

## Neuroinformatics

Neuroinformatics is the application of computational methods and information technology to do research on the nervous system. The interdisciplinary and high-technology approaches used in Kids Brain Health Network's research generate vast quantities of data that no human can handle or understand without the help of a computer. Kids Brain Health thus requires sophisticated mechanisms for the collection, management, storage, distribution, and analysis of numerous types of data coming from multiple sites across Canada. The Neuroinformatics core was established to meet these needs.

The core is establishing databases, software and web resources for Kids Brain Health, working closely with the ASD, CP and FASD project research teams, to help handle the challenges posed by large quantities of clinical, brain imaging, and genetics data. The core is situated as a key hub between the projects, working to connect information about multiple aspects of brain development, and to help identify relationships among neurodevelopmental disorders. By advancing the ability to collect, query and analyze huge quantities of complex data, the Neuroinformatics core plays an important role in mining new knowledge from the research in Kids Brain Health. Our long-term goal is to give brain development researchers the ability to effectively use data not just from Kids Brain Health, but information from research conducted by researchers anywhere in the world.

## Neuroinformatics programs

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### Cerebral Palsy Registry

Working closely with Kids Brain Health Network's Cerebral Palsy (CP) demonstration project, our Neuroinformatics team has established the Canadian CP Registry. The database allows researchers to centralize data across all eight provinces currently participating in a trans-Canadian CP registry project led by Kids Brain Health.

### Phenocarta Database Enables Comparisons Among NDDs

Our Neuroinformatics team is addressing the gap between the huge amounts of previously collected genomics data on neurodevelopmental disorders (NDDs), and researchers' ability to make use of those data with a new web-based resource. Phenocarta, also known as Neurocarta, a powerful searchable database, allows researchers to find information about the genes implicated in neurodevelopmental disorders and other diseases, based on multiple sources of data and the team's novel analyses.

Phenocarta helps researchers gain insight into the molecular and genetic origins and susceptibilities that lead to neurodevelopmental disorders, and will contribute to the development of novel biomarkers, diagnostics and treatment strategies. An article on the team's work with Phenocarta was published in February 2013 in [BMC Genomics](#) [1].

### Advancing neuroinformatics and standardized data management

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Kids Brain Health Network is playing a key role in advancing the field of neuroinformatics in Canada. The Neuroinformatics team participated in the organization of several Canadian neuroinformatics workshops and spearheaded the creation of the association for Canadian Neuroinformatics and Computational Neuroscience (CNCN), as well as the development of a website, [www.neuroinfocomp.ca](http://www.neuroinfocomp.ca) [2] that includes a directory of more than 80 Canadian researchers.

Kids Brain Health's Neuroinformatics team has also taken a national leadership role in data management, with the objective of fostering better standardized practices and improved data quality in clinical research studies across Canada.

## Team Leads

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### Links:

[1] <http://neurodevnet.ca/sites/default/files/neurodevnet/NeuroCarta%20BMC%20Genomics%202013.pdf>  
[2] <http://www.neuroinfocomp.ca>  
[3] <mailto:paul@chibi.ubc.ca>  
[4] <mailto:alan@bic.mni.mcgill.ca>  
[5] <mailto:rogic@chibi.ubc.ca>