NeuroDevNet

WORKING TOGETHER
FOR **HEALTHY BRAINS**

New opportunities for ASD Research: NeuroDevNet

Lonnie Zwaigenbaum

Autism Research Team's Annual Parent Conference

January 15, 2011

Overview of NeuroDevNet

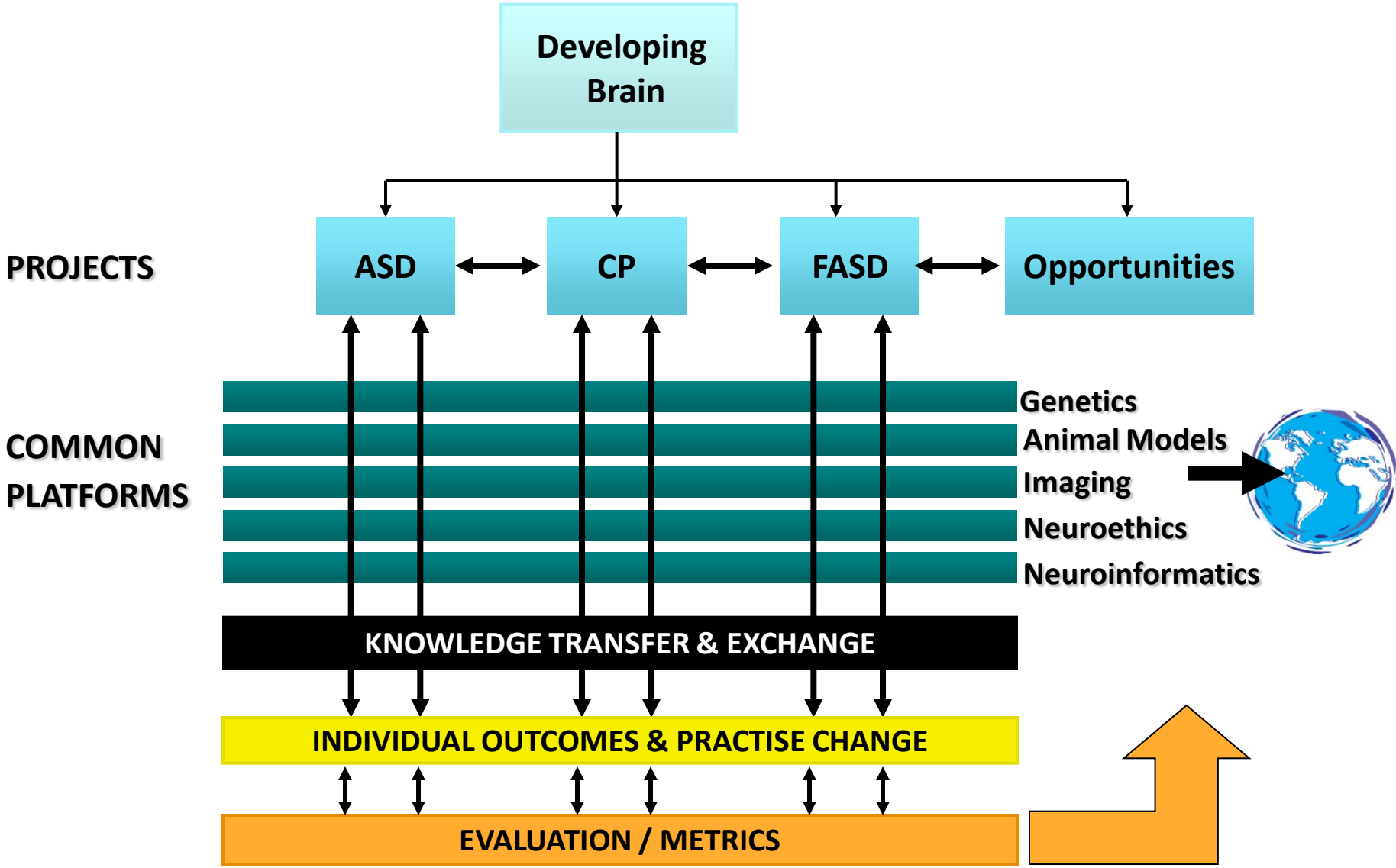
- NeuroDevNet is **a Canadian Network of Centres of Excellence** (NCE) **in brain development**.
- NeuroDevNet's mission is to:

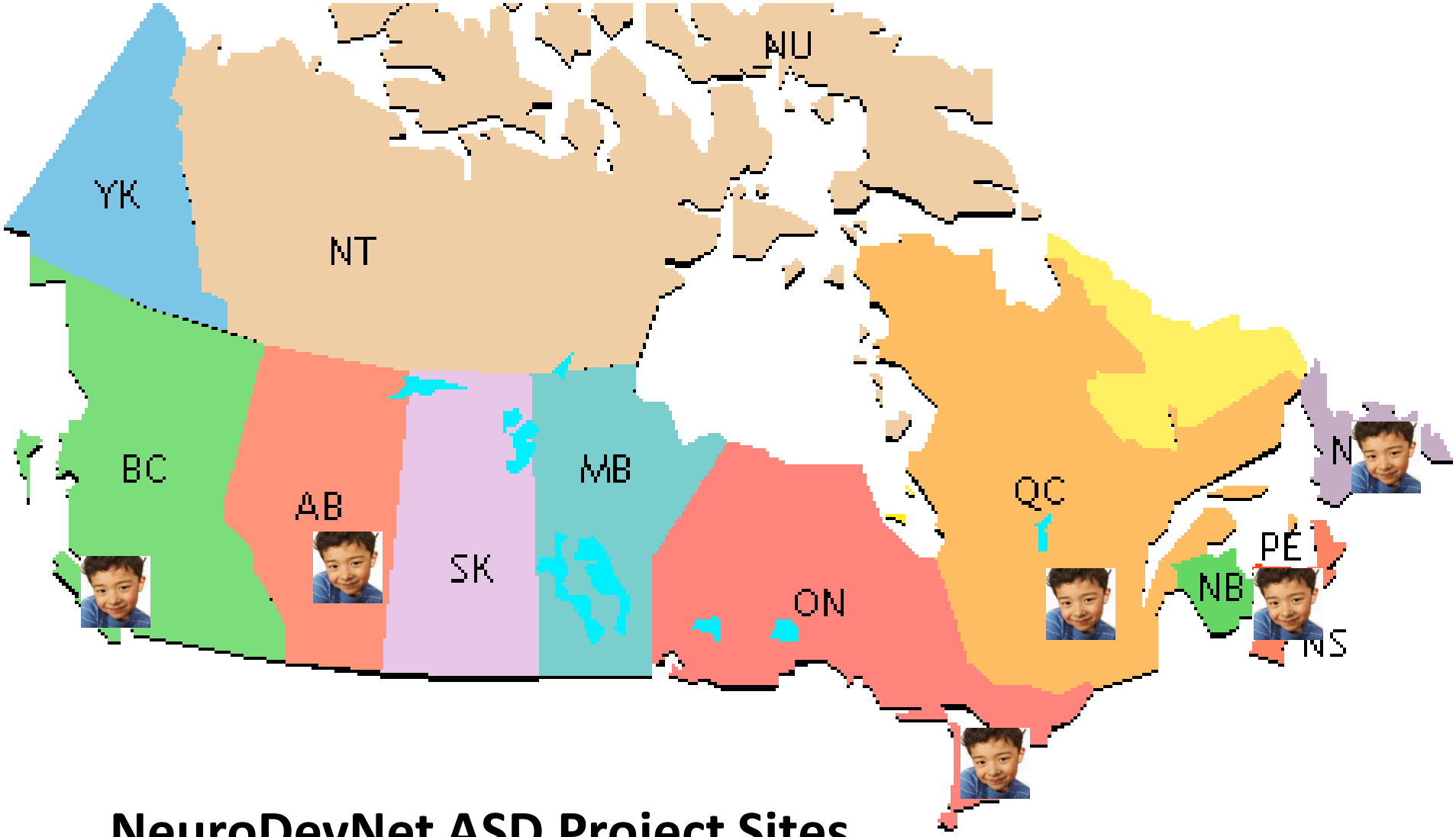
- Scientific Director: Dr. Dan Goldowitz, UBC

Selection of Initial Research Projects

- Three demonstration projects were selected
  - ASD, CP, and FASD
- Each project sheds light on the much larger spectrum of developmental conditions that affect Canadian children.
- Each condition reflects roles of genes, environment, and GxE in brain function.
- Each condition has significant socioeconomic impact
- Leading expertise available within Canada to allow the network to make major in-roads into understanding and treating each condition.

NeuroDevNet Research Operations



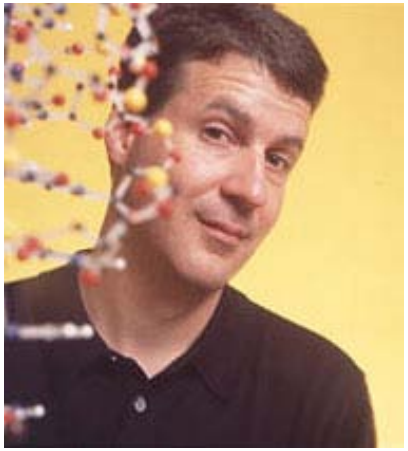


NeuroDevNet ASD Project Sites

- **brings together Can-A-Gen, Pathways and Infant Sibling Studies to investigate the genetics of brain and behavior development in ASD**

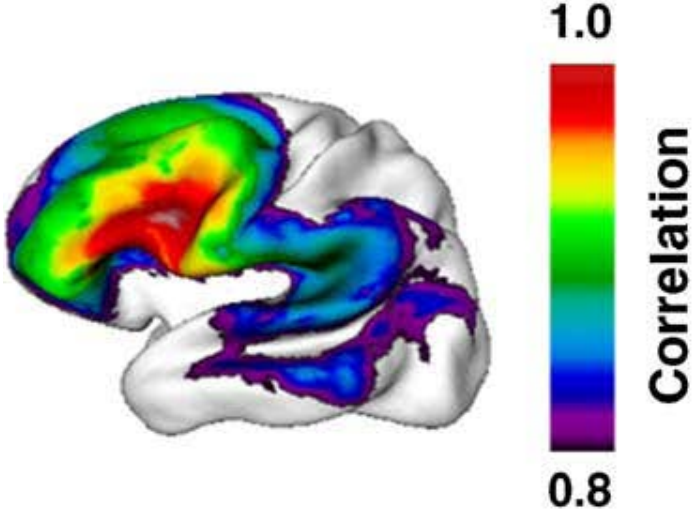
Project I: Gene Discovery

- Based in Toronto Centre for Applied Genomics (Dr. Scherer)
- Next-generation sequencing (NGS) will be used to identify genetic variants associated with ASD
- Includes families participating in Can-A-Gen
- Coordinated with similar NGS initiative in the US



Project II: Neuroimaging Study

- Focus on genetics of neuronal connectivity and brain morphology over the course of development
- Compare brain structure, function and connectivity in children with ASD, with and without CNVs, and controls
- Sites in Toronto and Montreal



Mapping Anatomical Correlations Across Cerebral Cortex (MACACC) from Evans, Hyde (Lerch et al., 2006)

Project III: Clinical Utility Studies

- **Early detection and diagnosis of ASD**
  - Do CNVs influence risk and early symptom expression in high-risk infant cohort?


- **Developmental trajectories of ASD**
  - Do CNVs influence developmental course, comorbidities and long-term outcomes in a longitudinal cohort of children with ASD?







Anticipated benefits

- Advances in discovery of ASD genes and how they influence development and clinical expression
- Better understanding of brain-behavior relationships in ASD and the influence of genetic factors
- Further dialogue re: clinical and ethical issues and development of best practice in incorporating new genomic testing into clinical practice
  - Potential for predictive testing?
- Long-term: potential for targeted interventions
- Opportunities for trainees focused on ASD research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