

Faculty – Research Interests

(as of January 26, 2010)

Faculty currently supervising, or interested in supervising, graduate students in Medical Genetics.

FACULTY	RESEARCH AREA
CHROMOSOME STRUCTURE & TRANSMISSION	
C.J. Brown, PhD	X chromosome inactivation. Gene regulation, chromatin modification, epigenetic silencing.
P. Hieter, PhD	Molecular biology of eukaryotic chromosome transmission.
M. Kobor, PhD	Chromatin, protein complexes, genome integrity, DNA replication and DNA microarrays.
P.M. Lansdorp, MD, PhD	Epigenetic differences between sister chromatids, role of guanine-rich DNA and telomeres in genome integrity, aging and cancer.
M.C. Lorincz, PhD	Interplay between transcription, DNA methylation and histone modifications in embryonic stem cells and tumorigenesis.
M.A. Marra, PhD	DNA sequencing; disease-associated mutation discovery; gene discovery; bioinformatics; cancer genomics; gene expression.
W.P. Robinson, PhD	Origins and consequences of chromosomal abnormalities in humans; placental development and reproductive outcomes.
A.M. Rose, PhD	C. elegans genetics, meiosis, metaphase-anaphase checkpoint, recombination, nondisjunction, pathogenomics.
DEVELOPMENTAL GENETICS, NEUROGENETICS & BIRTH DEFECTS	
C.F. Boerkoel, MD, PhD	Studying inherited human disorders to understand human development, behaviour, physiology and degeneration. Emphasis on neurological, neuromuscular, and psychiatric diseases. Objective is to improve care.
M. Coulter-Mackie, PhD	Inherited metabolic disease, peroxisomes, hyperoxaluria, chaperone interaction.
L.L. Field, PhD	Genetics of complex common traits. Mapping genes predisposing towards human disease including diabetes, dyslexia and cleft lip/palate.
D. Goldowitz, PhD	Neurological mutant mice are used as entrees into studying the genetics, cell biology and development of genes that are critical to nervous system development.
P.A. Hoodless, PhD	Early mammalian development, TGFbeta signal transduction, gene regulation, transgenic/knockout mice, whole genome profiling.
D.M. Juriloff, PhD	Genetics and embryology of multifactorial birth defects in mouse models. Cleft lip. Neural tube defects.
R.J. Kay, PhD	Lymphocyte development and lymphomagenesis.
B. Leavitt, MD	Neurogenetics, Huntington disease and other triplet repeat disorders, transgenic/knockout mice, mouse models of human neurodegenerative disease, experimental therapeutics.
L. Lefebvre, PhD	Role of imprinted genes in mammalian development. Epigenetics of embryonic stem cells and germ cell lineage. Gene targeting.

M.E.S. Lewis, MD	Genetic, genomic and comprehensive phenotyping studies for the autism spectrum disorders, idiopathic intellectual disabilities and other complex disorders of neurodevelopmental and/or behavioral disability.
W.P. Robinson, PhD	Origins and consequences of chromosomal abnormalities in humans; placental development and reproductive outcomes.
E.M. Simpson, PhD	Multidisciplinary; Genetics, Genomics, Neurosciences, and Gene Therapy. Human studies, mouse transgenic models, brain and eye disease, bipolar disorder and aniridia. Gene expression, transcription factors, Nuclear Receptor 2E1, stem/progenitor cells, neurogenesis, behaviour.
C. Van Raamsdonk, PhD	Genetics of pigmentation and melanoma; Regulation of cell survival, proliferation and differentiation; Mouse models; Dorsoventral patterning during development.

GENE REGULATION AND SIGNAL TRANSDUCTION

C.F. Boerkoel, MD, PhD	Study of the pathophysiology of inherited human disease. Identification of disturbed homeostatic networks provides the entry point for potential therapy and improving the care of patients.
C.J. Brown, PhD	X chromosome inactivation. Gene regulation, chromatin modification, epigenetic silencing.
E. Conibear, PhD	Vesicle trafficking, lipid transport, yeast genetics, functional genomics, and mammalian cell biology.
S. E. Dunn, PhD	Activation of transcription factor complexes by signaling pathways with a focus on the Pi3K/Akt network. Protein/DNA interactions characterized by chromatin immunoprecipitation (ChIP), ChIP on chip (promoter and genome-wide arrays), gel shift and site-directed mutagenesis.
W.T. Gibson, MD, PhD	Mendelian disorders of body weight regulation and their relevance to common obesity and metabolic syndrome. Transgenic/knockout mice with perturbations of energy intake and energy expenditure.
D. Goldowitz, PhD	The transcriptional networks which serve to guide the development and function of the cerebellum is a major effort in the lab.
X. Jiang, MD, PhD	Gene regulation, leukemic stem cell biology, basic and translational leukemia research, signal transduction, proteomics.
M. Kobor, PhD	Chromatin, protein complexes, genome integrity, DNA replication and DNA microarrays.
L. Lefebvre, PhD	Genomic imprinting in mammals. Epigenetic regulation of gene expression. Transcriptional silencing.
M.C. Lorincz, PhD	Interplay between transcription, DNA methylation and histone modifications in embryonic stem cells and tumorigenesis
D.L. Mager, PhD	Regulation of natural killer cell receptor genes, impact of transposable elements on mammalian genes, role of DNA methylation/epigenetics in gene expression.
M.A. Marra, PhD	DNA sequencing; disease-associated mutation discovery; gene discovery; bioinformatics; cancer genomics; gene expression.
E.M. Simpson, PhD	Multidisciplinary; Genetics, Genomics, Neurosciences, and Gene Therapy. Human studies, mouse transgenic models, brain and eye disease, bipolar disorder and aniridia. Gene expression, transcription factors, Nuclear Receptor 2E1, stem/progenitor cells, neurogenesis, behaviour.
S. Taubert, PhD	Gene regulation, transcription, regulatory complexes, and Hormone Receptors related to lipid metabolism, stress responses, and development in C. elegans and mammalian cells.

C. Van Raamsdonk, PhD	Genetics of pigmentation and melanoma; Regulation of cell survival, proliferation and differentiation; Mouse models; Dorsoventral patterning during development.
W.W. Wasserman, PhD	Analysis of regulatory control sequences in the human genome using bioinformatics.

GENOMICS AND BIOINFORMATICS

R. Brinkman, PhD	High throughput data analysis, data standards, flow cytometry, GvHD biomarker identification, cluster identification.
A.R. Brooks-Wilson, PhD	Genetics of human cancer susceptibility and disease resistance, particularly non-Hodgkin lymphoma, healthy aging and cervical cancer. Genetic epidemiology, genotyping, single nucleotide polymorphisms.
E. Conibear, PhD	Vesicle trafficking, lipid transport, yeast genetics, functional genomics, and mammalian cell biology.
S. E. Dunn, PhD	Activation of transcription factor complexes by signaling pathways focusing on the Pi3K/Akt network. Protein/DNA interactions characterized by chromatin immunoprecipitation (ChIP), ChIP on chip (promoter and genome-wide arrays), gel shift and site-directed mutagenesis.
C. Eaves, PhD	Characterization of the stem cell state and its control by comparative global gene expression and proteomics analyses.
D. Goldowitz, PhD	Genomics and bioinformatics are used to intelligently select genes derived from microarray analyses for further analysis and validation as key players in neural development and degeneration.
P. Hieter, PhD	Molecular biology of eukaryotic chromosome transmission.
S. Jones, PhD	Bioinformatics, gene expression, gene regulation, genome sequence analysis and genome assembly.
M. Kobor, PhD	Chromatin, protein complexes, genome integrity, DNA replication and DNA microarrays.
D.L. Mager, PhD	Roles of human transposable elements in genome evolution and gene regulation, endogenous retroviruses, comparative genomics, bioinformatics.
M.A. Marra, PhD	DNA sequencing; disease-associated mutation discovery; gene discovery; bioinformatics; cancer genomics; gene expression.
E.M. Simpson, PhD	Multidisciplinary; Genetics, Genomics, Neurosciences, and Gene Therapy. Human studies, mouse transgenic models, brain and eye disease, bipolar disorder and aniridia. Gene expression, transcription factors, Nuclear Receptor 2E1, stem/progenitor cells, neurogenesis, behaviour.
S. Taubert, PhD	Gene regulation, transcription, regulatory complexes, and Hormone Receptors related to lipid metabolism, stress responses, and development in <i>C. elegans</i> and mammalian cells.
W.W. Wasserman, PhD	Analysis of regulatory control sequences in the human genome using bioinformatics.
M. Wilkinson, PhD	Computer-readable representations of biological data and bioinformatics analysis services. Ethical implications of bioinformatics. Semantic Web Services in bioinformatics. The BioMOBY project (http://www.biomoby.org).

GENETIC EPIDEMIOLOGY AND HUMAN GENE MAPPING

A.R. Brooks-Wilson, PhD	Genetics of human cancer susceptibility and disease resistance, particularly non-Hodgkin lymphoma, healthy aging and cervical cancer. Genetic epidemiology, genotyping, single nucleotide polymorphisms.
C.F. Boerkoel, MD, PhD	Study of Mendelian human disorders using linkage analysis and chromosomal rearrangements. Identifying the molecular cause helps to understand pathophysiology leading to potential therapeutic targets.
L.L. Field, PhD	Genetics of complex common traits. Mapping genes predisposing towards human disease including diabetes, dyslexia and cleft lip/palate.
J.M. Friedman, MD, PhD	Clinical databases to study the pathogenesis of congenital anomalies and genetic diseases; risks related to a variety of human teratogens.
M. Hayden, FRSC, MB, ChB, PhD	Changes in specific genes that result in specific diseases, concentrating on Huntington disease and premature coronary artery disease.

IMMUNOGENETICS

R.J. Kay, PhD	Immunological selection of T and B cells, genetic determinants of lymphocyte development.
D.L. Mager, PhD	Regulation and genomic analysis of natural killer cell receptor genes. Role of epigenetics in transcriptional control of immune system genes.
W.R. McMaster, DPhil	Immunogenetics and Molecular Immunology. Cell surface proteins and Leishmania. Modulation of macrophage gene expression by M. tuberculosis.
K. McNagny, PhD	Stem cells, vasculature, adhesion, development, and transgenics.

STEM CELLS AND GENE THERAPY

L.A. Clarke, MD	Lysosomal storage disease and disorders of sulfate transport.
C.J. Eaves, PhD	Biology of stem cells (human ES, normal & malignant hematopoietic and breast), in vivo models of oncogenesis, gene therapy.
M. Hayden, FRSC, MB, ChB, PhD	Changes in specific genes that result in specific diseases, concentrating on Huntington disease and premature coronary artery disease.
R.K. Humphries, MD, PhD	Genetic control and manipulation of hemopoiesis. Stem Cell Regulation. Retroviral Gene Transfer. Transgenic Mice.
P.M. Lansdorp, MD, PhD	Stem cells, developmental control, telomere biology, self-renewal and genetic instability.
B. Leavitt, MD	Stem cells, neural regeneration and transplantation, somatic gene transfer and therapy, in vitro ES cell differentiation, transgenic/knockout mice, Huntington disease, neurogenetics.
M.E.S. Lewis, MD	Clinical genetic, neurodevelopmental and behavioural phenotype analysis, clinical and applied genotype/phenotype correlations, somatic gene transfer and therapy.
M.C. Lorincz, PhD	Interplay between transcription, DNA methylation and histone modifications in embryonic stem cells and tumorigenesis
K. McNagny, PhD	Stem cells, vasculature, adhesion, development, and transgenics.
F. Rossi, MD, PhD	Stem cells, regeneration, gene therapy, control of cell fate.
E.M. Simpson, PhD	Multidisciplinary; Genetics, Genomics, Neurosciences, and Gene Therapy. Human studies, mouse transgenic models, brain and eye disease, bipolar disorder and aniridia. Gene expression, transcription factors, Nuclear Receptor 2E1, stem/progenitor cells, neurogenesis, behaviour.

Pharmacogenomics *New*

[M. Hayden, FRSC, MB, ChB, PhD](#)

Description pending.

ETHICS AND POLICY

[M. Wilkinson, PhD](#)

Computer-readable representations of biological data and bioinformatics analysis services. Ethical implications of bioinformatics. Semantic Web Services in bioinformatics. The BioMOBY project (<http://www.biomoby.org>).