

# Ce-M-M-

Research Center for Molecular Medicine  
of the Austrian Academy of Sciences

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now!

Met -  
Val-His-Leu-Thr-  
Pro-Glu-Glu-Lys-Ser-Ala-  
Val-Thr-Ala-Leu-Tyr-Gly-Lys-  
Val-Asn-Val-Asp-Glu-Val-Gly-Gly-  
Glu-Ala-Leu-Gly-Arg-Leu-Leu-Val-Val-  
Tyr-Pro-Tyr-Thr-Gin-Arg-Phe-Phe-Glu-Ser-  
Phe-Gly-Asp-Leu-Ser-Thr-Pro-Asp-Ala-Val-  
Met-Gly-Asn-Pro-Lys-Val-Lys-Ala-His-Gly-  
Lys-Lys-Val-Leu-Gly-Ala-Phe-Ser-Asp-  
Gly-Leu-Ala-His-Leu-Asp-Asn-Leu-Lys-  
Gly-Thr-Phe-Ala-Thr-Leu-Ser-Glu-Leu-  
His-Cys-Asp-Lys-Lys-His-Val-Asp-Pro-  
Glu-Asn-Phe-Arg-Leu-Leu-Gly-Asn-Val-  
Leu-Val-Cys-Val-Leu-Ala-His-His-Phe-  
Gly-Lys-Glu-Phe-Thr-Pro-Pro-Val-  
Gin-Ala-Ala-Tyr-Gin-Lys-Val-Val-  
Ala-Gly-Val-Ala-Asn-Ala-Leu-Ala-  
His-Lys-Tyr-His-Met-Val-Leu-Ser-Pro-  
Ala-Asp-Lys-Thr-Asn-Val-Lys-Ala-  
Ala-Tyr-Gly-Lys-Val-Gly-Ala-His-Ala-  
Gly-Glu-Tyr-Gly-Ala-Glu-Ala-Leu-Arg-  
Met-Phe-Leu-Ser-Phe-Pro-Thr-Thr-Lys-Thr-Tyr-  
Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gin-  
Val-Lys-Gly-His-Gly-Lys-Val-Ala-Asp-Ala-Leu-Thr-  
Asn-Ala-Val-Ala-His-Val-Asp-Asp-Met-Pro-Asn-Ala-  
Leu-Ser-Ala-Leu-Ser-Asp-Leu-His-Ala-His-Lys-Leu-Arg-  
Val-Asp-Pro-Val-Asn-Phe-Lys-Leu-Leu-Ser-His-Cys-Leu-  
Val-Thr-Leu-Ala-Ala-His-Leu-Pro-Ala-Glu-Phe-Thr-Pro-  
Ala-Ser-Leu-Asp-Lys-Phe-Leu-Ala-Ser-Val-Ser-Thr-Val-  
Tyr-Arg-Met-Val-His-Leu-Thr-Pro-Glu-Glu-Lys-Ser-  
Gly-Lys-Val-Asn-Val-Asp-Glu-Val-Gly-Gly-Ala-Leu-Gly-Arg-Leu-Leu-Val-Val-Tyr-  
Pro-Tyr-Thr-Gin-Arg-Phe-Phe-Glu-Ser-Phe-Gly-Asp-Leu-Ser-Thr-Pro-Asp-Ala-Val-Met-  
Gly-Asn-Pro-Lys-Val-Lys-Ala-His-Gly-Lys-Lys-Val-Leu-Gly-Ala-Phe-Ser-Asp-Gly-Leu-Ala-His-  
Leu-Asp-Asn-Leu-Lys-Gly-Thr-Phe-Ala-Thr-Leu-Ser-Glu-Leu-His-Cys-Asp-Lys-Leu-His-Val-Asp-  
Pro-Glu-Asn-Phe-Arg-Leu-Leu-Glu-Asn-Val-Leu-Val-Gly-Val-Leu-Ala-His-His-Phe-Gly-Lys-Glu-  
Met-  
Val-His-Leu-Thr-  
Pro-Glu-Glu-Lys-Ser-Ala-Val-  
Thr-Ala-Leu-Tyr-Gly-Lys-Val-Asn-  
Val-Asp-Glu-Val-Gly-Gly-Glu-Ala-  
Leu-Gly-Arg-Leu-Leu-Val-Val-Tyr-  
Pro-Tyr-Thr-Gin-Arg-Phe-Phe-Glu-  
Ser-Phe-Gly-Asp-Leu-Ser-Thr-Pro-  
Asp-Ala-Val-Met-Gly-Asn-Pro-Lys-  
Val-Lys-Ala-His-Gly-Lys-Val-Leu-  
Gly-Ala-Phe-Ser-Asp-Gly-Leu-Ala-His-  
Leu-Asp-Asn-Leu-Lys-Gly-Thr-Phe-  
Ala-Thr-Leu-Ser-Glu-Leu-His-Cys-  
Asp-Lys-Leu-His-Val-Asp-Pro-Glu-  
Asn-Phe-Arg-Leu-Leu-Gly-  
Val-Leu-Val-Cys-Val-Leu-  
Ala-His-  
His-Phe-Gly-Lys-Glu-  
Phe-Thr-  
Pro-Pro-Val-Gin-Ala-Tyr-Gin-  
Lys-Val-Val-Ala-Gly-Val-Ala-Asn-  
Ala-Leu-Ala-His-Lys-Tyr-His-  
Met-Val-Leu-Ser-Pro-Ala-Asp-Lys-  
Thr-Asn-Val-Lys-Ala-Ala-Tyr-Gly-Lys-Val-  
Gly-Ala-His-Ala-Gly-Glu-Tyr-Gly-Ala-Glu-Ala-  
Leu-Glu-Arg-Met-Phe-Leu-Ser-Phe-Pro-Thr-Thr-  
Lys-Thr-Thr-Phe-Pro-His-Phe-Asp-Leu-Ser-His-  
Gly-Ser-Ala-Gin-Val-Lys-Gly-His-Gly-Lys-Lys-Val-  
Ala-Asp-Ala-Leu-Thr-Asn-Ala-Val-Ala-His-Val-Asp-  
Asp-Met-Pro-Asn-Ala-Leu-Ser-Ala-Leu-Ser-Asp-Leu-  
His-Ala-His-Lys-Leu-Arg-Val-Asp-Pro-Val-Asn-Phe-  
Lys-Leu-Leu-Ser-His-Cys-Leu-Leu-Val-Thr-Leu-Ala-  
Ala-His-Leu-Pro-Ala-Glu-Phe-Thr-Pro-His-Val-His-  
Ala-Ser-Leu-Asp-Lys-Phe-Leu-Ala-Ser-Val-Ser-Thr-  
Val-Leu-Thr-Ser-Lys-Tyr-Arg-Met-Val-His-Lys-

## Master Thesis: Biomedical Informatics and Precision Medicine

Apply now

We are recruiting an ambitious **master thesis student** who wants to pursue groundbreaking computational research including data analysis and software development in the areas of medical genomics, cancer, rare genetic diseases, and/or precision medicine. The position is paid according to FWF rates.

Our group at the **CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences** in Vienna combines biology/biomedicine including massive-scale data production (cancer genomes/epigenomes, single-cell sequencing, CRISPR screens) with advanced bioinformatics including data science algorithms, and deep learning. We work closely with physicians at the Medical University of Vienna, Vienna General Hospital, and St. Anna Children's Hospital, to advance precision medicine.

### The Project

Next generation sequencing is becoming widely used in the clinical diagnosis and personalized therapy of cancer and rare genetic diseases. The master thesis student will pursue an ambitious project that entails the development of new computational methods, the analysis of complex biomedical datasets, and/or the implementation of user-friendly software that will help advance precision medicine. Our lab has pioneered the combined use of high-throughput epigenomics and advanced computational methods for dissecting the epigenetic basis of cancer, toward the goal of enabling new approaches to precision medicine ([Nature Reviews Cancer 2012](#)). In recent projects, we have connected epigenome and clinical imaging data for brain tumor progression ([Nature Medicine 2018](#)), investigated epigenetic heterogeneity in a cancer of childhood ([Nature Medicine 2017](#)), identified clinically predictive chromatin signatures in leukemia ([Nature Communications 2016](#)), and modeled the time series dynamics in leukemia response to therapy ([preprint on bioRxiv](#)). All four papers were spearheaded and first-authored by bioinformaticians. Furthermore, we have

developed technology that enables large-scale functional dissection using CRISPR single-cell sequencing ([Nature Methods 2017](#)) and drug screening ([Nature Chemical Biology](#)). Potential projects for the successful master thesis student include: (i) development and validation of open-source software for rare disease diagnostics; (ii) single-cell data analysis of the cancer immune microenvironment in childhood cancer (with St. Anna Children's Cancer Research Institute); or (iii) development of deep learning algorithms for precision medicine.

## The Candidate

We are looking for ambitious candidates who want to build a scientific career in bioinformatics and/or data science research with applications in biology and medicine. Candidate should have a strong background in the quantitative sciences (computer science, bioinformatics, statistics, mathematics physics, engineering, etc.). We will also consider applicants with a background in biology or medicine who have strong quantitative skills (including programming) and a keen interest in pursuing computational projects (a combination with wet-lab research is possible).

## The Lab (<http://epigenomics.cemm.oeaw.ac.at/>)

The Medical Epigenomics Lab at CeMM pursues an interdisciplinary and highly collaborative research program aimed at understanding the cancer epigenome and establishing its utility for precision medicine. The lab is internationally well connected and active in several fields:

- *Bioinformatics*. New computational methods enable the high-throughput analysis of disease mechanism and therapy responses. We develop algorithms for single-cell sequencing, multi-omics data analysis, and clinical time series.
- *Epigenetics*. Complex diseases are characterized by widespread deregulation of epigenetic cell states. We use epigenome technology to dissect the epigenetic basis of cancer and immune diseases and to identify new drug targets.
- *Technology*. Groundbreaking biomedical research is often driven by new technologies. Our lab is therefore heavily invested into technology development, including single-cell sequencing, CRISPR screens, and deep neural networks.
- *Digital Medicine*. New technologies in the area of genomics, imaging, and wearable sensors transform medicine into a 'big data' science. We employ machine learning / artificial intelligence to leverage such data for better patient care.

## The Principal Investigator (<https://scholar.google.com/citations?user=9qSsTclAAAAJ>)

Christoph Bock is a principal investigator at CeMM. His research focuses on bioinformatics, epigenetics, cancer biology, and high-throughput technology development. He is also a guest professor at the Medical University of Vienna, scientific coordinator of the Biomedical Sequencing Facility at CeMM, and adjunct group leader for bioinformatics at the Max Planck Institute for Informatics. He is a member of the Young Academy of the Austrian Academy of Sciences (since 2017) and recipient of several major research awards, including the Max Planck Society's Otto Hahn Medal (2009), an ERC Starting Grant (2016-2021), and the Overton Prize of the International Society of Computational Biology (2017).

## The Institute (<http://www.cemm.at/>)

CeMM is one of Europe's leading biomedical research institutes. CeMM researchers routinely publish important discoveries in top journals. Over the last seven years, this included >10 papers in Nature/Cell/Science/NEJM and >30 papers in Nature/Cell sister journals – based on a team of 120-150 scientists. Research at CeMM is exceptionally collaborative and includes strong focus on medical impact, based on a profound molecular understanding of diseases such as cancer and immune disorders. CeMM is part of the Austrian Academy of Sciences and a founding member of EU-LIFE. It is located at the center of one of the largest medical campuses in Europe, within walking distance of Vienna's historical city center. A study by "The Scientist" put CeMM among the top-5 best places to work in academia worldwide (<http://the-scientist.com/2012/08/01/best-places-to-work-academia-2012>). Vienna is frequently ranked the world's best city to live. It is a United Nations city with a large English-speaking community. The official language at CeMM is English, and more than 40 different nationalities are represented at the institute. CeMM promotes equal opportunity and harbors a mix of different talents, backgrounds, competences, and interests. Scientific positions at CeMM are paid according to the Austrian Science Fund's salary scheme.

*Please apply online: <https://cemm.jobbase.io/job/gaw4on1f> with cover letter, CV, academic transcripts, and contact details of three referees. Applications will be reviewed on a rolling basis. Any application received by 31 August 2019 will be considered. Start dates are flexible.*

### Additional information

City	Vienna
Position type	Part-time employee
Start of work	01.10.2019

### Responsible

Christoph Bock

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