
BIOGRAPHICAL SKETCH**Senior Trainer.**

NAME: Hasan Khatib

eRA COMMONS USER NAME: HKHATIB

POSITION TITLE: Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
The Hebrew University of Jerusalem, Israel	B.S.	1982- 1985	Biology
The Hebrew University of Jerusalem, Israel	M.S.	1987- 1988	Human Genetics
The Hebrew University of Jerusalem, Israel	Ph.D.	1989- 1994	Genetics
The Hebrew University of Jerusalem, Israel	Post doc	1995- 1998	Genetics

A. Personal Statement

Infertility has become a challenge in many mammalian species. In humans, about 15% of couples fail to conceive within the course of a year of unprotected sex. Within the United States, 11.0 % of women ages 15-44 have impaired fecundity and about 6% are infertile. Assisted reproductive technologies have become well developed and utilized to overcome some of the challenges of infertility. However, assessment of embryo quality and potential of in vivo and in-vitro produced embryos is largely based on morphology which is often not indicative of the embryo's ability to establish a pregnancy. Thus, the objectives of my research are to identify and characterize genes and epigenetic markers as predictors of embryo development using non-invasive methods. We are investigating the roles of imprinted genes and epigenetic modifications in early embryonic development. Another focus of my research is the study of the effects of maternal nutrition on the transcriptome and epigenome of the offspring. Methods used in our lab include genome-wide association studies, RNA-Seq, DNA methylation, CRISPR, microRNAs, and RNAi.

B. Positions and Honors

2009- date: member of The Endocrinology-Reproductive Physiology Program, UW-Madison

2013- : Department of Animal Sciences, University of Wisconsin. Full Professor

2011- 2013: Department of Animal Sciences, University of Wisconsin. Associate Professor

2002- 2008: Department of Dairy Science, University of Wisconsin. Assistant Professor

2001-2002: The Hebrew University of Jerusalem. Researcher at Department of Genetics

1998-2001: Department of Genetics, The Hebrew University of Jerusalem. Post-doc

2000-2002: Institute of Genetic Identification, Jerusalem. Director

1997-2002: The David Yellin College of Education, Jerusalem, Israel. Lecturer.

1995-1997: Hadassah Medical Center, Jerusalem, Israel. Genetic counseling.

Professional activities (2011-2017)

- Organizer of the Animal Epigenetics workshop; Plant & Animal Genome Meeting, San Diego, CA (since 2008).
- Organizer of the Domestic Animal Epigenetics Workshop; International Society of Animal Genetics Meeting (since 2008).
- Member of the Breeding and Genetics Program Committee; JAM meeting 2015-2017.
- Co-Chair of the Breeding and Genetics Symposium: Joint Interbull/JAM Session; JAM meeting 2015, Orlando, Florida.

- Chair of the Breeding and Genetics Feed efficiency and methods session. July 16, 2015. JAM meeting, Orlando, Florida.
- Organizer and chair of the Morris Soller Symposium; January 17, 2011. San Diego CA.
- Co-chair of the Epigenomics Session; 4th International Symposium on Animal Functional Genomics, October 10-12, 2011. Dublin, Ireland.
- Scientific Committee member of the 4th International Symposium on Animal Functional Genomics, October 10-12, 2011. Dublin, Ireland.
- Co-organizer of the workshop “Effective teaching in a global college classroom” May 25, 2011. Teaching and Learning Symposium, University of Wisconsin-Madison

C. Contributions to Science

1) Studies in Embryo development:

- Kropp J, Carrillo JA, Namous H, Daniels A, Salih SM, Song J, and Khatib H (2017) Male fertility status is associated with DNA methylation signatures in sperm and transcriptomic profiles of bovine preimplantation embryos. *BMC Genomics* 18:280
- Kropp J and Khatib H (2015) mRNA Fragments in In-Vitro Culture Media are Associated with Bovine Preimplantation Embryonic Development. *Front. Genet.* 6:273.
- Peñagaricano F, Souza AH, Carvalho PD, Driver AM, Gambra R, Kropp J, Hackbart KS, Luchini D, Shaver RD, Wiltbank MC, and Khatib H (2013) Effect of Maternal Methionine Supplementation on the Transcriptome of Bovine Preimplantation Embryos. *PLoS One* 8(8):e72302
- Driver A, Huang W, Kropp J, Peñagaricano F, and Khatib H (2013) Knockdown of CDKN1C (p57kip2) and PHLDA2 results in abnormal development of bovine pre-implantation embryos. *PLoS One* 8(7): e69490.

2) Roles of miRNA

- Gross N, Kropp J, and Khatib H (2017) Sexual Dimorphism of miRNAs Secreted by Bovine In vitro-produced Embryos. *Front. Genet.* 8:39
- Kropp J and Khatib H (2015) Characterization of microRNA in bovine in vitro culture media associated with embryo quality and development. *J. Dairy Sci.* 98:6552-6563.
- Kropp J, Salih S, and Khatib H (2014). Expression of microRNAs in bovine and human pre-implantation embryo culture media. *Front. Genet.* 5:91.

3) Fertility Cryo Preservation

- Kropp J, Roti Roti EC, Ringelstetter A, Khatib H, Abbott DH, and Salih SM (2015) Dexrazoxane Diminishes Doxorubicin-induced Acute Ovarian Damage and Preserves Ovarian Function and Fecundity in Mice. *PLoS ONE* 10(11): e0142588

4) External Factors Influencing Body Composition:

- Cole JB, Bormann JM, Gill CA, Khatib H, Koltjes JE, Maltecca C, and Miglior F (2017) BREEDING AND GENETICS SYMPOSIUM: Resilience of livestock to changing environments. *Journal of Animal Science* 2017 0: 0: -doi:10.2527/jas.2017.1402
- Peñagaricano F, Valente BD, Steibel JP, Bates RO, Ernst CW, Khatib H, Rosa GJM (2015) Exploring causal networks underlying fat deposition and muscularity in pigs through the integration of phenotypic, genotypic and transcriptomic data. *BMC Syst Biol.* 16;9:58.
- Peñagaricano F, Valente BD, Steibel JP, Bates RO, Ernst CW, Khatib H, and Rosa GJM (2015) Searching for causal networks involving latent variables in complex traits: application to growth, carcass, and meat quality traits in pigs. *J. Animal Sci. J Anim Sci.* 93(10):4617-23.
- Andersson L, Archibald AL, Bottema CD, Brauning R, Burgess SC, Burt DW, Casas E, Cheng HH, Clarke L, Couldrey C, Dalrymple BP, Elsik CG, Foissac S, Giuffra E, Groenen MA, Hayes BJ, Huang LS, Khatib H, Kijas JW, Kim H, Lunney JK, McCarthy FM, McEwan JC, Moore S, Nanduri B, Notredame C, Palti Y, Plastow GS, Reecy JM, Rohrer GA, Sarropoulou E, Schmidt CJ, Silverstein J, Tellam RL, Tixier-Boichard M, Tosser-Klopp G, Tuggle CK, Vilkki J, White SN, Zhao S, Zhou H and The FAANG Consortium (2015) Coordinated international action to accelerate genome-to-phenome with FAANG, the Functional Annotation of Animal Genomes project. *Genome Biology* 16:57.

D. Additional Information: Research Support and/or Scholastic Performance

Agency	Title	Duration
CALS-Bridge Funding	Atlas of imprinting genes in cattle: A tool to elucidate the role of epigenetics in animal health and production	6/2015 - 6/2017
USDA HATCH-CALS PI-KHATIB	The Identification of Epigenomic and Transcriptomic Signatures Associated With Male Fertility and Embryo Development in Cattle	10/2014-09/2018
GENHOME/ITALY PI-KHATIB	Effects of maternal nutrition during pregnancy on offspring traits in sheep	08/2015-7/2017

Patents:

- 1. Dairy cattle breeding for improved milk production traits in cattle.
- US 20070015164 A1. Publication date: January 18, 2007
- 2. Detection of Lethality Gene for Improved Fertility in Mammals.
- US 20070234437 A1. Publication date: October 4, 2007
- 3. Dairy cattle breeding for improved milk production traits in cattle.
- US 20080307535 A1. Publication date: December 11, 2008
- 4. Methods and compositions for improved cattle longevity and milk production.
- WO 2009062042 A3. Publication date: August 27, 2009
- 5. Methods and Compositions for Testing and Breeding Cattle for Improved Fertility and Embryonic Survival .
- US 20100185047 A1. Publication date: July 22, 2010
- 6. Methods and compositions for genetically detecting improved milk production traits in cattle.
- US 7888021 B2; US-2008-0187921. Publication date: February 15, 2011
- 7. Methods and compositions for genetically detecting improved milk production traits in cattle.
- US 20110195868 A1. Publication date: November 8, 2011
- 8. Methods and compositions for improved fertilization and embryonic survival.
- US 8067171 B2; US-2009-0299130. Publication date: November 29, 2011
- 9. Genetic testing for improved cattle fertility.
- US 20130267770 A1. Publication date: October 10, 2013
- 10. Methods and compositions for improved fertilization and embryonic survival.
- US-2009-0253952; US 8569574 B2. Publication date: October 29, 2013
- 11. Association of the progesterone receptor with fertility.
- US 8647819 B2; US-2011-0118539. Publication date: February 11, 2014
- 12. Methods and compositions for improved fertilization and embryonic survival.
- US 20130041209 A1. Publication date: February 13, 2014
- 13. Dairy cattle breeding for improved milk production traits in cattle.
- US 20140142369 A1. Publication date: May 22, 2014
- 14. Methods and compositions for monitoring and enhancing early embryo development.
- US 20140200393 A1. Publication date: July 17, 2014
- 15. Methods and compositions for improved fertilization and embryonic survival.
- US 8790875 B2; US-2014-0330071. Publication date: July 29, 2014
- 16. NON-INVASIVE ASSAYS FOR EMBRYO QUALITY
- Provisional # P150131US01. Filed May 15, 2015