chemical and Biological Detection 07/2009–06/2011

- Design and lead biological engineering research focused on understanding the genetic mechanisms involved in bacterial proliferation and sudden changes in pathogenicity based upon local population of cells (Quorum Sensing).
- Lead the rapid delivery, training, and field support efforts in southern Afghanistan for BeachComber, a developmental explosives detection device program valued at over $24 million.
- Serve as liaison between the Army Research Laboratory, the Institute for Collaborative Biotechnologies (ICB), Defense Threat Reduction Agency (DTRA), Edgewood Chemical and Biological Center (ECBC), and the United States Military Academy (USMA) at West Point for the coordinated development of chemical and biological technologies.

## ***Sample of Professional Publications and Invited Talks**:*

"*Directed assembly of a bacterial quorum*", Servinsky M, Terrell J, Tsao CY, Wu HC, Quan D, Zargar A, Allen P, Byrd C, Sund C and Bentley W., The ISME Journal, 2015; doi:10.1038/ismej.2015

*"Transcriptional Regulation in the Divergent Quorum Sensing lsr Regulon in Escherichia coli",* CM Byrd, MD Servinsky, and WE Bentley, 2014, in review.

"*Construction of a Cell Based Sensor for the Detection of Autoinducer-2*" Servinsky M, Allen P, Tsao CY, Byrd C, Sund C, Bentley W, SPIE - Defense, Security, Sensing, 2012; doi:10.1117/12.977869.

"*Developing a Cell-Based Sensor for the Detection of Bacterial Contamination of Fuel*." Servinsky M, Allen P, Byrd C, Bentley WE, Sund C, Sumner J. (ARL DRI First-year Report) (U) - FY11 04/15/2012.

"*Microfluidic Electrochemical Sensor Array for Characterizing Protein Interactions with Various Functionalized Surfaces*" Dykstra PH, Roy V, Byrd CM, Bentley WE, Ghodssi R, Analytical Chemistry, 2011.

"*Local and Global Gene Regulation Analysis of the Autoinducer-2 Mediated Quorum Sensing Mechanism in Escherichia coli*", Byrd CM, Dissertation, DRUM, 2011. (http://hdl.handle.net/1903/11554)

"*Materiel Enterprise Integration and Transition during Surge Recovery in Afghanistan*" Byrd CM, AMC LogCAP Pubs, 2011.

"*Quieting cross talk--the quorum sensing regulator LsrR as a possible target for fighting bacterial infections*." Byrd CM, Bentley WE, Cell Research, 2009.

*Invited Talks and Posters*

H.C. Wu, C.Y. Tsao, M.D. Servinsky, B. Adams, C.M. Byrd, J.J. Sumner, J.J. Valdes, G.F. Payne and W.E. Bentley. "*Rewiring Quorum Sensing Signaling Yields Autonomous Localization and Actuation of Engineered Cells"*. Invited Presentation, Society for Industrial Microbiology 2011 Annual Meeting.

M.D. Servinsky, C.Y. Tsao, C.M. Byrd, W.E. Bentley. "*Detection of Microbial Induced Corrosion through Quorum Sensing"*. American Chemical Society General Meeting 2011.

M. D. Servinsky, J.T. Kiel, P. C. Allen, C.Y. Tsao, C.M. Byrd, C.J. Sund, W.E. Bentley. "*Enhancement of a Cell-based AI-2 Sensor*" 2011 DTRA CBD S&T.

***Testimony in the Last 4 Years:***

- USMC LCpl S. M. Swisher, General Court-Martial, US Marine Corps Recruit Depot Parris Island (Trial).
- Yolanda Bryant, Plaintiff v. Le Nails, LLC and Tuyet Thai Tran, Defendants, South Carolina, County of Spartanburg, C.A. # 19-CP-42-722 (Deposition).
- Orphans' Court, St. Mary's County, MD, Estate of Lloyd Almon Goble, Estate No. 19813 (Judge's Panel).
- Amanda Jackson v. Gary Deford, Ronnie Deford, Homer Deford, Casey Deford, Patricia Deford, Cause No. PR-21-00828-1, Probate Court of Dallas County, TX (Deposition).
- Estate of Terry Seybert v. Aaron Wise, Kalamazoo Probate Court, State of Michigan, LC No. 2020-000056-DE (Trial).
- State of Florida v. Victor Rios, Circuit Court of 20th Judicial Circuit, Collier County, Florida, Case 21-000199CF (Deposition and Trial)
- Commonwealth v. Rodney A. Hester, Stafford Circuit Court, Stafford, VA, Case CR20000858-00 (Trial)
- Commonwealth of Pennsylvania v. Taylor Nathan Atkinson, Washington County, PA, Docket Number CP-63-CR-0001231-2024 (Trial)

***Additional Information and Awards:***

- Bronze Star, Legion of Merit, Meritorious Service Medal (x4), Army Commendation Medal (x2), Army Achievement Medal (x2), various other service awards (1996-2016)
- Centralized Selection List command selectee (top 5% of Army officers) (2014)

- Winner of an Army Research Laboratory Director's Research Initiative award and funding for innovation in research (2011)
- Board selected for one of three positions in the U.S. Army Acquisitions Corps Uniformed Army Scientist and Engineer PhD Program (2006)
- Distinguished Honor graduate, TC Officer Basic Course (1996)