CISR Facility Description and Support:

CISR provides world class expertise spanning from bioinformatics to the analysis of electronic health records (EHRs), which covers the broad spectrum of needs of UWCCC members. Members have access to state-of-the-art high throughput experimental techniques, and consequently generate a wide array of large, complex data sets. For each data set, CISR staff and faculty can identify and run accurate and efficient computational approaches for its analysis. Examples of data types supported are those from mass spectrometry proteomics and metabolomics, flow cytometry, imaging, natural language text (e.g., EHRs), and sequencing assays including RNA-Seq, ChIP-Seq, DNA-seq, single cell-seq, DNA methylation, Hi-C, and metagenomics. Analyses supported include variant calling, differential expression, functional and pathway analysis, sequence alignment and assembly, neoepitope discovery, mutational burden, and T-cell repertoire.

CISR informatics support is provided by a highly skilled and experienced team consisting of five PhD scientists and four faculty based in the Biostatistics and Medical Informatics (BMI) department. One of the scientists, Dr. Sean McIlwain, serves as Facility Manager. The CISR faculty are Drs. Mark Craven, Colin Dewey, Irene Ong, and Sushmita Roy. As part of their role within CISR, Dr. McIlwain and the four faculty provide mentoring to the CISR scientists.
To facilitate UWCCC member use of standardized pipelines, such as for high throughput sequencing applications, CISR develops and deploys pipelines via a collaboration with the Bioinformatics Resource Center (BRC), a core within the University of Wisconsin Biotechnology Center. The CISR and BRC scientists coordinate with other data-generating cores to develop new pipelines needed by members. CISR also works synergistically with the Biostatistics Shared Resource (BSR), whose staff are experts in statistical data analysis and experimental design.

CISR has an office, WIMR 6139, in the Wisconsin Institute for Medical Research Tower I (WIMR I), where the scientists work alongside most UWCCC members. High throughput computing facilities, a key component of meeting member needs, are provided by the BMI department's Biomedical Computing Group (BCG) and are capable of handling human subjects data. BCG resources for CISR use include 540TB of storage and a computing cluster with over 2900 cores. A full complement of software tools, such as Bioconductor and scikit-learn, is supported by the BCG.

CISR provides informatics services as part of both the initial and long-term support of UWCCC member projects. Initial support provided by CISR includes analysis of data from pilot studies to generate preliminary results, inform study design, and facilitate grant application development. CISR staff provide long term collaborative support through dedicated effort on members' funded projects. In addition, CISR develops and facilitates use of standardized computational pipelines, which support both short- and long-term efforts. Pipelines include those for DNA and RNA sequencing, DNA footprinting, metagenomics, and protein structure prediction.