

# Enes Senel

Senior Scientist · Computational Biology

Berlin, Germany · [enes.senel@proton.me](mailto:enes.senel@proton.me) · [github.com/enessenel](https://github.com/enessenel) · [enesenel.lovable.app](https://enesenel.lovable.app)

## SUMMARY

Senior Scientist with a decade of experience leading computational biology, single-cell multi-omics, and machine-learning programs across pharma, academia, and medical robotics. Currently leading multi-omics strategy in oncology and immunology at Johnson & Johnson Innovative Medicine. Co-author of widely used open-source tools (novoSpaRc, Optocoder), co-inventor on a US patent, and published in Nature Protocols and NAR Genomics & Bioinformatics. Strengths: technical leadership, reproducible production pipelines, cross-functional translation from data to therapeutic decisions, and mentoring scientists.

## CORE SKILLS

**Leadership:** Technical leadership, scientific strategy, mentorship, stakeholder management, cross-functional collaboration

**Computational Biology:** Single-cell RNA-seq, CITE-seq, spatial transcriptomics, multi-omics integration, cell-cell interactions, biomarker discovery

**Machine Learning:** Deep learning, optimal transport, protein language models (ProtBERT), domain adaptation, computer vision

**Engineering:** Python, R, C++, CUDA, PyTorch, TensorFlow, Nextflow, scanpy, SQL, Docker, reproducible pipelines

**Domain:** Oncology, immunology, cell therapy, CMC analytics, pharma QC, medical robotics, neuroscience

## PROFESSIONAL EXPERIENCE

### Senior Scientist, Computational Biology

Johnson & Johnson Innovative Medicine · Berlin, Germany · Aug 2025 — Present

Technical lead for single-cell multi-omics in oncology and immunology — shaping computational strategy from discovery through product development.

- Lead end-to-end single-cell multi-omics programs (transcriptomics, proteomics, spatial) that directly inform target selection, mechanism-of-action narratives, and translational strategy for oncology and immunology assets.
- Set analytical direction across parallel projects — defining standards, reviewing methodology, and aligning computational deliverables with clinical and discovery stakeholders.
- Mentor junior scientists and manage external consultants; grow team capability through code review, design discussions, and structured onboarding.
- Partner with wet-lab, clinical, and CMC teams to translate computational insights into experimental designs and go/no-go decisions on assets in development.

**Skills:** Team leadership, Scientific strategy, Single-cell multi-omics, Oncology & immunology, Stakeholder management, Mentorship

## **Data Scientist, Computational Biology**

*Johnson & Johnson Innovative Medicine · Berlin, Germany · Oct 2023 — Jul 2025*

Built the team's production analysis infrastructure and led single-cell projects across clinical and manufacturing programs.

- Architected and shipped automated high-throughput Nextflow/Python pipelines for scRNA-seq, CITE-seq, and multi-modal analyses — turning week-long manual workflows into reproducible runs.
- Led single-cell analyses underpinning biomarker discovery for a clinical-stage cell therapy and process characterization for CMC, contributing directly to regulatory-grade documentation.
- Established team conventions for reproducibility (containerization, version-controlled pipelines, QC standards) adopted as the default for new projects.
- Acted as go-to technical reviewer, raising the bar on rigor and reproducibility across the group.

**Skills:** Pipeline architecture, Nextflow, Python, scRNA-seq / CITE-seq, Reproducibility, Cell therapy biomarkers, CMC analytics

## **Doctoral Researcher — Computational Biology**

*Max Delbrück Center for Molecular Medicine · Berlin, Germany · Oct 2019 — Sep 2023*

PhD developing and scaling open-source methods for spatial transcriptomics, adopted by labs and industry worldwide.

- Designed and led Optocoder, an ML pipeline for decoding barcoded transcripts from imaging-based spatial transcriptomics — published in NAR Genomics & Bioinformatics and adopted by external labs.
- Re-architected novoSpaRc (optimal-transport reconstruction of tissue architecture from scRNA-seq) for scalability, unlocking application to whole-tissue datasets; co-authored Nature Protocols paper.
- Co-inventor on a US patent for 3D spatial gene-expression reconstruction.
- Owned the full research lifecycle: problem framing, method development, benchmarking, open-source release, documentation, and supporting external users.

**Skills:** Method development, Spatial transcriptomics, Optimal transport, Open-source ownership, Scientific writing, Patents

## **Visiting Scientist**

*The Hebrew University of Jerusalem · Rehovot, Israel · Feb 2023 — Apr 2023*

Independent collaboration applying protein LLMs to agricultural biotech discovery.

- Led an independent short-term project applying protein language models (ProtBERT) to discover novel anti-insecticidal proteins from raw sequence data — combining transfer learning with biological priors to guide downstream experimental validation.

**Skills:** Protein language models, Transfer learning, Cross-disciplinary collaboration

## **Machine Learning Research Engineer**

*Coriolis Pharma GmbH · Munich, Germany · Apr 2019 — Sep 2019*

Delivered a production-ready deep-learning system for pharmaceutical QC.

- Developed and shipped deep-learning models for automated particle detection and classification from flow-microscopy images used in biopharmaceutical QC.
- Built an end-to-end Python/PyTorch/TensorFlow package — handed off to internal scientists as a self-serve tool.

**Skills:** Deep learning, Computer vision, PyTorch / TensorFlow, Pharma QC, Productization

## Research Assistant — Computational Neuroscience

Max Planck Institute for Brain Research · Frankfurt am Main, Germany · May 2018 — Sep 2019

Multi-omics integration for activity-dependent neuroscience.

- Applied supervised ML to investigate activity-dependent changes in the neuronal proteome.
- Designed a multimodal integration and domain-adaptation pipeline bridging proteomic and transcriptomic datasets — foundational experience in cross-modality reasoning later applied to industry.

**Skills:** Multi-omics integration, Domain adaptation, Supervised ML

## Undergraduate Research Assistant — Medical Robotics

Ozyegin University Robotics Lab · Istanbul, Turkey · 2014 — 2016

Real-time perception for an image-guided biopsy robot.

- Developed real-time needle-tip localization and tracking from ultrasound imaging, enabling autonomous robotic control for image-guided biopsy.
- Built a C++/CUDA software interface coupling real-time image analysis with robot control — first exposure to shipping latency-critical scientific software.

**Skills:** Real-time computer vision, C++ / CUDA, Medical robotics

## EDUCATION

---

### Ph.D. in Computational Biology

Humboldt University of Berlin · Max Delbrück Center · 2019 — 2026 (expected)

Thesis: Computational modelling and machine learning for spatial transcriptomics and cell–cell interactions.

### M.Sc. in Computer Science

Technical University of Munich · 2016 — 2019

Thesis: Analysis of activity-dependent proteomic changes associated with homeostatic scaling. DAAD MSc Scholarship.

### B.Sc. in Computer Science

Ozyegin University, Istanbul · 2012 — 2016

Thesis: A standalone application for a 2D ultrasound-guided medical robotic system.

## SELECTED PUBLICATIONS

---

### Ciltacabtagene autoleucel biomarkers of response in relapsed/refractory multiple myeloma patients from CARTITUDE-1: a phase 1b/2 study

R.M. de Oca, F. Wang, M. Hao, D. Smirnov, ... E. Senel, ... V. Plaks

*Blood Cancer Discovery* — Under revision · 2025

### Optocoder: computational decoding of spatially indexed bead arrays

E. Senel, N. Rajewsky, N. Karaiskos

*NAR Genomics & Bioinformatics* · 2022

### novoSpaRc: flexible spatial reconstruction of single-cell gene expression with optimal transport

N. Moriel\*, E. Senel\*, N. Friedman, N. Rajewsky, N. Karaiskos, M. Nitzan

*Nature Protocols* · 2021

### Particulate impurities in cell-based medicinal products traced by flow imaging microscopy combined with deep learning for image analysis

A.D. Grabarek, E. Senel, T. Menzen, K.H. Hoogendoorn, K. Pike-Overet, A. Hawe, W. Jiskoot

*Cytotherapy* · 2021

## **Gabor filter-based localization of straight and curved needles in 2D ultrasound images**

M. Kaya, E. Senel, O. Bebek

*Turkish Journal of Electrical Engineering & Computer Sciences* · 2020

## **Visual needle tip tracking in 2D US guided robotic interventions**

M. Kaya, E. Senel, A. Ahmad, O. Bebek

*Mechatronics* · 2019

## **Visual tracking of multiple moving targets in 2D ultrasound guided robotic percutaneous interventions**

M. Kaya, E. Senel, A. Ahmad, O. Bebek

*ICRA, Singapore* · 2017

## **Visual tracking of biopsy needles in 2D ultrasound images**

M. Kaya, E. Senel, A. Ahmad, O. Bebek

*ICRA, Stockholm* · 2016

## **Real-time needle tip localization in 2D ultrasound images for robotic biopsies**

A. Ahmad, O. Orhan, E. Senel, O. Bebek

*ICAR, Istanbul* · 2015

## **PATENTS**

---

### **Method and system for 3D reconstruction of tissue gene expression data**

S. Abbiati, J. Alles, S. Ayoub, S. Ehrig, N. Karaikos, G. Macino, S. Preibisch, N. Rajewsky, E. Senel, A. Woehler  
*US20240257914A1* · 2022

## **SELECTED OPEN-SOURCE PROJECTS**

---

**Optocoder** — ML pipeline for decoding barcoded transcripts from imaging-based spatial transcriptomics.

[github.com/rajewsky-lab/optocoder](https://github.com/rajewsky-lab/optocoder)

**novoSpaRc** — Optimal-transport-based reconstruction of spatial gene expression from scRNA-seq.

[github.com/rajewsky-lab/novosparc](https://github.com/rajewsky-lab/novosparc)

## **SERVICE & COMMUNITY**

---

**Helmholtz Juniors — Elected Member (2022 — 2023):** Represented ~8,000 PhD students across the Helmholtz Association; contributed to the 2021 PhD survey analysis and per-center reports.

**MDC PhD Representatives — Awareness Team (2020 — 2023):** Worked on contracts, salaries, and working conditions for doctoral students at the Max Delbrück Center.

## **LANGUAGES**

---

English (Fluent) · German (Advanced) · Turkish (Native)