

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed for Form Page 2.  
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Geoff Hicks		POSITION TITLE Professor, University of Manitoba	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Manitoba	BSc	1985	Biochemistry
University of Manitoba	PhD	1991	Cancer Biology
Massachusetts Institute of Technology	Post-Doc	1992	Cancer Biology
Vanderbilt University School of Medicine	Post-Doc	1996	Cancer Genetics

**A. Personal Statement**

For the past 15 years the major focus of my lab has been the development and application of high-throughput gene-trap and gene-targeting mutagenesis in mouse embryonic stem cells. I have been the Principal Investigator for several large-scale genomics grants awarded by the Canadian Institutes of Health Research (CIHR) and Genome Canada, and the recipient of a Canada Research Chair in Functional Genomics. Most notably, my team and I developed the Mammalian Functional Genomics Centre, which is currently internationally recognized as a centre of excellence in the genetic engineering of embryonic stem cells and contributed significantly to the International Mouse Mutagenesis Consortium – a large scale international gene targeting program to create a publicly available resource of conditional-ready knockout mice for each of the 20,000 coding genes. More recently my group has developed new technologies to genetically engineer more direct models of human disease, including a flagship model of FASD, which is highlighted in this proposal. I am a founding member of the Canada-Israel International FASD Consortium and a new PI in both the NeuroDevNet Network of Centres of Excellence and a CIHR New Team in the epigenetics of FASD. In 2009 I became the Director of the Regenerative Medicine Program at the University of Manitoba.

**B. Positions and Honors.****Positions and Employment**

1997-1998	Instructor of Microbiology and Immunology (Faculty). Vanderbilt University, Nashville, TN.
1998-2001	Assistant Professor, Faculty of Medicine, Physiology, University of Manitoba.
1999-2001	Assistant Professor, Faculty of Medicine, Biochemistry & Medical Genetics, UM.
1998-present	Senior Investigator, Manitoba Institute of Cell Biology, CancerCare Manitoba.
1999-present	Director, Mammalian Functional Genomics Centre.
2002-2012	Associate Professor, Faculty of Medicine, Physiology, University of Manitoba.
2002-2012	Associate Professor, Faculty of Medicine, Biochemistry & Medical Genetics, UM.
2005	Tenure, University of Manitoba.
2007-present	Director, Genetic Modeling Centre, UM.
2008-present	Director, Regenerative Medicine program, UM.
2012-present	Professor, Faculty of Medicine, Biochemistry & Medical Genetics, UM.

**Current Activities and Contributions***Networks:*

- Canadian Genetic Disease Network Centre of Excellence Investigator.
- Stem Cell Network Centre of Excellence Associate Investigator.
- US DOE Transcribed Genome Program.
- NIH Ewing Sarcoma Initiative.
- International Gene Trap Consortium, founding member.
- International Mouse Mutagenesis Consortium, founding member.
- International Knockout Mouse Project Consortium, founding member.
- Federation of International Mutant Mouse Resources, founding member.
- Canadian Mouse Consortium, founding member.

- International Knockout Mouse Consortium, founding member.
- UM Research Groups; Molecular Oncology, Gene Technology, and Human Genetic Diseases.
- Canadian NeuroDevNet Network Centre of Excellence Investigator

*Professional Activities:*

- National Cancer Institute of Canada, Review Panel D Chair.
- Canadian Institutes of Health Research, Genomics Panel.
- Canadian Institutes of Health Research, Reviewer for G, CPT and MCC Panels.
- Chair, CIHR Institute of Genetics New Principal Investigator Symposium.
- CIHR Institute of Genetics Advisory Panel – Scientific Director, Gene Cure Foundation.
- Associate Dean Research (Medicine) Advisory Committee.
- Manitoba Health Research Council, Research Advisory Committee.
- UM Animal Care Protocol Review Committee.
- Stem Cell Network Research Management Committee.
- Terry Fox Research Institute – New Frontiers Program.
- Canada-Israel FASD Consortium, founding member and investigator.
- Research and Management Committee – Stem Cell Network of Canada.
- CIHR Institute of Genetics – Chair, Institute Advisory Board.
- Reviewer, Gairdner International Awards.

**Honors and Awards**

1989-1991	University of Manitoba Graduate Fellowship.
1991	Faculty of Medicine Major Award for Doctoral Research, Molecular Biology.
1991-1994	National Cancer Institute of Canada Fellowship.
1999	MHRC Establishment Award.
1999	Canada Foundation for Innovation New Investigator.
2001-2006	Canada Research Chair in Cell Biology and Functional Genomics.
2006-2011	Canada Research Chair in Cell Biology and Functional Genomics.
2010	Outstanding Leadership in Research - Life Sciences Association of Manitoba

**C. Selected peer-reviewed publications.**

1. Skarnes, WC, von Melchner, H, Wurst, W, **Hicks, GG**, Nord, AS, Cox, T, Young, SG, Ruiz, P, Soriano, P, Tessier-Lavigne, M, Conklin, B, Stanford, WL and Rossant, J. (2004). International Resource for Targeted Mutations in Embryonic Stem Cells. *Nature Genetics*, **36**: 543-544.
2. Austin, CP, et al. (2004). The Knockout Mouse Project: A comprehensive plan for placing knockouts of all mouse genes and associated Phenotype data into the public domain. *Nature Genetics*, **36**: 921-924.
3. Schofield, PN, Bubela, T, Weaver, T, Portilla, L, Brown, SD, Hancock, JM, Einhorn, D, Tocchini-Valentini, G, Hrabe de Angelis, M, Rosenthal, N, Barnes, J, Collis, AJ, Desaintes, C, Dixon, JE, Doyle, A, Eppig, J, Field, D, Grunberger, M, Heim, S, **Hicks, G**, Hubbard, T, Jennings, R, Kennedy, K, Kennedy, G, Kolar, P, Livingstone, A, Lloyd, K, Masuya, H, Matteoni, R, Maurer, J, McKenzie, A, McKerlie, C, Moore, M, Muddyman, D, Nguyen, T, Parsons, M, Quackenbush, J, Reuveni, E, Salimova, E, Siegal, V, Skingle, M, Smedley, D, Sugden, A, Wakana and S, Walsh, JP. (2009). Post-publication sharing of data and tools. *Nature*, **461**:171-173.
4. Xu, K., Nieuwenhuis, E., Cohen, B., Wang, W., Canty, A., Danska, J., Coultas, L., Rossant, J., Wu, M., Piscione, T., Gossler, A., Hicks, GG., Hui, C.-c., Henkelman, RM., Yu, L., Sled, L., Gridley, T. and Egan, S. (2010). Lunatic Fringe-mediated Notch signaling is required for lung alveogenesis. *Am J Physiol Lung Cell Mol Physiol*. **298**:45-56.
5. Sabbir, MG., Wigle, N., Loewen, S., Gu, Y., Buse, C., **Hicks, GG.** and Mowat, MRA (2010). Identification and characterization of Dlc1 isoforms in the mouse and study of the biological function of a single gene trapped isoform. *BMC Biology*, **8**:17-26.
6. Ringwald M, Iyer V, Mason JC, Stone KR, Tadepally HD, Kadin JA, Bult CJ, Eppig JT, Oakley DJ, Briois S, Stupka E, Maselli V, Smedley D, Liu S, Hansen J, Baldock R, **Hicks GG** and Skarnes WC. (2011). The IKMC web portal: a central point of entry to data and resources from the International Knockout Mouse Consortium. *Nucleic Acids Res*. **39**:D849-55.
7. Choi, Y., Lin, Y-P, Ho, JJ., He, X., Okada, N., Bu, P., Zhong, Y., Kim, SY., Bennett, M., Chen, C., **Ozturk, A., Hicks, GG.**, Hannon, GJ. and He, L. (2011). miR-34a miRNA provides a barrier for somatic cell reprogramming. *Nat Cell Biol.*, **13**:1353-60.

8. Beaulieu, CL, Samuels, M, Ekins, S, McMaster, CR, Edwards, AM, Kraimer, AR, **Hicks, GG**, Frey, BJ, Boycott, KM and MacKenzie, A. (2012). A generalizable pre-clinical research pathway for orphan disease therapy. *Orphanet Journal of Rare Diseases*, **7**:39
9. Bradley A, et al. (2012) The mammalian gene function resource: the International Knockout Mouse Consortium. *Mamm Genome* **23**:580-6.
10. Lin C-P., Choi, YL., Hicks, GG. and He L. (2012). The emerging functions of the p53-miRNA network in stem cell biology. *Cell Cycle* **11**:2063-72
11. Lagier-Tourenne, C., Polymenidou, M., Hutt, KR., Vu, AQ., Baughn, M., Huelga, SC., Clutario, KM., Ling, S-C., Liang, TY., Mazur, C., Wancewicz, E., Kim, AS., Watt, A., Freier, S., **Hicks, GG.**, Donohue, JP., Shiue, L., Bennett, CF., Ravits, J., Cleveland, DW. & Yeo, GW. (2012). Divergent roles of ALS-linked proteins FUS/TLS and TDP-43 intersect in processing long pre-mRNAs. *Nature Neuroscience* **15**:1488–1497
12. Zhou Y, Liu S, Liu G, Ozturk A, **Hicks GG**. ALS-Associated *FUS* Mutations Result In Compromised *FUS* Alternative Splicing And Autoregulation. *PLoS Genetics* 2013. Oct;9:e1003895. doi: 10.1371.
13. Zhou Y, Liu S, Liu G, Ozturk A, **Hicks GG**. (2014). Dysregulated RNA Metabolism and DNA Damage Repair underlie FUS-associated Amyotrophic Lateral Sclerosis. *Rare Diseases* **2**: 29515. doi: 10.4161.

### C. Selected Invited Presentations, Seminars and Meetings.

“Genetically engineering mouse models to assess new prevention strategies for Fetal Alcohol Syndrome.” Limmud Winnipeg 2012, Winnipeg, February 2012.

“Molecular analysis of the ethanol effect in Fetal Alcohol Syndrome suggests a preventive approach.” Genetics and Epigenetics of FASD, St Pierre, Reunion Island, France, March 2012.

“New insights into Fetal Alcohol Spectrum Disorder preventive.” Reunion Island Prefecture, St. Denis, France, March 2012.

“Engineering Discovery and Pre-Clinical Models for Childhood Cancers.” Western Canada Children’s Cancer Research Network Symposium, Edmonton, May 2012.

“Engineering Discovery and Pre-Clinical Models for Childhood Cancers.” Western Canada Children’s Cancer Research Network Symposium, Edmonton, May 2012.

“GSC::Cyp26A – a mouse model of FASD.” NeuroDevNet NCE AGM, Toronto, Sept. 2012.

“Genetically Engineered mouse models for Discovery and Pre-Clinical Validation.” Institute of Basic Medical Sciences, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing, Nov. 2012.

“Genetically Modeling Rare Human Diseases in Mouse Models.” Hefei University, Hefei, Nov. 2012.

“microRNA and mRNA Expression Profiles Identify Regulatory Networks Coordinated by FUS/TLS.” (Abstract, [Zhou Y](#), Ozturk A, Liu S, Hicks GG). Keystone Symposia: Noncoding RNA in Development and Cancer, Vancouver, Jan 20- 25, 2013.

“Canada-Israel International Fetal Alcohol Consortium.” International FASD Collaborations Symposium (Symposium Organizer and Co-chair), Winnipeg, Feb 2013.

“Developing Pre-Clinical Mouse Models for FASD and Human Disease.” 5<sup>th</sup> International Conference on FASD, Vancouver, Feb. 2013.

Fetal Alcohol Spectrum Disorder; Alcohol Competes With Vitamin A Metabolism During Early Embryogenesis.” 5<sup>th</sup> International Conference on FASD, Vancouver, Feb. 2013.

“Familial ALS with FUS mutations.” 2014 Western Medical Diagnostic Laboratories Conference, Winnipeg, May 1<sup>st</sup>, 2014.

“ALS-FUS mutants are compromised in alternative splicing and autoregulation.” 10th Annual ALS CANADA Research Forum. Toronto, May 3 – 5, 2014.

“Genetics of FASD.” 2nd Canada Israel International Fetal Alcohol Consortium Symposium. (Symposium Co-Organizer and Chair). Jerusalem, Israel, June 5, 2014.

“Genetic Modeling FASD in Mice.” Research Society on Alcoholism and the International Society for Biomedical Research on Alcoholism 2014 Joint Congress. MOLECULAR ETIOLOGY OF FASD: NEW

INSIGHTS FROM ANIMAL MODELS (Mini-Symposium Co-Organizer and Co-Chair), Bellevue, WA, June 21-25, 2014.

## **D. Research Support.**

### **Active Grants**

Title of Grant: Discovering the Epigenetic Signatures Associated with Fetal Alcohol Spectrum Disorder.

Source: Canadian Institutes of Health Research – New Teams in Epigenetics.

Dollars Awarded: \$70,000 per annum to Hicks (Project total: \$1.34M)

Date: April 1, 2013 through Mar 31, 2018

Name of P.I.: Jim Davie

Co-applicant: Marc Del Bigio, Ab Chudley, Brenda Elias, Abraham Fainsod, Geoff Hicks, and Mojgan Rastegar.

Title of Grant: Global Leadership in Reducing the Impacts of FASD.

Source: MLLC

Dollars Awarded: \$250,000 per annum to Hicks (Project total: \$1.5M)

Date: Nov 1, 2013 through Oct 31, 2016

Name of P.I.: Geoff Hicks

Co-applicant: Ab Chudley, Abraham Fainsod, Brenda Elias, Miyoung Suh.

Title of Grant: A Novel ATM-FUS-miRNA Pathway Coordinates DNA Damage Response and is Disrupted in FUS-Associated Cancer.

Source: CancerCare Manitoba Foundation, Operating.

Dollars Awarded: \$120,000

Date: July 1, 2014 through June 30, 2016

Name of P.I.: Geoff Hicks

Title of Grant: A genetic mouse model for the induction of FASD through reduced retinoic acid signaling.

Source: Canada Israel FASD Consortium, Operating.

Dollars Awarded: \$135,000.

Date: Sept 1, 2011 through Dec 31, 2015

Name of P.I.: Geoff Hicks. Co-applicant: Abraham Fainsod

Goal: to develop and assess a novel model that recapitulates the repression of RALDH2 by ethanol, and that can be rescued by Vitamin A treatment.

Title of Grant: *NorCOMM2*: Functional genomics tools to drive stem cell & regenerative medicine research.

Source: Global Leadership Round in Genomics & Life Sciences. Manitoba Research Innovation Fund and the Ontario Research Fund.

Dollars Awarded: \$240,000 per annum to Hicks (Project total: \$6.8M).

Date: Oct 1, 2010 through Mar 31, 2015

Name of P.I.: Geoff Hicks. Co-applicant: Colin McKerlie, Andras Nagy and Janet Rossant

Goal: to develop conditional-drivers for the Knockout Mouse Resource prioritizing the needs of stem cell programs; to develop new genetic engineering tools for pre-clinical models of human disease; and where possible, complete the knockout mouse resource.

### **Completed Grants**

Title of Grant: Genetics and Epigenetics of FASD.

Source: Canada Israel FASD Consortium, Operating.

Dollars Awarded: \$55,000.

Date: Sept 1, 2011 through August 31, 2014

Name of P.I.: Geoff Hicks. Co-applicant: Ab Chudley, Songyan Liu, Abraham Fainsod