Curriculum Vitae: Christoph Bock (1 January 2025)

Research Statement

Goal: To advance biomedicine with technology-driven research, combining experimental and computational approaches to understand and program epigenetic cell states and to develop cell-based therapies for cancer and immune diseases.

Areas of research:

- *Single-cell biology*. Epigenetic cell states contribute broadly to the regulation of human organs. As part of the Human Cell Atlas, we use single-cell and spatial sequencing to dissect their role in tissue homeostasis and pathogenesis.
- *Biotechnology*. Groundbreaking discoveries are often enabled by new technology. We develop and apply innovative methods in the areas of single-cell sequencing, CRISPR screening, epigenome editing, and synthetic biology.
- *Bioinformatics*. Computational methods are essential for data-driven biomedical research. We develop algorithms and software for large-scale data analysis, and we pursue clinical collaborations to establish medical impact.
- *Machine learning*. Huge datasets pose new analytical challenges. As part of the European Laboratory for Learning and Intelligent Systems, we develop methods for interpretable deep learning and artificial intelligence in biomedicine.
- *Cell therapy*. CAR T cells have shown dramatic efficacy for blood cancers and spearhead a broader shift toward personalized cell-based therapies. We use high-throughput technology to design synthetic immune cells as therapeutics.

Mentoring & scientific citizenship: I am strongly committed to training junior scientists for successful careers in biomedical research. PhD students and postdocs in our research group have won prestigious fellowships and prizes, and proceeded to independent careers at universities and research institutes in Europe and in the USA (https://tinyurl.com/bocklab-alumni).

Lab & institute website: https://bocklab.org | http://cemm.at/research/groups/christoph-bock-group | http://med-ai.org

Social media: https://linkedin.com/in/christoph-bock | bsky.app/profile/bocklab.bsky.social | twitter.com/BockLab

Academic Positions

Since Jan. 2012	Principal investigator at the CeMM Research Center for Molecular Medicine (Vienna, Austria); scientific coordinator of the Biomedical Sequencing Facility serving Vienna's medical campus
Since Jan. 2021	Professor of Medical Informatics at the Medical University of Vienna; Head of the Institute of Artificial Intelligence at the Center for Medical Data Science, Medical University of Vienna
Apr. 2016 - Mar. 2023	Informatics group leader at the Ludwig Boltzmann Institute for Rare und Undiagnosed Diseases
Feb. 2009 - Dec. 2011	Postdoctoral fellow (Humboldt Foundation & King Trust) at the Broad Institute and the Harvard Department of Stem Cell and Regenerative Biology (USA). Supervisor: Alexander Meissner
Jun. 2008 - May 2019	Adjunct group leader for computational epigenetics in the Department of Computational Biology (headed by Thomas Lengauer) at the Max Planck Institute for Informatics (Germany)
Oct. 2004 - May 2008	PhD student in the Department of Computational Biology at the Max Planck Institute for Informatics (Germany). Supervisors: Thomas Lengauer and Jörn Walter. Grade: *summa cum laude*
Aug. 2003 - Sep. 2004	Undergraduate research and Master thesis in bioinformatics at the University of Heidelberg (Germany), RIKEN Genomic Science Center (Japan), National Chiao Tung University (Taiwan)
1999 - 2004	Undergraduate studies in computer science, business information systems, and international management at the University of Mannheim (Germany) and University of Wales, Swansea (UK)
1986 - 1999	School attendance in Osnabrück (Germany) and graduation at Ratsgymnasium Osnabrück, followed by one year of community service at the state psychiatric hospital

Prizes & Recognitions (selection)

2022	Erwin Schrödinger Prize (main research prize of the Austrian Academy of Sciences in the natural sciences)
Since 2019	Annual "Highly Cited Researcher" designation by ISI Web of Science (Clarivate Analytics)
2017	International Society for Computational Biology (ISCB) Overton Prize (main research prize for early-to-mid career scientists in bioinformatics, awarded annually since 2001)
2017 - 2025	Elected member of the Young Academy, Austrian Academy of Sciences (in the Directorate: 2021 - 2025)
2009	Otto Hahn Medal (the Max Planck Society's award for outstanding PhD theses)
2000 - 2008	Undergraduate & postgraduate scholarships by the German National Academic Foundation

Research Grants (selection)

2024 - 2029	Austrian Excellence Initiative "Emerging Fields". Consortium led by Igor Adameyko. Topic: Developmental resilience of the brain. Own role: Co-PI.
2024 - 2029	Austrian Excellence Initiative "Clusters of Excellence". Consortium led by Tibor Harkany. Topic: Biology of GABAergic neurons. Own role: Key researcher.
2021 - 2026	European Research Council (ERC) Consolidator Grant. Research grant led by Christoph Bock. Topic: Genetic and epigenetic programming of CAR T cells for cancer immunotherapy.
2020 - 2022	EU Horizon 2020 / Human Cell Atlas project: HCA|Organoid. Consortium led by Christoph Bock Topic: Single-cell characterization of human organoids. Own role: Coordinator.
2019 - 2027	Austrian Science Fund (FWF) Special Research Program (SFB). Consortium led by Wilfried Ellmeier Topic: Epigenetics in immunology. Own role: PI.
2017 - 2025	Austrian Science Fund (FWF) Special Research Program (SFB). Consortium led by Mathias Müller Topic: Cell signaling and chromatin. Own role: PI.
2016 - 2021	European Research Council (ERC) Starting Grant. Research grant led by Christoph Bock. Topic: Methods development for dissecting cancer epigenomes. Own role: Lead PI.
Fellowships & prizes won by lab members	European Molecular Biology Organization (5x), Human Frontier Science Program, Humboldt Foundation, German Research Foundation, Peter & Traudl Engelhorn Foundation, EU Marie Skłodowska-Curie Program (2x), Austrian Science Fund, Austrian Academy of Sciences (4x). German National Academic Foundation, ÖGMBT Award (2x); ÖGDV Science Award, ÖGAI Karl Landsteiner Award

Academic Activities (selection)

Paper reviewing	Nature, Science, Cell, Cancer Cell, Nature Biotechnology, Nature Medicine, Nature Immunology, Nature Reviews Genetics, Proceedings of the IEEE, Genome Biology (editorial board)
Grant reviewing	European Research Council (panel member: ERC Starting Grant LS2 2016, 2018, 2020, 2022; reviewer: ERC Consolidator, Advanced, Synergy), European Innovation Council (EU), National Science Foundation (US), MRC (UK), BBSRC (UK), Cancer Research UK, Wellcome Trust (UK), INSERM (F), AICR Foundation for Cancer Research (I), German Research Foundation (D)
Recruitment, tenure & prize reviewing	Johns Hopkins University (USA), Wellcome Sanger Institute (UK), Weizmann Institute (Israel), Max Planck Society (D), ISTA (Austria), Hamburger Wissenschaftspreis (D), Gottfried Wilhelm Leibniz Prize (D), Schmidt Futures Science Polymaths (USA), MacArthur Fellows Program (USA)
Scientific networks	Human Cell Atlas (Organizing Committee member), European Laboratory for Learning and Intelligent Systems (co-founder of the ELLIS Health Program), European Academies Science Advisory Council (EASAC) Biosciences & Public Health, International Human Epigenome Consortium
Conference organization	"Convergence? Interfaces of the Digital and the Living" 2023 (Austrian Academy of Sciences), Human Cell Atlas General Meeting 2022 (with A. Regev & S. Teichmann), Inaugural Symposium of the Austrian Platform for Personalized Medicine 2017 (with R. Kain), GET Global Conference / Personal Genome Project 2015 (with J. Bobe & G. Church), Vienna NGS Symposium 2018, 2016, 2014, 2013 (with A. Sommer), Machine Learning in Medicine Symposium 2019 (with G. Langs)
Citizen science	Co-lead of "Genom Austria" (2014-2017) with Giulio Superti-Furga, a pilot project on personal genomes together with the PersonalGenomes.org foundation and Harvard PGP (George Church)
Lectures & seminars	Teaching of bioinformatics and biomedicine at Medical University of Vienna (since 2012), University of Vienna (since 2013), Harvard University (2010-2011), and Saarland University (2005-2008)
Curriculum development	Responsible for the bioinformatics & genomics module of a flagship Master program in Molecular Precision Medicine, jointly run by Medical University Vienna & University of Vienna (since 2021)

Work Experience outside Academia

Spin-off companies	Co-founder of Myllia Biotechnology (2018), Vienna-based CRISPR screening company. Winner of the Austrian national start-up prize 2022 (https://www.gruendungspreis-phoenix.at/preistraegerinnen) Co-founder of Neurolentech (2020), Vienna & Cambridge (UK) based company developing patient-derived stem cell models for autism and epilepsy
Student internships	Allianz Group (2003): Corporate strategy; McKinsey (2002): IT roadmap for a healthcare provider

Conference Presentations (selection)

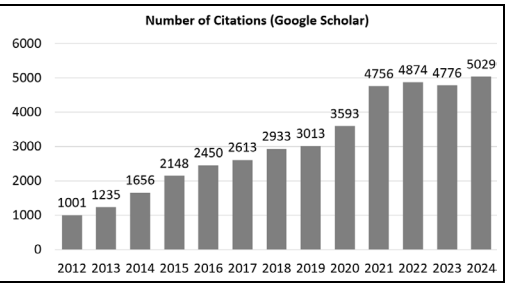
Apr. 2024	Epigenetic cell state engineering. *Keystone Symposium Systems and Engineering Immunology*, Banff
Mar. 2023	CRISPR single-cell sequencing. *Whitehead/MIT & Broad Institute "Cell Biology @ Scale" 2023*, Boston
Nov. 2022	Epigenetic programming of cells for therapy. *Harvard School of Public Health PQG Conference*, virtual
Dec. 2021	Looking into the epigenetic past and future of immune cells. *23rd EMBL PhD Symposium*, virtual
Sep. 2020	Single-cell sequencing of epigenetic disease landscapes. *WT / CSHL Genome Informatics Meeting*, virtual
Nov. 2019	Epigenetic disease landscapes and perturbations at scale. *EMBO Workshop Precision Health*, Heidelberg
May 2019	CROP-seq enables high-throughput functional biology. *CSHL Biology of Genomes Meeting*, New York
July 2017	Overton Prize Keynote Lecture. *Intelligent Systems for Molecular Biology (ISMB) Conference*, Prague

Publication Summary

Citation data from Google Scholar as of 1 January 2025:
Total citations: 41,764 (since 2020: 26,127); h-index: 103 (since 2019: 86)

Online publication list and citation data based on Google Scholar:
http://scholar.google.com/citations?user=9qSsTcIAAAAJ

Online publication list based on ORCID identifier:
https://orcid.org/0000-0001-6091-3088



Ten Most Relevant Publications (*corresponding author; #shared first / shared last author)

1. Schaefer M, Peneder P#, Malzl D, Peycheva M, Burton J, Hakobyan A, Sharma V, Krausgruber T, Menche J, Tomazou E, Bock C* (2024). *Multimodal learning of transcriptomes and text enables interactive single-cell RNA-seq data exploration with natural-language chats*. Manuscript submitted, preprint: https://doi.org/10.1101/2024.10.15.618501
2. Fortelny N, Farlik M#*, [33 middle authors], Decker T#, Müller M#, Bock C* (2024). *JAK-STAT signaling maintains homeostasis in T cells and macrophages*. **Nature Immunology** 5, 847-859. [highlighted by a Research Briefing article in Nature Immunology; Altmetric score of 132; 13 citations]
3. Moorlag S, Folkman L#, ter Horst R#, Krausgruber T#, [19 middle authors], Netea MG*, Bock C* (2024). *Multi-omics analysis of innate and adaptive responses to BCG vaccination reveals epigenetic cell states that predict trained immunity*. **Immunity** 57, 171-187 e114. [Research Highlight article in Nature; Altmetric score of 134; 26 citations]
4. Datlinger P, Rendeiro AF#, Boenke T, Senekowitsch M, Krausgruber T, Barreca D, Bock C* (2021). *Ultra-high-throughput single-cell RNA sequencing and perturbation screening with combinatorial fluidic indexing*. **Nature Methods** 18, 635-642. [Altmetric score of 232 for the paper and 241 for the bioRxiv preprint; 223 citations]
5. Krausgruber T, Fortelny N#, [8 middle authors], Bock C* (2020). *Structural cells are key regulators of organ-specific immune response*. **Nature** 583, 296-302. [highlighted by News & Views articles in Nature and in Nature Reviews Nephrology and by a Research Highlight article in Nature Reviews Immunology; Altmetric score 527, 381 citations]
6. Klughammer J, Kiesel B#, [50 middle authors], Woehrer A#, Bock C (2018). *The DNA methylation landscape of glioblastoma disease progression shows extensive heterogeneity in time and space*. **Nature Medicine** 24, 1611-1624. [Altmetric score of 178; 291 citations]
7. Datlinger P, Schmidl C, Rendeiro A, Krausgruber T, Traxler P, Klughammer J, Schuster L, Kuchler A, Alpar D, Bock C* (2017). *Pooled CRISPR screening with single-cell transcriptome readout*. **Nature Methods**, 14, 297-301. [journal cover image; News & Views articles in Nature Methods and Nature Biotechnology; highlighted in Biotechniques, in a Nature Methods Technology Feature, and on F1000Prime; Altmetric score of 148 for the paper and 49 for the bioRxiv preprint; 'Blue Flame Award' for highly popular plasmid at the AddGene repository; 1009 citations]
8. Farlik M, Halbritter F#, Müller F#, [12 middle authors], Frontini M*, Bock C* (2016). *DNA methylation dynamics of human hematopoietic stem cell differentiation*. **Cell Stem Cell** 19, 808-822. [part of the IHEC collection of epigenome studies, PaperClip in Cell; Altmetric score of 80; 282 citations]
9. Mass E, Ballesteros I#, Farlik M#, Halbritter F#, [8 middle authors], Beyer M#, Bock C#, Geissmann F* (2016). *Specification of tissue-resident macrophages during organogenesis*. **Science** 353, 6304. [highlighted by a Preview article published in the Immunity journal, highlighted in F1000Prime; Altmetric score of 76; 869 citations]
10. Bock C, Kiskinis E#, Verstappen G#, [8 middle authors], Eggan K*, Meissner A* (2011). *Reference Maps of human ES and iPS cell variation enable high-throughput characterization of pluripotent cell lines*. **Cell** 144, 439-452. [highlighted in Nature Reviews Genetics, Nature Biotechnology, Nature Methods, F1000Prime; Altmetric score 52; 1174 citations]