# 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 — **Computational Biologist - Biomedical Data Science trainer**
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 2021-11-25.*

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.