Volkan Kilinc, Ph.D.

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Professional Summary

Interdisciplinary Ph.D. Scientist with over 5 years of experience in research and development, specializing in DNA nanotechnology, materials science, and advanced sensor fabrication. Proven track record of leading complex research projects from concept to peer-reviewed publication, patent, and securing competitive international funding (JSPS Fellowship). An adaptable and creative problem-solver who effectively leverages emerging technologies, including directing generative AI to architect and deploy complex applications, such as a multi-agent system for automated scientific peer-review. Seeking to apply a deep scientific background and technical project management skills to solve complex challenges in a research or technology-driven environment.

Core Competencies & Technical Skills

- **Scientific Research & Nanotechnology:**
  - DNA Nanotechnology & Self-Assembly
  - Biosensors & Field-Effect Transistors (FETs)
  - Surface Chemistry & Functionalization
  - Drug Delivery & Molecular Encapsulation
  - Soft Materials & Polymer Science
  - Prebiotic Chemistry
- **Data Analysis & Characterization:**
  - **Microscopy:** Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM)
  - **Spectroscopy:** FTIR, UV-Vis, XPS, NMR, GC-MS
  - **Diffraction:** X-ray Diffraction (XRD)
  - **Electrical Analysis:** FET Electrical Measurements, Capacitance Testing
- **Technical Project Management & Innovation:**
  - **Funding Acquisition:** Grant Writing (EIC, ERC, MSCA), Proposal Development, Securing Fellowships
  - **Technology Transfer:** Intellectual Property (IP) Strategy, Market Research
  - **AI Project Management:** Prompt Engineering, Directing Generative AI (Gemini) for Code Generation
  - **Software Development Lifecycle:** Full-Stack & DevOps Principles, Git Version Control, Cloud Deployment

Projects & Research Highlights

Open AI Science - AI-Powered Scientific Peer Review Platform | *Project Lead & Designer*

- Conceived, designed, and directed the creation of "Open AI Science,"(https://www.openaiscience.com) a full-stack web application that uses a multi-agent AI system to automate and enhance the scientific peer-review process.
- **AI System Design:** Architected a multi-agent AI pipeline where distinct "specialist" agents (e.g., Librarian, Analyst, Scorer) collaborate to deconstruct, analyze, and score manuscripts, providing objective and comprehensive feedback.
- **Full-Stack Architecture:** Specified the complete technical architecture, including a Python/Flask backend, a PostgreSQL database (managed via SQLAlchemy), and a dynamic React.js frontend.

- **Advanced Feature Implementation:** Oversaw the integration of key functionalities, including a secure user authentication system (with ORCID), real-time AI-to-user questioning via WebSockets (Socket.IO), and a comprehensive admin dashboard with role-based access control and system monitoring tools.

DNA-FET for High-Speed Data Retrieval | *Lead Researcher & Inventor*

- Developed and fabricated a proof-of-concept DNA Field-Effect Transistor (FET), demonstrating a novel, non-destructive electronic method for data location in DNA data storage.
- Engineered an ultra-selective nanoporous DNA sensing layer, achieving near-perfect specificity in identifying a target ssDNA tag among a pool of confounding sequences.
- Validated the sensor's high performance, leading to a first-author publication in *Advanced Sensor Research* and a Japanese patent application on the core technology.
- This foundational work established the basis for the proposed **AXON-DNA** system, a next-generation platform envisioned to integrate multi-sensor arrays with an AI-powered indexing engine for large-scale, random-access data retrieval.

DNA-pods: Biomimetic Nanocarriers for Drug Delivery | *Lead Researcher & Inventor*

- Designed and synthesized "DNA-pods," a novel class of self-assembled DNA condensates, as a cost-effective platform for therapeutic delivery.
- Developed a scalable, one-pot synthesis protocol for the hierarchical assembly of the DNA-pods, bypassing the complexity of traditional DNA origami.
- Engineered a unique, thermally-triggered exfoliation mechanism inspired by viral uncoating to enable stimulus-responsive payload release.
- Validated the platform by demonstrating efficient encapsulation of doxorubicin and its preferential localization within the nucleus of fixed cancer cells.

AI-Directed Software Engineering: Crypto Gaming App (RoadToMars) | *Project Lead & Designer*

- Directed a generative AI (Gemini) to architect and build a full-stack, real-time Web3 application on the Solana blockchain (https://www.roadtomars.app/).
- Managed the complete DevOps lifecycle, overseeing the AI-assisted coding and independently deploying the application to cloud services (Render, Netlify).

Professional Experience

AI Development Consultant • Independent • Paris, France • Jun 2025 – Present

- Developing deep expertise in AI-driven software development by architecting and deploying diverse full-stack applications—from a scientific analysis platform ("Open AI Science") to a Web3 gaming application on the Solana blockchain ("RoadToMars") using generative AI tools.
- Formulating consulting offerings to help researchers and tech startups leverage AI for rapid prototyping, workflow automation, and innovative product development.

Postdoctoral Fellow (JSPS) • National Institute for Materials Science (NIMS) • Tsukuba, Japan • Apr 2022 – Apr 2025

- Secured a highly competitive ¥3M JSPS Postdoctoral Fellowship to pioneer the use of DNA Field-Effect Transistors (DNA-FETs) for data storage applications.
- Engineered and fabricated novel FET sensors from scratch, developing an innovative DNA probe functionalization method that achieved near-perfect selectivity and a sub-femtomolar detection limit.
- Managed the full research lifecycle, resulting in a corresponding-author publication in *Advanced Sensor Research* and a patent filing for a new DNA retrieval method.

- Invited Researcher from January to April 2025 to work on research initiatives in prebiotic chemistry, DNA-based 2D materials, and novel drug delivery systems.

CTO & Co-founder • Gensor • Paris, France • Jun 2021 – Jun 2023

- Co-founded a deep-tech startup to commercialize a proprietary virus testing platform based on gene field-effect transistor technology.
- Secured non-equity funding and mentorship by gaining acceptance into the competitive MassChallenge global accelerator program.

Project Manager, Technology Transfer • CNRS Innovation • Paris, France • Jan 2021 – Jan 2022

- Performed due diligence on early-stage (TRL 1-2) research projects to assess commercial viability and guide funding strategy.
- Developed technology valorization roadmaps by conducting market analysis, end-user needs assessment, and intellectual property (IP) analysis.

Education

Ph.D., Nanoscience & Condensed Materials • Aix-Marseille Université • Marseille, France
M.Sc., Polymer Science (Magna Cum Laude) • Université Paris-Est Créteil • Créteil, France
B.Sc., Biology & Chemistry (Magna Cum Laude) • Université Paris-Est Créteil • Créteil, France

Highlighted Publications & Patents

- **Kilinc,V.***, et al. *DNA-pods Mimicking Viral Uncoating with Functional Molecule Encapsulation Capabilities, under review at* **Communications Materials***, 2025*
- **Kilinc, V.***, et al. *DNA Chromopods: Engineering Chromosome-Inspired Nanoarchitectures as Protocell Blueprints.* **ChemRxiv**, 2025.
- **Kilinc, V.***, et al. *Nanoporous Dna Field Effect Transistor with Potential for Random-Access Memory Applications.* **Advanced Sensor Research**, 2024.
- **Nguy, T.P.; Kilinc, V. (co-first author)**, et al. *Affinity driven ion exchange EG-OFET sensor for high selectivity and low limit of detection of cesium in seawater.* **Sensors and Actuators B: Chemical**, 2022.
- **Kilinc, V.**, et al. *Novel and Innovative Interface as Potential Active Layer in Chem-FET Sensor Devices for the Specific Sensing of Cs+.* **ACS Applied Materials & Interfaces**, 2019.
- **Kilinc, V.***, et al. "Method of DNA retrieving by using field-effect transistor", JP Patent Application, 2023.
- Wakayama, Y; **Kilinc, V.**, et al. "Alkali metal ion detection sensor and radioactive cesium ion detection sensor", JP Patent Issued, 2020.

Conferences & Scientific Dissemination

- Presented research at over 10 international conferences and workshops, including 5 oral presentations (one as an invited speaker) and a poster presentation to Nobel Laureates at the 15th HOPE Meeting in Kyoto (Japan).

Certifications & Awards

- Invited Researcher Grant, NIMS, Japan, 2025
- 15th HOPE Meeting with Nobel Laureates – Participation Award, 2024
- JSPS Postdoctoral Fellowship (¥3M), Japan Society for the Promotion of Science, 2022
- Webimarathon: Blockchain & Crypto Certificate of Completion, Binance, 2021
- Poster Award, Giornate Italo-Francesi di Chimica (GIFC), 2018