



Summary Report: Bioinformatics Needs Assessment

Data Science Platform, George & Fay Yee Centre for Healthcare Innovation
University of Manitoba
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Introduction:

The aim of the Bioinformatics Needs Assessment Survey was to identify the needs for omics data analysis support and training amongst researchers and trainees at the University of Manitoba. This document contains a summary of the methods and results of the Bioinformatics Needs Assessment Survey.

Results from the Bioinformatics Needs Assessment will be used to plan the future of Bioinformatics data analysis support and training resources and services offered by the George & Fay Yee Centre for Healthcare Innovation (CHI) and in the Rady Faculty of Health Sciences (RFHS).

Methods:

In collaboration with the Evaluation Platform, two versions of an on-line survey (short and full length) were developed to categorize respondents into three groups: current users, future users, and non-users. Current users were defined as the respondents who generate/use one or more types of omics data (e.g. genomic, proteomic, microbiome data, etc.) in their research projects. Future users were defined as respondents not currently generating/using omics data but are considering using it in future research. Non-users were those who neither currently use nor plan to use any omics data in their research projects. The current users were invited to complete the full survey, the future users were asked to complete the short survey; minimal data were collected from the non-user group.

Results:

Sixty-two researchers, who currently have a position or appointment in the Rady Faculty of Health Sciences were invited by an email containing a link to the survey. A total of 41 (66% response rate) respondents completed a survey. Among all respondents, 24 respondents (58.5%) were researchers at the University of Manitoba, 8 respondents (19.5%) were staff, and 9 respondents (22%) were trainees (graduate students and post-doctoral fellows).

Based on their answers to screening questions, out of 41 respondents, 32 respondents (78%) were identified as current users, and 6 respondents (15%) were identified as future users. Only 3 respondents (7%) were non-users.

Among the respondents, the results revealed that:

1. Genomic data (RNA sequencing: 53%, mRNA gene expression: 44%, DNA sequencing: 34%), and proteomic data (34%) were selected as the types of omics data that current users are generating/using for their research.
2. Most respondents choose to have their omics data analyzed by member(s) of their local research team (66%), followed by sending the data to either a collaborator (53%) and/or an external data analysis service (28%). For the users who have and/or had experience in outsourcing their omics data, the majority of respondents (78%) indicated that they paid fixed prices for full projects.
3. Finding a bioinformatician/statistician to help and/or perform data analysis, and getting sufficient training on using analytics software/tools were selected as the main current challenges in analyzing and managing the omics data.
4. The common storage system is laboratory/PI's computers/laptops/external hard drives (72%), followed by the servers provided by the Max Rady College of Medicine (31%).
5. There was a demonstrated interest in bioinformatics training on several topics including data visualization (53%), basic statistics for biologists (50%), data analysis using Ingenuity Pathway Analysis (IPA) software, and database and data management tools (47%). In addition, hands-on workshops (75%) was selected as the most preferred training format followed by lectures/short courses (56%), and online tutorials (47%).
6. Future users identified that the lack of bioinformatics/statistical knowledge and skills to analyze omics data (83%), the need to access a high performance computing system (50%), as well as appropriate secure data storage (50%) were the key challenges that delayed them from using omics data in research projects.

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Current Resources and Services Available through CHI:

The Data Science Platform serves as a resource of statistical and analytical expertise for researchers and trainees at the University of Manitoba's Bannatyne Campus.

Consultation services:

Our professional biostatisticians and bioinformaticians can provide expert advice and assistance in the analyses of large omics datasets. These services include:

- Developing grant proposals
- Study design and analytical planning
- Sample size and power calculations
- Statistical analyses
- Interpretation/presentation of results

We offer fee-for-service consulting for researchers, clinicians, trainees. Some consulting is available free of charge including study design, sample size, and analysis planning in support of grant submissions. Also, medical residents and trainees have access to subsidized (i.e., no-cost) consulting services of up to 5 hours for their projects.

For inquiries, please complete our intake form: <https://chimb.ca/pages/16-contact-us>

Educational resources and training:

The Data Science Platform offers a wide range of training sessions from basic statistics workshops through to sessions on advanced analytical techniques for analyzing large complex health data. For example:

- Workshops in Statistical Programming:
 - R for Absolute Beginners (spring 2018)
 - Using R for Basic Statistics (summer 2018)
 - SAS for Intermediate Users (winter 2019)
- Supercomputing User Training workshop (fall 2018)
- Gene Set Analysis using Omics Data workshop (fall 2018)
- CIHR STAGE (Strategic Training for Advanced Genetics Epidemiology) International Speaker Seminar (monthly; will resume in fall 2018)
- Graduate course: Medical Computational Biology (IMED 7280)
(http://umanitoba.ca/faculties/engineering/departments/ece/media/outlines/IMED7280_ROASS_SYLLABUS_PHu2.pdf)
- Precision Health Informatics and Analytics Journal Club and Research Seminar Series:
This is a revitalization of the bioinformatics journal club, where participants will deconstruct a selected bioinformatics-related publication (provided by a research team) and engage in discussion about study objectives, methods, and analysis. This Journal Club is expected to begin in fall 2018.

For more information:

For information about the Bioinformatics Needs Assessment, please contact:

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