

KEMAL INECIK

Munich, Germany
kemal.inecik@helmholtz-munich.de
kemalinecik.com

Scientist at the interface of computer science and complex systems, though curiosity, more than any title, is what explains me. The problems that hold me share a structure: data large enough, and intricate enough, that the order inside stays invisible until it is deliberately sought. My work lives in the two acts that follow: drawing that order into view, and then making it sturdy enough to trust. What sustains me through it is the pursuit itself, more than any single answer it produces. The harder a question resists, the more it holds me.

EDUCATION

- **Doctor of Philosophy in Machine Learning and Computational Biology.**
  Technical University of Munich (TUM) & Helmholtz Center Munich. Germany. 2022 Feb - Present.
  Area: Specializing in developing machine learning solutions for complex biomedical challenges in **Fabian Theis** lab.
- **Master of Science in Systems Biology.**
  Heidelberg University. Germany. 2018 Oct - 2021 Sep.
  Thesis Title: "Development of a statistical model predicting ribosome collision dynamics and discovery of the role of ribosome collision in co-translational protein folding and assembly" in Bukau lab.
- **Bachelor of Science in Molecular Biology and Genetics.** (with Bioinformatics major)
  Bilkent University. Turkey. 2013 Sep - 2018 Jun.
  Thesis Title: "Computational automatization of the pipeline for identification of disease-causing variants" in Ozcelik lab.

PUBLICATIONS

- **K. Inecik***, A. Rose*, C. Xu*, S. Webb*, L. Steele*, MA. Kuri*, E. Stephenson*, D. Jafree* [and 40 others], SA. Teichmann, FJ. Theis, F. Progatzky, OA. Bayraktar, M. Haniffa (2026), "*An integrated single cell and spatial omics atlas of human prenatal development*", In review at **Nature**
- **K. Inecik,** C. Srinivasan, AO. Can, FJ. Theis (2026), *"Buy Different, Buy More, or Buy Nothing? Valuing Paired Data for Model Reuse"*, In review at **AISTATS**.
- **K. Inecik,** E. Sevinc, E. Erken, FJ. Theis (2026), *"Chimera: Cross-Species Single-Cell Generative Modeling of Expression-Deployment Evolution Beneath Protein Conservation"*, In review at **Cell Systems**.
- **K. Inecik***, Y. Karisman*, JP. Schnitzler, FJ. Theis (2026), *"The price of any molecule: decomposed estimation of biosynthetic cost reveals the metabolome's cost landscape"*, Manuscript in preparation.
- **K. Inecik***, AA. Ceylan*, FJ. Theis (2026), *"Annotated cell states miss clonal memory, so lineage tracing cannot yet separate instruction from selection"*, Manuscript in preparation.
- **K. Inecik**, M. Luecken, FJ. Theis (2026), *"Cellucid: Unlocking multi-million-cell single-cell datasets for interactive exploration, analysis, and collaborative annotation"*, Manuscript in preparation.
- **K. Inecik**, E. Erken, FJ. Theis (2026), *"IDTrack: Time- and Namespace-Aware Identifier Harmonization for Reproducible Workflows"*, bioRxiv. [Also accepted for **spotlight** talk in **ICSB** Conference 2023, Hartford]
- **K. Inecik**, A. Rose, M. Haniffa, M. Luecken, FJ. Theis (2024), *"Beyond Visual Inspection: Principled Benchmarking of Single-Cell Trajectory Representations with scTRAM"*, bioRxiv. [Accepted for **ICML** Conference GenBio Workshop 2025, Vancouver]
- **K. Inecik**, A. Kara, A. Rose, M. Haniffa, FJ. Theis (2026), *"TarDis: Achieving Robust and Structured Disentanglement of Multiple Covariates"*, **Cell Systems**. [Accepted for **ICML** Conference AI4Science Workshop 2024, Vienna; Accepted for **RECOMB** Conference 2025, Seoul]
- **K. Inecik**, A. Meric, L. Koenig, FJ. Theis (2023), *"flowVI: Flow Cytometry Variational Inference"*, bioRxiv. [Accepted for **NeurIPS** Conference GenBio Workshop 2023, New Orleans]
- **K. Inecik**, FJ. Theis (2023), *"scARE: Attribution Regularization for Single Cell Representation Learning"*, bioRxiv. [Accepted for **spotlight** talk in **ICML** Conference CompBio Workshop 2023, Hawaii]
- E. Cacace, V. Kim, V. Varik, M. Knopp, M. Tietgen, A. Brauer-Nikonow, **K. Inecik**, A. Mateus, A. Milanese, M. Torrissen Mårli, K. Mitosch, J. Selkrig, AR. Brochado, O. Kuipers, M. Kjos, G. Zeller, M. Savitski, S. Göttig, W. Huber, A. Typas (2023), *"Systematic analysis of drug combinations against Gram-positive bacteria"*, **Nature Microbiology**.
- **K. Inecik**, A. Uhlmann, M. Lotfollahi, FJ. Theis (2022), *"MultiCPA: Multimodal Compositional Perturbation Autoencoder"*, bioRxiv. [Accepted for **ICML** Conference CompBio Workshop 2022, Baltimore]
- L. Sikkema, C. Ramírez-Suástegui, D. Strobl, T. Gillett, L. Zappia, E. Madissoon, NS. Markov, LE. Zaragosi, **K. Inecik** [and 90 others], AV. Misharin, MC. Nawijn, MD. Luecken, FJ. Theis (2023), *"An integrated cell atlas of the human lung in health and disease"*, **Nature Medicine**.
- J. Muscato, H. Morris, A. Mychack, M. Rajagopal, V. Baidin, A. Hesser, W. Lee, **K. Inecik**, L. Wilson, C. Kraml, T. Meredith, S. Walker (2022), *"Rapid inhibitor discovery by exploiting synthetic lethality"*, **Journal of the American Chemical Society**.

EXPERIENCE

- **Harvard University** - Research Internship. 2019 Sep - 2020 Feb
  › Developed a computational graph model to analyze S. aureus membrane biology, enhancing predictive accuracy with TnSeq data.
  › Investigated MprF protein, defining its role in the d-alanylation pathway to identify therapeutic targets.
  › Analyzed extensive drug screening data using cheminformatic tools, identifying the target of a novel inhibitor on LTA pathway.
- **Heidelberg Institute for Theoretical Studies (HITS)** - Student Employment. 2018 Dec - 2019 Oct
  › Extracted biochemical reactions and kinetics from literature to prepare a predictive platform for biochemical reaction dynamics
- **Heidelberg University, BioQuant** - Research Internship. 2019 May - 2019 Sep
  › Classified telomere images into distinct classes using conventional machine learning and advanced feature extraction methods.
  › Developed and deployed a convolutional neural network (CNN) that leverages transfer learning from pretrained models such as ResNet and DenseNet, significantly enhancing classification accuracy and model adaptability.
- **The European Molecular Biology Laboratory (EMBL)** - Research Internship. 2019 Feb - 2019 May
  › Investigated the species-specific activity of antibacterial drug combinations, enhancing targeted therapeutic strategies.
  › Conducted computational analysis to elucidate the relationship between the chemical structures of antibiotics and their biological interaction partners, aiming to inform drug design and mechanism of action.
- **Bilkent University** - Undergraduate Researcher. 2014 Dec - 2018 Mar
  › Investigated genetic factors of complex diseases in consanguineous families, contributing to understanding complex disease mechanisms.
  › Engineered computational pipelines and algorithms for WES data, enhancing variant prioritization and accelerating genetic research.
- **The Rockefeller University** - Research Internship. 2017 Jun - 2017 Aug
  › Contributed to the identification of the CHP1-GPAT4 protein complex as a key regulator of compartmentalized glycerolipid synthesis.
  › Analyzed CRISPR-based genetic screens and unbiased lipidomics to reveal pivotal role of the complex in cellular fatty acid metabolism.
  › Mapped the evolutionary trajectories of the protein complex through sequence homology across species.
- **Broad Institute** - Research Internship. 2016 Aug - 2016 Sep
  › Studied how therapy-resistant cancer cells rely on lipid peroxidase pathways, aiding in the development of potential new treatments.
- **Massachusetts Institute of Technology (MIT)** - Research Internship. 2016 Jun - 2016 Aug
  › Studied dietary regulation of intestinal stem cell tumorigenesis. Investigated histone demethylases' effects on cancerous organoids.
  › Processed and analyzed RNA-seq data to uncover differentially expressed genes and pathways involved in tumorigenesis.

HONORS & AWARDS

- "Best Student Paper – Best Young Scientist" **Award**. *RECOMB Conference, April 2025*
- Best Poster **Award**. *ICML Conference AI4Science Workshop, Jul 2024*
- **Scholarship** for a research internship at Harvard University. *Eriktronik, May 2019*
- Awarded a **grant**. *"An algorithm to identify novel anti-carcinogen natural compounds by investigating molecular fragments of known drugs via cheminformatic tools and machine learning" TÜBİTAK, 2019*
- Full tuition **scholarship** during graduate education. *Heidelberg University, Oct 2018*
- **Scholarship** for graduate education. *German Academic Exchange Service (DAAD) and TEV, May 2018*
- **Scholarship** for summer undergraduate research (SURF) program. *The Rockefeller University, Apr 2017*
- Awarded a **grant**. *"Domain-domain interaction prediction algorithm via a novel approach to structural domain conservation" TÜBİTAK, 2017*
- **Scholarship** for a research internship at MIT. *North East Turkish-American (NETA) Scholars, Jun 2016*
- Dean's High Honor List for all semesters. *Bilkent University, 2013 - 2018*
- Awarded a **grant**. *"Individual and cumulative assessment of structural protein motifs based on their susceptibility to mutations by computational analysis" TÜBİTAK, 2016*
- Honored for my initiatives to popularize science education and olympiads in Turkey. *Metropolitan Municipality of Ankara as well as TBMM (Turkish Grand National Council), 2013*
- **Scholarship** for undergraduate education. *TÜBİTAK, 2013*
- Comprehensive **scholarship** for undergraduate education. *Bilkent University, Sep 2013*
- **0.01% percentile** in YGS-LYS (National University Student Selection and Placement Exam) among 1,850,000 students. *The Measuring, Selection and Placement Center (ÖSYM), Jul 2013*
- Honored for my successes in biology olympiads and project contests. *Ministry of Education of Turkey, as well as Ministry of Science, Industry and Technology of Turkey, 2012*
- Selected to be one of twenty students for biology olympiads preparatory courses for two years. *TÜBİTAK, 2012*
- 'Award of Excellence' owing to my achievements in project contests. *Rotary Club, May 2012*
- **Ranked 2nd** in regional biology olympiads. *TÜBİTAK, May 2012*
- **Bronze medal** in national biology olympiads. *TÜBİTAK, Dec 2011*
- **Gold medal** in international research project contest. *MEF-EBAV, May 2011*
- **Bronze medal** in regional project contest. *TÜBİTAK, Mar 2011*
- Awarded a **grant**. *"An economic model for antibody purification: molecularly imprinted heat sensitive smart polymers" Hacettepe University,2010*
- **0.1% percentile** in SBS (High School Entrance Exam) among about 1,250,000 students. *Ministry of Education, Turkey, Jun 2009*