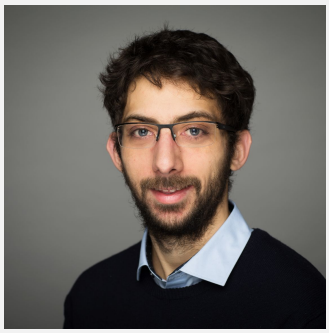
KEVIN RUE-ALBRECHT

Computational Biologist (Dipl. Ing., Ph.D.)

I am a computational biologist at the University of Oxford.

My research interests in computational biology include software engineering best practices, DevOps, single-cell genomics, and interactive data visualization. I particularly enjoy using and contributing R packages as part of the Bioconductor project. A list of software packages that I maintain or contributed to is available on the "Software" page of my website.

My academic research primarily explores the host immune response to infectious diseases, inflammation, and self-antigens.



EDUCATION

2015 — **University College Dublin**
Ph.D. in Computational Infection Biology — Dublin, Ireland

Thesis: Comparative systems biology analyses of the bovine transcriptional response to species of the *Mycobacterium* genus.

- *Bioconductor* package for Gene Ontology (GO) analysis of gene expression data (`GOexpress`).

2011 — **École Polytechnique Universitaire Polytech Nice-Sophia**
Ingénieur diplômé, MSc — Sophia Antipolis

- Pharmacology
- Biotechnology
- Toxicology
- Environmental Safety
- Bioinformatics

Major: Bioinformatics and Modelling for Biology

2008 — **CPGE BCPST Véto - Lycée Jean Rostand**
Class Préparatoire aux Grandes Écoles — Strasbourg, France

- Biology
- Chemistry
- Physics
- Earth Sciences
- Mathematics
- Programming

RESEARCH EXPERIENCE

2020-present — **Postdoctoral Researcher - Computational Biologist**
Sims Group, MRC WIMM Centre for Computational Biology, University of Oxford
Oxford, UK

- Development and delivery of training materials to cohorts of trainees as part of the Oxford Biomedical Data Science Training Programme.
- Development of novel bioinformatics tools and pipelines following software engineering best practices.
- Contribution to scientific reports and publications.

CONTACT INFO

kevinrue67@gmail.com
github.com/kevinrue

For more information, please contact me via email.

SKILLS

Experienced in statistical analysis, genomics, and software engineering.

Full experience with next generation sequencing data analysis.

Highly skilled in R, Bash, Python, with experience in C#, JavaScript, HTML, SQL, PHP, CSS, LaTeX, Perl, and Matlab.

*This resume was made with the R package **pagedown**.*

A PDF version is available here.

Last updated on 2021-08-26.

2017-2020

Postdoctoral Researcher - Computational Biologist
Sansom Group, Kennedy Institute of Rheumatology, University of Oxford

Oxford, UK

- Molecular pathogenesis of inflammatory bowel disease, in collaboration with the Powrie Group.
- Role of thymic epithelial cells in T-cell development, in collaboration with the Holländer Group and Ponting Group.
- Contribution to software pipelines for single-cell genomics data analysis (sansomlab/tenx).
- *Bioconductor* package for interactive exploration of `SummarizedExperiment` objects (`iSEE`).
- R package for the analysis of ChIP-seq data (kevinrue/deeperTools).

2016 | 2017

Postdoctoral Researcher - Computational Biologist
Ratcliffe group, Target Discovery Institute, University of Oxford

Oxford, UK

- Management and quality control of genomics data for analyses of DNA targeted resequencing, ChIP-seq, RNA-seq in the context of oxygen sensing and renal cancer.
- Prototype of MeteorJS application to manage sequencing data (kevinrue/Seqbook).

2015 | 2016

Research associate - Bioinformatics & Biostatistics
Prof. Martin Wilkins's Group, Imperial Centre for Translational and Experimental Medicine, Imperial College London

London, UK

- Integration of genetic variation, proteomic and metabolomics data and associated deep phenotype data, in collaboration with the Morrell Group.
- *Bioconductor* package for the analysis of genetic variants (`TVTB`).

Apr. 2012 | Jul. 2012

Ph.D. student - Computational Infection Biology, rotation 3
Prof. James O'Gara's Group, UCD Science Centre North

Dublin, Ireland

- Evaluation of a gene candidate underlying *Staphylococcus aureus* antibiotic resistance by Sanger sequencing and biofilm assay

Jan. 2012 | Apr. 2012

Ph.D. student - Computational Infection Biology, rotation 2
Dr Neil Ferguson's Group, UCD Conway Institute

Dublin, Ireland

- Expression and purication of a Hepatitis B protein construct for experimental screening of interacting drug fragments.

Sep. 2011 | Jan. 2012

Ph.D. student - Computational Infection Biology, rotation 1
Shields Lab, UCD Complex and Adaptive Systems Laboratory (CASL)

Dublin, Ireland

- *In silico* structure-based prediction of *Mycobacterium bovis* epitopes in cattle (supervisor: Dr. Anthony Chubb).

Jun. 2010 | Sep. 2010

Research Assistant - Computational Biology, intern
Shields Lab, University College Dublin

Dublin, Ireland

- Computational analysis of structural disorder in *Saccharomyces cerevisiae* interacting proteins.

Jul. 2009 | Aug. 2009

Research Assistant, intern
INSERM, Unité Mixte de Recherche S725, Biologie des Cellules Dendritiques Humaines
Strasbourg, France

• Recombinant protein expression of MHC class II molecules in HeLa cells.

PROFESSIONAL EXPERIENCE

Apr. 2011 | Jul. 2011

Software developer, intern
MEDIT S.A. — Palaiseau, France

• Implementation of structurally-constrained multiple alignment of protein sequences for the commercial software MED-SuMo.

TEACHING EXPERIENCE

2021 | present

Bioconductor teaching committee
Bioconductor, The Carpentries — Google Meet (online)

Development of online lessons in The Carpentries lesson incubator. Lead developer of the lesson The Bioconductor project.

2020 | present

Oxford Biomedical Data Science training programme
University of Oxford — Microsoft Teams (online)

Full-time trainer for a course of four to seven weeks run three times a year. Lessons cover Unix, Python and R for data science and biomedical research.

2020

Intuitive interactive data exploration with iSEE
Swiss Institute of Bioinformatics — Zoom (online)

Co-organizer of a 2h30 workshop at the SIB Days 2020.

2019 | present

R Code Clinic
Big Data Institute, University of Oxford — Oxford, UK

Volunteer to sit with individuals and assist them with any R problems they need help with. Website: https://bdicodeclub.netlify.com/.

2019

Interactive visualisation of SummarizedExperiment objects using iSEE
Bioconductor conference 2019 — New York, USA

Co-instructor of a 2-hour workshop at the Bioconductor conference 2019.

2014

Molecular Genetics and Biotech
University College Dublin — Dublin, Ireland

Teaching assistant of BMOL20090 at University College Dublin.

2014

Agricultural Microbiology
University College Dublin — Dublin, Ireland

Teaching assistant of MICR20010 at University College Dublin.

FUNDING AND AWARDS

2019 **RStudio Shiny Contest**
Winner of the “Most technically impressive” prize.

2019 **Bioconductor 2019 conference**
Conference fee waiver and travel grant for BioC 2019.
New York, USA
- Instructor of a 2-hour workshop at the Bioconductor conference 2019.
- Co-organiser of the Special Interest Group (SIG) Extending gene set and signature representations.

2017 **Bioconductor 2017 conference**
Conference fee waiver and travel grant for BioC 2017. Boston, USA
- Flash presentation for `TVTB`.
- Flash presentation for `GOexpress`.

2015 **ISMB/ECCB conference**
Conference fee waiver Dublin, Ireland
23rd Annual International Conference on Intelligent Systems for Molecular Biology (ISMB) and 14th European Conference on Computational Biology (ECCB). Special Interest Group (SIG) Bioinformatics Open Source Conference (BOSC).

2014 **5th Annual PhD Symposium in Computational Biology & Innovation**
Best oral presentation Dublin, Ireland

2011 **Wellcome Trust Four-year PhD Programme**
Computational Infection Biology Dublin, Ireland
Title: Transcriptome analysis of the bovine macrophage response to *Mycobacterium tuberculosis* complex strains.

ORGANISER AND CHAIR

2021 **Bioconductor conference 2021**
Conference website. Airmeet (online)
Co-organiser and point of contact for the coordination and testing of live workshops.

2020 **European Bioconductor conference 2020**
Conference website. Airmeet (online)
Co-organiser, session chair, and support for the coordination and testing of live workshops.

2019 **Special Interest Group**
Bioconductor conference 2019. New York, USA
Topic: Extending gene set and signature representations.

2018-2020 **Genomics Forum**
Kennedy Institute of Rheumatology, University of Oxford Oxford, UK
Coordinator of a weekly meeting to present and discuss ongoing projects in the institute.

2013 | 2014

Bioinformatics Seminar
University College Dublin — Dublin, Ireland
Co-organiser of a weekly meeting to present and discuss ongoing projects in the university.

2012

Computational Biology and Innovation PhD Symposium
University College Dublin — Dublin, Ireland
Co-organiser in charge of sponsorships and the abstract book.

TRAINING AND COURSES

2016

Machine Learning
Coursera, Stanford University

2015

Bioconductor for Genomic Data Science
Coursera, Johns Hopkins University
This course is part of the Genomic Data Science Specialization.

2015

Command Line Tools for Genomic Data Science
Coursera, Johns Hopkins University
This course is part of the Genomic Data Science Specialization.

2015

Python for Genomic Data Science
Coursera, Johns Hopkins University
This course is part of the Genomic Data Science Specialization.

2015

Statistics for Genomic Data Science
Coursera, Johns Hopkins University
This course is part of the Genomic Data Science Specialization.

2014

Teaching in Higher Education
University College Dublin — Dublin, Ireland

2013

Hot Topics in Food and Nutrition Research
University College Dublin — Dublin, Ireland

2013

Sequence Data Analysis Training
Wageningen Institute of Animal Sciences — Wageningen, Netherlands

2013

Network Analysis in Systems Biology
Coursera, Icahn School of Medicine at Mount Sinai

2012

Introductory Statistics using R for Computational Biologists
University College Dublin — Dublin, Ireland

2012

Python Programming for Computational Biologists
University College Dublin — Dublin, Ireland

2012

Online Research Skills for Computational Biologists
University College Dublin — Dublin, Ireland

2012

Advances in Infection Biology
University College Dublin — Dublin, Ireland

2012

Bioinformatics Research Seminars
University College Dublin — Dublin, Ireland

2012 **Genomics – Principles and Practical Applications**
University College Dublin — Dublin, Ireland

PROFESSIONAL MEMBERSHIPS

2021 | present **Bioconductor Community Advisory Board**
http://www.bioconductor.org/about/community-advisory-board/

2012 | present **International Society for Computational Biology (ISCB)**
https://www.iscb.org/

PEER REVIEW

2021 | present **NAR Genomics and Bioinformatics**
https://academic.oup.com/nargab
1 article

2019 | present **OUP Bioinformatics**
https://academic.oup.com/bioinformatics
2 articles

2019 | present **Journal of Open Source Software**
https://joss.theoj.org/
2 articles

SELECTED PUBLICATIONS AND POSTERS

2019 **Orchestrating single-cell analysis with Bioconductor.**
Nat Methods.
Amezquita, R. A., A. T. L. Lun, E. Becht, V. J. Carey, L. N. Carpp, L. Geistlinger, F. Marini, **K. Rue-Albrecht**, D. Risso, C. Soneson, L. Waldron, H. Pages, M. L. Smith, W. Huber, M. Morgan, R. Gottardo and S. C. Hicks

2019 **The Short Chain Fatty Acid Butyrate Imprints an Antimicrobial Program in Macrophages**
Immunity.
Schulthess, J., S. Pandey, M. Capitani, **K. C. Rue-Albrecht**, I. Arnold, F. Franchini, A. Chomka, N. E. Ilott, D. G. W. Johnston, E. Pires, J. McCullagh, S. N. Sansom, C. V. Arancibia-Carcamo, H. H. Uhlig and F. Powrie

2018 **iSEE: Interactive SummarizedExperiment Explorer.**
F1000Res.
Rue-Albrecht, K., F. Marini, C. Soneson and A. T. L. Lun

CONFERENCE PRESENTATIONS

2021 **Bioconductor**
Oral presentations. Airmeet (online)
- Introduction to workshops - Informal welcome: Opening talk for the conference.
- Talk: `velociraptor`, a Bioconductor toolkit for single-cell RNA velocity.
- Bioconductor 20th anniversary: Set up an automated repository converting community contributions into an HTML slide deck.

2019 **Bioconductor**
Oral presentations. New York, USA
- Talk: Interactive and reproducible visualization of `SummarizedExperiment` objects.
- Workshop: Interactive visualization of `SummarizedExperiment` objects with `iSEE`.
- Special Interest Group: Extending gene set and signature representations.

2018 **Genome Informatics**
Poster. Cambridge, UK
Title: Promiscuous expression of lincRNAs in medullary thymic epithelial cells

2017 **NGS-SIG - Single-cell RNA-seq**
Oral presentation. Oxford, UK
Title: Variability of human dendritic cells responses to differentially invasive Salmonella strains at single-cell level.

2017 **Bioconductor**
Oral presentations. Boston, USA
- `GOexpress`: Visualise and summarise gene expression data using Gene Ontology
- `TVTB`: The VCF Tool Box: an effort to summarise and visualise variants

2015 **Quantitative Genomics**
Poster. London, UK
Title: `GOexpress`: A R/Bioconductor package for the identification and visualisation of robust gene ontology signatures through supervised learning of gene expression data.

2015 **BOSC - ISMB/ECCB conference**
Oral presentation and poster. Dublin, Ireland
- Talk `GOexpress`: A R/Bioconductor package for the identification and visualisation of robust gene ontology signatures through supervised learning of gene expression data.
- Poster `GOexpress`: Identify and visualise gene expression using supervised learning and Gene Ontology.

2014 **Society for General Microbiology (SGM)**
Poster. Dublin, Ireland
Title: Microarray analysis of the bovine macrophage response to *Mycobacterium bovis*, *M. bovis* Bacille Calmette-Guérin (BCG) and *M. avium* subspecies *paratuberculosis*.

2014 **Virtual Institute of Bioinformatics & Evolution (VIBE)**
Oral presentation. Carlow, Ireland
Title: The quest for meaningful visualisation of genome-wide expression data.

2014 **EMBO conference: Microbiology after the genomics revolution - Genomes 2014**
Poster. Paris, France
Title: Transcriptome analysis reveals differential innate immune response to members of the *Mycobacterium tuberculosis* complex.

2014 **The Acid Fast Club, Summer Meeting**
Oral presentation. Berlin, Germany
Title: Transcriptome analysis reveals differential innate immune response of bovine macrophages to strains of the *Mycobacterium tuberculosis* complex.

2014 **UCD Conway Festival of Research & Innovation**
Poster. Dublin, Ireland.
Title: Transcriptome analysis reveals differential innate immune response to members of the *Mycobacterium tuberculosis* complex.

2014 **Wellcome Trust Final Year PhD Students' Meeting**
Poster. London, UK
Title: Transcriptome analysis reveals differential innate immune response to members of the *Mycobacterium tuberculosis* complex.

2013 **Association of Veterinary Teachers and Research Workers (AVTRW)**
Oral presentation. Hillsborough, Ireland
Title: Systems Biology of Host-Pathogen Interactions and Bovine Tuberculosis - Differential transcriptional response of bovine monocyte-derived macrophages following different mycobacterial infections

2013 **Animal Health Ireland Workshop & Conference**
Poster. Rochestown Park Hotel, Cork
Title: Microarray analysis of the bovine macrophage response to *Mycobacterium bovis*, *M. bovis* Bacille Calmette-Guérin (BCG) and *M. avium* subspecies *paratuberculosis*.

2013 **Virtual Institute of Bioinformatics and Evolution (VIBE)**
Oral presentation. Galway, Ireland
Title: Systems Biology of Host-Pathogen Interactions and Bovine Tuberculosis - Differential transcriptional response of bovine monocyte-derived macrophages following different mycobacterial infections.

2013 **Computational Biology & Innovation Symposium**
Poster. Dublin, Ireland
Title: Microarray analysis of the bovine macrophage response to *Mycobacterium bovis*, *M. bovis* Bacille Calmette-Guérin (BCG) and *M. avium* subspecies *paratuberculosis*.

2013 **Dublin Academy of Pathogenomics & Infection Biology (DAPI)**
Poster. Dublin, Ireland
Title: Microarray analysis of the bovine macrophage response to *Mycobacterium bovis*, *M. bovis* Bacille Calmette-Guérin (BCG) and *M. avium* subspecies *paratuberculosis*.

LANGUAGE

- **French**
  Native.
- **English**
  Fluent. TOEIC score 970.
- **Italian**
  Working knowledge.
- **Spanish**
  Limited. Used to be fluent though ☹.
- **German**
  Limited. Haven't practiced in a long time.