Bioconductor Notes, Autumn 2022

by Bioconductor Core Developer Team

Abstract We discuss the release of Bioconductor 3.16, along with educational activities and general project news.

1 Introduction

Bioconductor provides tools for the analysis and comprehension of high-throughput genomic data. The project has entered its twentieth year, with funding for core development and infrastructure maintenance secured through 2025 (NIH NHGRI 2U24HG004059). Additional support is provided by NIH NCI, Chan-Zuckerberg Initiative, National Science Foundation, Microsoft, and Amazon. In this news report, we give some details about the software and data resource collection, infrastructure for building, checking, and distributing resources, core team activities, and some new initiatives.

2 Software

Bioconductor 3.16 was released on 2 November, 2022. It is compatible with R 4.2 and consists of 2183 software packages, 416 experiment data packages, 909 up-to-date annotation packages, 28 workflows, and 3 books. Books are built regularly from source and therefore fully reproducible; an example is the community-developed Orchestrating Single-Cell Analysis with Bioconductor. The Bioconductor 3.16 release announcement includes descriptions of 71 new software packages, 9 new data experiment packages, 2 new annotation packages, and updates to NEWS files for many additional packages.

3 Core team updates

- New developer Robert Shear of the Department of Data Science at Dana-Farber Cancer Institute has joined the Bioconductor Core Developer Team.
- Robert is joined by long-term core members Lori Kern of Roswell Park Comprehensive Cancer Center, Marcel Ramos of CUNY and Roswell, Herv'e Pages of Fred Hutchinson Cancer Research Center, Jennifer Wokaty of CUNY, and Alex Mahmoud at Channing Division of Network Medicine.

4 Educational activities and resources

Engagement with The Carpentries

In August 2022, Bioconductor joined The Carpentries. Details and opportunities for receiving training on teaching are discussed in this blog post. We are currently inviting applications to become a Bioconductor Carpentries instructor through this form and particularly encourage people who could teach underserved communities in their local languages to apply.

Three lessons are under development in the Carpentries incubator: Introduction to data analysis with R and Bioconductor, RNA-seq analysis with Bioconductor and The Bioconductor project. We welcome any contributions, feedback or testing of the material.

Anyone is welcome to join the #education-and-training channel in Bioconductor Slack or the monthly Bioconductor Teaching Committee meetings to learn more.

YES for CURE

The Dana-Farber/Harvard Cancer Center Young Empowered Scientists program included a module on cancer data science for Summer 2022 participants. Materials presented are assembled at a pkgdown site; contact Vince Carey for information on an interactive deployment of these materials.

5 Using Bioconductor

Start using Bioconductor by installing the most recent version of R and evaluating the commands

```
if (!requireNamespace("BiocManager", quietly = TRUE))
    install.packages("BiocManager")
BiocManager::install()
```

Install additional packages and dependencies, e.g., SingleCellExperiment, with

```
BiocManager::install("SingleCellExperiment")
```

Docker images provides a very effective on-ramp for power users to rapidly obtain access to standardized and scalable computing environments. Key resources include:

- bioconductor.org to install, learn, use, and develop Bioconductor packages.
- A list of available software linking to pages describing each package.
- A question-and-answer style user support site and developer-oriented mailing list.
- A community slack workspace (sign up) for extended technical discussion.
- The F1000Research Bioconductor gateway for peer-reviewed Bioconductor workflows as well as conference contributions.
- The Bioconductor YouTube channel includes recordings of keynote and talks from recent conferences including BioC2022, EuroBioC2022, and BiocAsia2021, in addition to video recordings of training courses.
- Our package submission repository for open technical review of new packages.

Upcoming and recently completed conferences are browsable at our events page.

The Technical and and Community Advisory Boards provide guidance to ensure that the project addresses leading-edge biological problems with advanced technical approaches, and adopts practices (such as a project-wide Code of Conduct that encourages all to participate. We look forward to welcoming you!

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