

Michael Smith Genome Sciences Centre

BCCA CANCER RESEARCH CENTRE

BCCA Cancer Research Centre Location
675 W 10th Ave, Vancouver BC, V5Z 1L3
Tel: 604-675-8150

Echelon Building Location
570 West 7th Ave- Suite 100, Vancouver, BC V5Z 4S6
Tel: (604) 707-5800



Our Research Focus:

Genome Sciences Centre (GSC) is an internationally-recognized state-of-the-art facility specializing in high-throughput genome research applying genomics and bioinformatics tools and technologies to cancer and disease research. Genome research includes large-scale DNA sequencing, bioinformatics, whole genome mapping, gene expression assays, BAC re-arrays, large-scale high-throughput transcript cloning, proteomics and technology development.

Specialized groups at the GSC focus on cancer genetics (polymorphism discovery and genotyping), programmed cell death, gastrointestinal cancers, prostate cancer, protein-protein interactions, gene expression regulation, brain disorders and mental illness, quality assurance, training, and project management.

The facility was designed specifically for flexibility and high throughput with a particular emphasis on efficiency and rapid scale-up. Research is carried out on the latest instrumentation, with data collected and analyzed on one of the most innovative and flexible bioinformatics computing facilities in the world.

Progress Highlights during 2005-2006:

- The Bioinformatics Training Program, headed by Dr. Steven Jones, became a full graduate program at the University of British Columbia in September 2006.
- The GSC contributed to the Bovine Genome Sequencing Project for the release of a comprehensive set of genomes into a freely accessible international public database.



Key Research Staff

<i>Researcher name</i>		<i>Position & Cross-Appointments</i>
Marco Marra	PhD Genetics	Director Associate Professor, Medical Genetics, UBC Adjunct Professor, Molecular Biology and Biochemistry, SFU Associate Member, Michael Smith Laboratories, UBC Senior Scientist, Cancer Genetics & Developmental Biology, BCCA
Steven Jones	PhD Genetics	Associate Director & Head, Bioinformatics Director, Bioinformatics Graduate Program, UBC Associate Member, Peter Wall Institute for Advanced Studies Adjunct Professor, University of Manitoba, Medical Microbiology & Infectious Diseases Associate Professor, Medical Genetics, UBC
Angela Brooks-Wilson	PhD Medical Genetics	Head, Cancer Genetics Assistant Professor, Medical Genetics, UBC
Stephane Flibotte	PhD Physics	Senior Scientist
Sharon Gorski	PhD Dev. Biology	Senior Scientist Assistant Professor, Medical Genetics, UBC Senior Scientist, Cancer Genetics & Developmental Biology, BCCA
Robert Holt	PhD Pharmacology	Head, Sequencing Adjunct Professor, Genetics Graduate Program, UBC Adjunct Professor, Psychiatry, University of Alberta Assistant Professor, Psychiatry, UBC
Martin Krzywinski	MSc Physics	Scientist
Gregg Morin	PhD Biochemistry	Head, Proteomics
Marianne Sadar	PhD Biochemistry	Program Leader, Prostate Cancer Research, BCCA Honorary Associate Professor, Surgery, UBC Associate Member, Pathology & Laboratory Medicine, UBC
Jacqueline Schein	MSc Genetics	Head, Mapping
Isabella Tai	MD, PhD Physiology	Senior Scientist Assistant Professor, Gastroenterology, UBC Active Staff, Vancouver Coastal Health Sciences Centre

Training

A.) Course Instruction

A Brooks-Wilson	UBC MEDGEN 505
A Brooks-Wilson	UBC MEDGEN 520
A Brooks-Wilson	UBC MEDGEN 545
A Brooks-Wilson	UBC HCEP 511

R Holt	UBC MEDGEN 505
S Jones	UBC MEDGEN 505
M Marra	UBC MEDGEN 420
M Marra	UBC MEDGEN 505
M Marra	UBC MEDGEN 521
M Sadar	UBC PATH 548
I Tai	UBC PGY 4-5 (Medical Oncology)
I Tai	UBC Medicine P2P2
I Tai	UBC Facilitator, Program-Based Learning, Gastroenterology section (Years 1, 2 Medicine)
I Tai	UBC Clinical Facilitator, Section: The GI System (Year 3, Medicine)

B.) Summary of Trainees & Awards

Total No. of Current Student	Postdoctoral Fellow	Graduate Student	Undergraduate	Clinical
37	8	20	8	1

Trainee Awards

Name	Supervisor	Award Received
So Yamada	A Brooks-Wilson	Ritsumekan University Graduate Scholarship (2006)
Johanna Schinas	A Brooks-Wilson	MSFHR Trainee Award (2006)
		NSERC CGS-M (2006)
		PA Maragonis Graduate Scholarship (2005)
Payal Sipahimalani	A Brooks-Wilson	UBC University Graduate Fellowship (2005)
Julius Halaschek-Weiner	A Brooks-Wilson	Austrian Schrodinger Fellowship (2004-2006)
Obi Griffith	S Jones	CIHR (CGS) Doctoral Award (2005)
		MSFHR Senior Trainee Award (2006)
Yvonne Li	S Jones	CIHR/MSFHR Bioinformatics Training Program (2004-2006)
		NSERC (CGS) Doctoral Award (2006-2009)
Malachi Griffith	M Marra	MSFHR Snr Scholarship (2006-2009)
		NSERC Post Graduate Scholarship-Doctoral (2005-2008)
		UBC PhD Tuition Award (2004-2008)
		MSFHR Graduate Studentship (2004-2006)
Claire Hou	M Marra	UBC Graduate Fellowship (2004-2005)
Anca Petrescu	M Marra	CIHR Grad Scholarship-Doctoral (2006-2010)
		MSFHR Jnr Grad Studentship (2005-2007)
		CIHR Grad Scholarship-Master's (2005-2006)
Trevor Pugh	M Marra	CIHR PhD Tuition Award (2006-2009)
		UBC Grad Fellowship (2006-2007)
		Eli Lilly Lung Cancer Research Fellowship (2005-2006)
Gang Wang	M Sadar	UBC Graduate Fellowship Award (2006)
Barbara Comuzzi	M Sadar	SBUR Travel Award (2006)
Angela Beckett	M Sadar	UBC Graduate Entrance Scholarship (2005-2006)
		ASCB Travel Award (2005)
Steven Quayle	M Sadar	MSFHR Trainee Award (2002-2005)
		CIHR Doctoral Research Award (2002-2005)
Terence Yung	M Sadar	BCCA Undergraduate Studentship (2006)

Current Awards and Honours

<i>Name</i>	<i>Distinguished Award/Honour</i>
Robert Holt	Best Foundational Advance Award, Synthetic Biology 2.0 Conference, BioBricks Foundation (2006)
Steven Jones	Senior Early Career Scholar, Peter Wall Inst. for Advanced Studies (2006)
	Spencer Award for IT Innovation, UBC (2006)
	President's 40 th Anniversary Award, SFU (2006)
	Canada's Top 40 Under 40 Award, Caldwell Partners International (2006)
	Top 40 Under 40 Award, Business in Vancouver (2006)
Marco Marra	Faculty Merit Award, Dept of Medical Genetics, UBC (2005)
	Career Investigator Senior Scholar Award, MSFHR (2006-2011)
	President's 40 th Anniversary Award, SFU (2006)
	Honorary Degree, Doctor of Laws, The University of Calgary (2005)
Isabella Tai	The Best of the Best of Canada's Top 40 Under 40, Caldwell Partners International (2005)
	Career Investigator Scholar Award, MSFHR (2005-2010)

Selected Current Contributions

<i>Name</i>	<i>Membership/Committee Involvement</i>
Angela Brooks-Wilson	Member, 2006 CIHR New Investigators Meeting Priority and Planning Committee
	Genome Sciences Centre Representative, Provincial Health Services Authority Laboratory Enterprise Program Council
	Member, CIHR Institute of Cancer Research Advisory Board
	Member, Genome British Columbia Genomics, Society & Ethics Advisory Committee
Robert Holt	Founding Member, University of British Columbia Institute of Mental Health
	Member, University of British Columbia and Vancouver Coastal Health Brain Research Centre
	CIHR Behavioral Sciences B Committee
	Member, International Anopheles Sequencing Committee
Steven Jones	Strategic Committee Member, BC Bioinformatics Network (BCBIN)
	Member, BC Proteomics Network Research Committee, Genome BC
	Member, Genome Atlantic Scientific Advisory Board for Sequencing Platform
	Member, Scientific Organizing Committee, The RegCreative Jamboree
	Member, Review Panel, Research Initiatives Program, Alberta Cancer Board
Marco Marra	Member, UBC Bioinformatics Centre (UBiC) Steering Committee
	Member, External Advisory Committee, NIH National Stem Cell Bank (NSCB)
	Chair NHGRI Review Panel for BAC Library Production RFA
	Member, Genome British Columbia Education Advisory Committee
	Member, National Human Genome Research Institute, Genome Research Review Committee
Marianne Sadar	Member, Biomedical Research Trainee Evaluation Committee (Junior Studentship Sub-Committee), MSFHR
	Member, Cellular and Tissue Biology Special Emphasis Review Panel, NIH/NCI
	Member, Drug Discovery & Molecular Pharmacology Study Section, NIH
	Committee Member, Panel D, Cell Cycle, Hormone/Steroid Receptors & Signal Transduction, NCIC
Marianne Sadar	Member, Program Grant Cluster Review Panel, Cell and Tissue Biol., NIH/NCI

	Committee Member (Pathobiology-1), US Army Medical Research and Material Command Prostate Cancer Research Program
Isabella Tai	Member, Research Initiatives Program Review Panel, Alberta Cancer Board
	Member, MD/PhD Advisory Committee, UBC
	Member, Research Strategic Committee, Faculty of Medicine, UBC

Current Research Projects²

1. A concerted genomic and proteomic approach to understand the development and carcinogenesis of the prostate	
<i>PI: J Vielkind</i> <i>Co-I: W Lam, P Hoodless, M Sadar</i> <i>Health Canada</i> <i>\$100,000/year (05 & 06)</i> <i>\$500,000 (2001 – 2006)</i>	The goal is to develop a delivery system to test the efficacy of therapeutic decoy molecules to prevent/delay the progression of prostate cancer to androgen independence.
2. A novel genomic approach to studying DNA copy number variation in schizophrenia and bipolar disorder	
<i>Co-PI: R Holt, W Honer</i> <i>CIHR</i> <i>\$49,947/year (05 & 06)</i> <i>\$99,894 (2004-2006)</i>	The objective of this study is to investigate abnormalities in DNA copy number in schizophrenia and bipolar disorder using array comparative genome hybridization.
3. Bioinformatics of mammalian gene expression	
<i>PI: S Jones</i> <i>Co-I: M Marra</i> <i>Genome Canada</i> <i>\$2,236,611/yr (05 & 06)</i> <i>\$6,709,834 (2002-2006)</i>	The objective is to discover, by bioinformatics techniques, regulatory elements in mammalian genes.
4. Bioinformatics training for health research	
<i>PI: S Jones</i> <i>Co-I: D Baillie, P Hieter, M Marra, F Brinkman, J Bryan, A Condon, A Gupta, F Ouellette, F Pio</i> <i>CIHR</i> <i>\$310,500/year (05 & 06)</i> <i>\$1,841,125 (2002-2008)</i> <i>MSFHR</i> <i>\$75,000/year (05 & 06)</i> <i>\$300,000 (2002-2007)</i>	The objective is to train bioinformatics' graduate students and post-doctoral fellows.
5. Biology of cancer: Follicular lymphoma as a model of cancer progression	
<i>PI: J Connors</i> <i>Co-I: M Marra, J Schein, R Holt, M Krzywinski, S Jones</i> <i>NCIC</i>	For project description see Pathology and Laboratory Medicine.

² Key to abbreviations: PI = Principal Investigator, Co-I = Co-investigator; CIHR* = Funding Institution; \$150,000 (2005-2007) = Total Project Funding for Given Years (*see pages 16-17 for a list of acronyms)

6. Bovine genome project: Full insert cDNA sequencing plan – Competition II award	
<p>PI: M Marra Co-I: R Holt, S Jones, S Moore (U of Alberta) Genome Canada \$5,128,062 to GSC \$2,198,574/year (05 & 06) \$6,595,723 (2004-2007)</p>	<p>The sequencing of the bovine genome will help lay the groundwork for breakthroughs that will benefit both human health and agriculture. The objective is to carry out full insert - cDNA sequencing as part of NIH/USDA Bovine Genome Sequencing Project.</p>
7. Canadian longitudinal study of aging: Developmental activities phase I	
<p>PI: S Kirkland, P Raina, C Wolfson, (Lady Davis Inst for Med Res, Montreal) Co-I: A Brooks-Wilson and 141 others CIHR \$770,000 (2005) \$1,744,000 (2004-2005)</p>	<p>The objective is to collect data on the process of aging, through longitudinal studies.</p>
8. Canadian molecular cytogenetics platform	
<p>PI: J Friedman (UBC) Co-I: M Marra, O Cohen, R Drouin, B Knoppers, P Lansdorp and 21 others CFI \$2,500,000 to GSC \$625,000/year (05 & 06) \$11,300,000 (2005 – 2009)</p>	<p>The purpose is to provide an infrastructure to support Canadian research to develop new molecular cytogenetic technologies, evaluate the clinical utility & cost-effectiveness of these technologies and assess their usefulness as research tools.</p>
9. Cancer Genomics – Genome Canada Competition I award	
<p>PI: M Marra, C Eaves, V Ling Co-I: S Jones, M Sadar, et al</p>	<p>For project description see Cancer Genetics.</p>
10. Comparative and functional genomics of the human pathogen <i>Cryptococcus neoformans</i> – Genome Canada Competition II award	
<p>PI: J Kronstad (UBC) Co-I: R Brunham, S Jones, M Marra, C. Nelson Genome Canada \$1,079,279 to GSC \$359,759 (2005) \$1,917,000 (2002-2005)</p>	<p>The objective is to perform whole genome shotgun sequencing and genome annotation of the fungal pathogen <i>Cryptococcus neoformans</i>.</p>
11. Cloning and characterization of <i>inx</i> and <i>echinus</i>, two genes involved in programmed cell death in <i>Drosophila</i>	
<p>PI: M Marra NSERC \$42,280/year (05 & 06) \$211,400 (2002-2007)</p>	<p>The objective is to clone and characterize two genes involved in programmed cell death in the fruit fly, <i>Drosophila melanogaster</i>.</p>
12. Creation of a publicly available SAGE dataset from NIH approved human ES cell lines	
<p>PI: C Eaves, M Marra NIH/NCI US\$110,000 (2005) US\$330,000 (2003-2005)</p>	<p>The objective is to construct and analyze 11 SAGE libraries from NIH approved human embryonic stem cell lines, and to make the SAGE dataset publicly available via the internet.</p>

13. Delineation of the mechanisms involved in ligand-independent activation of the androgen receptor	
<i>PI: M Sadar</i> <i>CIHR</i> \$109,513 (2006) \$547,565 (2006 – 2011)	The objective is to develop therapies for prostate cancer that will reverse or prevent the molecular consequences of anomalous transcriptional events associated with tumor progression and the emergence of androgen independence.
14. Development of a mass spectrometry-based method of full-length sequencing of proteins	
<i>PI: J Kast</i> <i>Co-I: S Jones</i> <i>CIHR</i> \$18,000 to GSC \$94,462/year (05 & 06) \$283,386 (2003-2006)	The goal is to develop a novel method to determine the individual state of each protein in high throughput, combining the expertise of two groups working on the analysis of the genome and the proteome.
15. Development of a novel cancer chemosensitizer	
<i>PI: I Tai</i> <i>CIHR</i> \$150,000 (2005 – 2006)	The goal is to optimize the peptide fragment of SPARC- <i>in vivo</i> and conduct preliminary stability and pharmacokinetic analysis to support further preclinical research.
16. Development of a potential new therapy for androgen independent prostate cancer	
<i>PI: M Sadar</i> <i>Health Canada</i> \$100,000/year (05 & 06) \$500,000 (2001-2006)	The aim is to determine if the expression of a specific modified protein (ARn) within prostate cancer cells is able to inhibit tumour growth and prevent the progression of the tumour to androgen (testosterone) independence.
17. Development of a potential new therapy for prostate cancer based upon the androgen receptor	
<i>PI: M Sadar</i> <i>US DOD</i> \$166,050/year (05 & 06) \$498,150 (2004 – 2007)	The aim is to determine if the expression of a specific modified protein (ARn) within the prostate cancer cells is able to inhibit tumour growth and prevent the progression of the tumour to androgen (testosterone) independence.
18. Development of custom array for the prognosis of prostate cancer	
<i>PI: M Sadar</i> <i>Co-I: S Abraham</i> <i>CIHR POP</i> \$150,000 (2005 – 2006)	The objective is to evaluate a potential prognosis tool/array capable of distinguishing aggressive disease from latent that will not cause symptoms using prostate cancer tissues with known clinical outcome.
19. Development of technologies for the derivation, propagation and differentiation of human embryonic stem cells (HESC)	
<i>PI: J Piret, M Bhatia, C Eaves, A Nagy</i> <i>Co-I: M Marra et al</i>	For project description see Terry Fox Laboratory.
20. Discovery of new drug candidates for the prevention of hormone refractory prostate cancer	
<i>PI: M Sadar</i> <i>Co-I: R Andersen</i> <i>US DOD</i> \$159,330/year (05 & 06) \$477,900 (2005 – 2008)	The objective is to discover new drug candidates for the prevention of hormone refractory prostate cancer.

21. Dissecting chemotherapy resistance in colorectal cancer using a genome-wide approach	
<p>PI: I Tai Canadian Society for Intestinal Research \$35,000/yr (05 & 06) \$105,000 (2003-2005)</p>	<p>The objective is to identify genetic markers of chemotherapy resistance from colorectal cancer.</p>
22. Dissecting gene expression networks in mammalian organogenesis – Genome Canada Competition III	
<p>PI: M Marra <i>et al</i> Co-PI: S Jones <i>et al</i> Genome Canada</p>	<p>For project description see Terry Fox Laboratory.</p>
23. Double stranded break surveillance genes and susceptibility to non-Hodgkin lymphoma	
<p>PI: A Brooks-Wilson Co-I: J Connors, R Gascoyne, J Spinelli NCIC \$149,531/year (05 & 06) \$444,593 (2004-2007)</p>	<p>The goal is to perform haplotype-based association studies in a case/control collection of hundreds of blood DNA samples from NHL patients and hundreds from controls, to determine whether genetic variation in any of the six key DNA repair genes affects susceptibility to NHL. The identification of genetic factors that predispose to NHL will be useful in the development of panels of diagnostic tests to help identify individuals at-risk for this cancer.</p>
24. Efficient identification and cloning of single gene deletions in the nematode <i>Caenorhabditis elegans</i>	
<p>PI: D Moerman (UBC) Co-PI: S Flibotte, R Barstead Genome Canada \$3,917,405 (2006) \$11,752,217 (2006–2008)</p>	<p>This project will create mutant strains of the <i>C. elegans</i> nematode by deleting, or knocking out specific genes in its genome, providing a resource for the international research community, and continue to provide researchers around the world with deletion mutations in genes in the small soil nematode <i>Caenorhabditis elegans</i>.</p>
25. Expression profiles of cells and tissues in <i>C. elegans</i> – Genome Canada Competition II award	
<p>PI: D Baillie (SFU) Co-I: M Marra, D Moerman (UBC), S Jones, F Ouellette (UBC), C Wahlestedt, E Sonnhammer, R Olafson (UVic), A Vas Gomes, T Burglin Genome Canada \$750,000/year (05 & 06) \$3,000,000 (2002-2006) \$706,426 to GSC</p>	<p>The goal is to examine the <i>C. elegans</i>, a soil nematode, after identifying genes that are similar in both humans and worms. By discovering the function of the genes in worms and their expression, the study hopes to understand the equivalent gene functions in humans. This work will in turn help understand not only genetic defects involving the malfunction of a single gene, but also the way in which genes and their products interact with developing cells, tissues and organs.</p>
26. Genes with major effects on life span in <i>C. elegans</i>	
<p>PI: D Riddle (UBC) Co-I: M Marra MNIH/ NIA \$106,500/year (05 & 06) \$532,500 (2000-2007)</p>	<p>The objective is to construct, sequence and analyze SAGE libraries from long-lived <i>C. elegans</i> mutants.</p>

27. Genetic variation in isoniazid metabolism genes: Effect on and use for prediction of Hepatotoxicity	
<p>PI: A Brooks-Wilson, F Marra Co-I: V Cook, K Elwood, M Fitzgerald BC Canadian Lung Assoc. \$22,500/year (05& 06) \$45,000 (2004-2006)</p>	<p>The objective is to determine response rate of isoniazid-treated patients and controls, to determine the spectrum of genetic variation in CES1 and CES2 patients with severe hepatotoxicity and estimate allele frequencies for genetic variants in NAT2, CES1 and CES2 in TB-relevant population groups in Vancouver.</p>
28. Genome British Columbia bioinformatics platform – Genome Canada Competition I & II awards	
<p>PI: S Jones Genome Canada \$2,198,764 (2005) \$8,795,055 (2001-2005)</p>	<p>The objective is to provide bioinformatics related to high-throughput DNA sequencing and DNA mapping including technical advice, support and capacity.</p>
29. Genome British Columbia Bioinformatics platform (Applied Genomics & Proteomics)	
<p>PI: S Jones Genome Canada \$122,455/year (05 & 06) \$367,367 (2005 – 2008)</p>	<p>The objective is to provide bioinformatics related to high-throughput DNA sequencing and mapping Genome BC Applied Genomics & Proteomics projects including technical advice, support and capacity.</p>
30. Genome British Columbia Large-scale High-throughput Genomics Platforms at BCCA-GSC – Genome Canada Competition III	
<p>PI: M Marra, S Jones, R Holt Co-I: A Siddiqui, A Baross, M Hirst, I Birol et al. Genome Canada \$8,841,687 to GSC \$2,947,299/year (2006) \$12,643,482 (2006–2008)</p>	<p>This project ensures the comprehensive infrastructure is preserved for the benefit of current Genome Canada-funded projects, as well as other funded Canadian research projects through the establishment of excess platform capacity.</p>
31. Genome British Columbia Sequencing and Mapping Platform (Applied Genomics & Proteomics)	
<p>PI: M Marra Genome Canada \$495,410/year (05 & 06) \$1,486,231 (2005 – 2008)</p>	<p>The objective is to provide bioinformatics related to high-throughput DNA sequencing and mapping Genome BC Applied Genomics & Proteomics projects including technical advice, support and capacity.</p>
32. Genome British Columbia Sequencing and Mapping platform – Genome Canada Competition I and II, & other	
<p>PI: M Marra Genome Canada \$6,065,119/year (05 & 06) \$24,260,478 (2001-2007)</p>	<p>The objective is to provide high-throughput DNA sequencing and DNA mapping including technical advice, support and capacity.</p>
33. Genome wide analysis reveals a novel gene involved in chemotherapy resistance in colorectal cancers	
<p>PI: I Tai CDHF/ CAG \$60,000/year (05 & 06) \$120,000 (2004-2006)</p>	<p>The goal of this project is to examine the role of a novel gene with a potential to contribute to chemotherapy resistance.</p>

34. Genomic and proteomic analysis of androgen independent prostate cancer	
<p>PI: M Sadar Co-I: M Marra, S Jones, YZ Wang, R Holt NIH \$275,598/year (05 & 06) \$1,377,990 (2004-2009)</p>	<p>The goal is to develop an in vivo model using hollow fibers to retrieve uncontaminated packages of prostate cancer cells (tumours) that can be used for subsequent molecular biology analyses of the progression of prostate cancer to androgen independence.</p>
35. Genomic tools for diagnosis and evaluation of mental retardation	
<p>PI: J Friedman, M Marra Co-I: R Holt, J Schein, S Jones et al. Genome Canada \$1,882,813 to GSC \$627,604/year (05 & 06) \$5,558,297 (2004-2007)</p>	<p>The goal is to develop an alternative to karyotyping to identify chromosomal abnormalities in people with mental retardation. The project will evaluate a new testing method to identify chromosome abnormalities 100 times smaller than those detectable by karyotyping.</p>
36. Genomics approach to the identification of the genetic and environmental components underlying berry quality in grapevine: GRAPEgen	
<p>PI: S Lund (UBC), JM Martinez-Zapater (INIA, Madrid, Spain) Co-I: M Marra, S Jones, R Olafson, P Bowen, J Bohlmann Genome Spain/Genome Canada \$890,195 to GSC \$1,044,827/year (05 & 06) \$3,134,481 (2004-2007)</p>	<p>The aims of this study is to understand how genes control berry ripening in different growing environments and to develop new varieties through breeding programs that exploit the natural variation inherent in Vitis.</p>
37. Genomics, Genetics & Gerontology (G3): A multidisciplinary team for the study of healthy aging	
<p>PI: M Marra, A Brooks-Wilson Co-I: S Jones, N Le, J Connors, G Meneilly CIHR \$231,969/year (05 & 06) \$1,159,844 (2003-2008)</p>	<p>The goal is to study genetic factors that underlie healthy aging and resistance to common age-related diseases such as cancer, cardiovascular disease and pulmonary disease. Genetic variants found to be associated with healthy aging, or associated with the protection against specific common age-related diseases will be useful as prognostics in the tailoring of individual disease prevention programs.</p>
38. High resolution analysis of follicular lymphoma genomes	
<p>PI: M Marra, J Connors, R Gascoyne Co-PI: D Horsman, M Krzywinski, J Schein, R Holt, S Jones, C Marra Genome Canada \$1,986,288 (2006) \$5,958,866 (2006 – 2008)</p>	<p>The major goal of this project is to discover the genomic rearrangements contributing to the development of follicular lymphoma and additional rearrangements contributing to the progression from follicular lymphoma to diffuse large B cell lymphoma.</p>

39. Identifying new genes causing spinocerebellar ataxias with an integrated clinical, molecular genetic and bioinformatics approach	
<p>PI: B. Leavitt Co-I: R Holt, F. Ouellette, B. Casey National Organization for Rare Disorders US\$39,991 (2004-2005) CAD\$7,164 to GSC</p>	<p>The long term goal is to improve the care for people with hereditary forms of spinocerebellar ataxias.</p>
40. Improvements in BAC fingerprinting and end sequencing	
<p>PI: M Marra Co-I: S Flibotte, D Fuhrmann, S Jones, M Krzywinski, A Marziali, J Schein NIH/NHGRI \$1,987,019/year (05 & 06) \$5,961,059 (2003-2006)</p>	<p>The objective is to undertake the development and implementation of both laboratory and bioinformatics' procedures to enhance the efficiency and reduce the costs of BAC fingerprint mapping and BAC end sequencing.</p>
41. Innovative approaches to cancer susceptibility	
<p>PI: A Brooks-Wilson CFI \$7,180/year (05 & 06) \$35,900 (2004 – 2009)</p>	<p>This project provide key operating infrastructure funding a CFI New Opportunities Equipment Fund award.</p>
42. Large scale genome sequencing/validation and improvement of whole genome assemblies	
<p>PI: R Wilson Co-I: S Jones NIH \$116,752 (05 & 06) \$350,256 (2003-2006)</p>	<p>The major goals of this project are for the GSC to verify the sequence of human and mouse and to validate and improve the whole genome assemblies.</p>
43. Mammalian gene collection	
<p>PI: M Marra NCI US\$1,857,478 (05 & 06) US\$5,572,434 (2004-2007)</p>	<p>The objective is to support efforts to acquire clones representing human and mouse genes missing from the Mammalian Gene Collection project.</p>
44. Mechanisms of Hox protein in mediated transformation	
<p>PI: J Hess Co-I: S Jones, G Robertson, A Shilatifard NIH \$20,340 (2006) \$101,700 (2006 – 2011)</p>	<p>The objective is to use bioinformatics tools to identify and characterize regulatory elements responsive to HOXA9 in hematopoietic cells.</p>
45. Molecular characterization of autophagic cell death	
<p>PI: S Gorski Co-I: G Morin CIHR \$98,543/year (05 & 06) \$517,715 (2005-2010)</p>	<p>The objective is to identify and characterize components involved in Type II programmed cell death.</p>

46. Molecular epidemiology of breast cancer	
<p>PI: K Aronson (Queens U) Co-I: P Ayotte, C Bajdik, A Brooks-Wilson, C Lohrisch, H Richardson, S Sengupta, J Spinelli CIHR \$248,997/year (05 & 06) \$1,244,988 (2004-2009)</p>	<p>The goal of this study is to determine if breast cancer risk is associated with PAH and light at night exposures, genetic factors, and the interaction between genetic and environmental factors, and to determine if breast cancer risk is different according to the type of breast cancer.</p>
47. Occupational risk identification for ovarian cancer	
<p>PI: N Le Co-I: C Bajdik, A Brooks-Wilson, J Spinelli, R Gallagher, P Demers WCB \$112,505 (2004-2005)</p>	<p>The purpose of this research is to identify potential carcinogens in the BC work environment for ovarian cancer.</p>
48. Optical systems for in vivo molecular imaging of cancer	
<p>PL: R Richards-Kortum, (Rice U) Co-I S Jones, M Marra, et al NIH</p>	<p>For project description see Cancer Imaging.</p>
49. Organochlorines (OC), ultraviolet radiation (UVR) and gene-environment (G/E) interactions in non-Hodgkin's lymphoma (NHL)	
<p>PI: J Spinelli Co-I: A Brooks-Wilson, N Le, J Connors, R Gallagher, JP Weber, R Gascoyne NCIC \$187,777/year (05 & 06) \$563,333 (2003-2006)</p>	<p>The major goals of this project are: to determine whether exposure to organochlorine compounds and the degree of ultraviolet radiation exposure, or a combination of genetic and environmental factors are related to the risk of NHL.</p>
50. Pleiades promoter project - Genome Canada Competition III	
<p>PI: E Simpson Co-I: D Goldowitz, S Jones, R Holt, and 3 others Genome Canada \$3,372,711 (2006) \$10,118,135 (2006-2008)</p>	<p>The project will use bioinformatics to characterize gene expressed in the mouse brain, and identify in which cells and regions they are expressed and which segments of DNA turn the genes on and off. The goal is to generate 160 fully characterized human DNA promoters which drive gene expression in defined brain regions.</p>
51. Prevalence of human papillomavirus in British Columbia	
<p>PI: A Brooks-Wilson, G Ogilvie Co-I: J Maticic, R Moore, J Lo, L St. Germain Merck Frosst Canada Ltd \$66,182/year (05 & 06) \$198,548 (2004-2006)</p>	<p>This study will determine the prevalence of individual types of Human Papillomavirus in British Columbia and will be useful for the optimization of vaccine programs in the province.</p>
52. Proteomics associated with the progression of prostate cancer to androgen independence	
<p>PI: M Sadar, J Vielkind Health Canada \$100,000/year (05 & 06) \$500,000 (2001-2006)</p>	<p>SELDI-TOF-MS and 2D PAGE analysis of the proteome of prostate cancer cells during progression to androgen independence.</p>

53. Quantitative and comprehensive atlas of gene expression in mouse development – Genome Canada Competition II award	
<p>PI: P Hoodless, M Marra Co-I: R Strausberg, E Simpson, G Riggins, S Jones, C. Helgason Genome Canada \$4,578,549 to GSC \$3,298,88/year (05 & 06) \$13,195,524 (2002-2006)</p>	<p>In an effort to thoroughly understand the genes that regulate mouse development, this project aims to develop an “atlas” of genes which are expressed at various stages of mouse development in different types of tissue. Since disease may result from a failure in the regulation of genes, an understanding of how gene expression is controlled in mice will provide an important insight into the disease process in humans.</p>
54. Role of autophagy in the therapeutic response of breast cancer cells	
<p>PI: S Gorski CBCF \$75,000/year \$150,000 (2006-2008)</p>	<p>The objective is to evaluate the potential of using autophagy inhibition to sensitize breast cancer cells to endocrine therapy and chemotherapy.</p>
55. SAGE sequencing of mouse genome to develop an atlas of gene expression	
<p>PI: M Marra NCI/SAIC \$433,333/year (05 & 06) \$1,300,000 (2003-2006)</p>	<p>The goal is to carry out SAGE gene expression profiling of tissues selected from time points throughout mouse development.</p>
56. Structure based drug discovery against novel binding pockets of androgen receptors	
<p>PI: S Jones Co-I: M Sadar, J An PCRFC \$30,000 (2006) \$60,000 (2006 – 2008)</p>	<p>The goal is to discover novel anti-prostate cancer drugs in a rapid and efficient manner.</p>
57. Sun exposure, vitamin D and prostate cancer	
<p>PI: R. Gallagher Co-I: A. Brooks-Wilson, J Spinelli, M Borugian, M Pollack, G. Chambers CIHR \$163,636/year (05 & 06) \$490,908 (2003-2008)</p>	<p>For project description see Cancer Control Research This project will determine whether there is an inverse relationship between ultraviolet radiation exposure and risk of prostate cancer and whether there is evidence of a dose-response relationship between exposure and risk.</p>
58. The role of autophagy in breast cancer	
<p>PI: S Gorski Co-I: D Huntsman, M Bally, D Waterhouse DOD US\$80,918 (2005-2006)</p>	<p>The objective is to assess the impact of autophagy in breast cancer tumorigenesis and treatment, and have the potential to create a new avenue of research in the field of breast cancer.</p>
59. Understanding the contribution of chemotherapy resistant cancer cells and the tumor microenvironment in gastrointestinal tumor metastasis	
<p>PI: I Tai Co-I: G Morin Collaborators: M Marra, C Scudamore, H Sage CRS \$150,000/year (05 & 06) \$450,000 (2005 – 2008)</p>	<p>The objective is to determine if the metastatic potential of cancer cells changes with tumor stage, degree of differentiation, sensitivity to chemotherapy and route of spread using a mouse model of circulating tumor cells.</p>

