BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Barak Blum	Assistant Professor
eRA COMMONS USER NAME (credential, e.g., agency login)	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Ben-Gurion University of the Negev	B.Sc., ***cum laude***	1998-2001	Life Sciences
The Hebrew University of Jerusalem	M.Sc., ***cum laude***	2001-2004	Medical Biochemistry
The Hebrew University of Jerusalem	Ph.D.	2004-2009	Genetics
Harvard University and Harvard Stem Cell Institute	Post-doctoral training	2009-2015	Stem Cell and Regenerative Biology for Diabetes

A. Personal Statement

My research aims at understanding the molecular regulation of the functionally mature pancreatic β cell state during development, its loss as an early stage of β cell failure in diabetes, and its contribution to the initiation of autoimmunity in type-1 diabetes. These questions are both important from a basic developmental biology aspect and key in regenerative medicine approaches for diabetics. By merging my expertise in human pluripotent stem cells differentiation, developmental biology of the pancreas, mouse genetics and functional genomics, I aim to discover the genetic and molecular regulatory circuits controlling the development, maintenance, collapse and recovery of the fully differentiated, functionally mature β cell state in mice and humans. I believe that expanding our knowledge of functional β cell maturation will have an important impact on both stem cell based therapy for type-1 diabetes, the prevention of irreversible β cell de-differentiation and β cell failure in type-2 diabetes, as well as β cell destruction in type-1 diabetes.

B. Positions and Honors

Positions and Employment

2015-Present Assistant Professor, Dept. of Cell and Regenerative Biology, University of Wisconsin-Madison

2009-2015 Post-doctorate Fellow at the laboratory of Prof. Douglas A. Melton, Dept. of Stem Cell and Regenerative Biology and the Harvard Stem Cell Institute, Harvard University

2004-2009 Ph.D. candidate on “Cellular and molecular characterization of teratomas from human embryonic stem cells”. Under the supervision of Prof. Nissim Benvenisty, Dept. of Genetics, the Hebrew University of Jerusalem

2004-2009 Teaching assistant at the Life Sciences Institute, The Hebrew University of Jerusalem: General Genetics (Lab)

2001-2004 M.Sc. candidate on “The importance of PPARE response element for the PEPCK-C gene expression in liver and adipose tissue in vivo and the mechanism of glucocorticoids suppression of the gene transcription in adipose tissue”. Under the supervision of Prof. Lea Reshef, Dept. of Biochemistry, The Hebrew University, Hadassah Medical School, Jerusalem

Honors

2011-2014 JDRF Post-Doctoral Fellowship

2009-2011 EMBO Post-Doctoral Fellowship

2009 Menashe Marcus Prize for Excellent Graduate Student

2008 ISSCR Travel Award, for participation in the International Society for Stem Cell Research (ISSCR) 6th annual meeting, Philadelphia, USA

2008 Best Poster Presentation Award, The 2nd International Stem Cell Meeting of the Israel Stem Cell Society (ISCS), Tel-Aviv, Israel

2006 Russek Travel Award for excellent graduate students, for participation in the International Society for Stem Cell Research (ISSCR) 4th annual meeting, Toronto, Canada

2004 Faculty Prize for Best M.Sc. Thesis in Medical Sciences

2002 Scholarship from the Dr. Malka Wolf Foundation

2001 Dean's list for extreme excellence (summa cum laude)

2000 Awarded "Best Negev Industry Fellowship".

C. Peer-Reviewed Publications

1. Olswang, Y.*****, **Blum, B.***, Cassuto, H.*, Cohen, H., Biberman, Y., Hanson, R.W. and Reshef, L., Glucocorticoids repress transcription of the phosphoenolpyruvatecarboxykinase (GTP) gene in adipocytes by inhibiting its C/EBP-mediated activation. **J. Biol. Chem.**, 278:12929-12939, (2003)
   ***These authors contributed equally to this work**

2. Reshef, L., Olswang, Y., Cassuto, H., **Blum, B.**, Croniger, C.M., Kalhan, S.C., Tilghman, S.M. and Hanson, R.W., Glyceroneogenesis and the triglyceride/fatty acid cycle. **J. Biol. Chem.**, 278:30413-30416, (2003)

3. Cassuto, H., Kochan, K., Chakravarty, K., Cohen, H., **Blum, B.**, Olswang, Y., Hakimi, P., Xu, C., Massillon, D., Hanson, R.W. and Reshef, L., Glucocorticoids regulate transcription of the gene for phosphoenolpyruvate carboxykinase in the liver via an extended glucocorticoid regulatory unit. **J. Biol. Chem.**, 280:33873-33884, (2005)

5. Adewumi, O., Aflatoonian, B., Ahrlund-Richter, L., Amit, M., Andrews, P.W., Beighton, G., Bello, P.A., Benvenisty, N., Berry, L.S., Bevan, S., **Blum, B.**, et al. Characterization of human embryonic stem cell lines by the International Stem Cell Initiative. **Nat. Biotechnol.**, 25:803-816, (2007)

6. **Blum, B.**, and Benvenisty, N., Clonal analysis of human embryonic stem cell differentiation into teratomas. **Stem Cells**, 25:1924-1930, (2007)

7. **Blum, B.***, and Benvenisty, N.*, The tumorigenicity of human embryonic stem cells. **Adv. Cancer Res.**, 100:133-158, (2008)
   ***Corresponding Author**

8. **Blum, B.**, Bar-Nur, O., Golan-Lev, T. and Benvenisty, N., Involvement of the anti apoptotic gene Survivin in the tumorigenicity of human embryonic stem cells. **Nat. Biotechnol.**, 27:281-287, (2009)

9. Straussman, R., Nejman, D., Roberts, D., Steinfeld, I., **Blum, B.**, Benvenisty, N., Simon, I., Yakhini, Z., Cedar, H., Developmental programming of CpG island methylation profiles in the human genome. **Nat. Struct. Mol. Biol.**, 16:564-571, (2009)

10. **Blum, B.***, and Benvenisty, N., The tumorigenicity of diploid and aneuploid human pluripotent stem cells. **Cell Cycle**, 8:3822-3830, (2009)
***Corresponding Author**

11. Sadacca, L.A., Lamia, K.A., deLemos, A.S., **Blum, B.**, Weitz, C.J., An intrinsic circadian clock of the pancreas is required for normal insulin release and glucose homeostasis. **Diabetologia**, 54:120-124, (2010). PMCID: 2995870

12. **Blum, B.**, Hrvatin, S., Schuetz, C., Bonal, C., Rezania, A., Melton, D.A., Functional beta-cell maturation is marked by an increased glucose threshold and by expression of urocortin 3. **Nat. Biotechnol.**, 30:261-264, (2012)

13. **Blum, B.***, Roose, A.N., Barrandon, O., Maehr, R., Arvanites, A.C., Davidow, L.S., Davis, J.C., Peterson, Q.P., Rubin, L.L., Melton, D.A*., Reversal of β cell de-differentiation by a small molecule inhibitor of the TGFβ pathway. **eLife,** e02809, (2015)
***Corresponding Author**

D. Research support

Juvenile Diabetes Research Foundation **09/01/2011 – 08/31/2014**
3-2011-347
Functional maturation of beta-cells: I propose to research the issue of the development of functional or "mature" pancreatic beta-cells. I propose using Ucn3 as a marker for a high-throughput-screening to find candidate factors that stimulate mature GSIS in immature mouse islets and in beta-cells derived from embryonic stem cells (ESCs). Additionally, I propose to test promising genes identified in the microarray for their ability to control beta-cells maturation *in vivo* and *in vitro.*
Role: PI

EMBO **09/01/2009 – 08/31/2011**
ALTF 515-2009
Analysis of beta-cell regeneration in mice using direct cell cycle visualization: Use of a transgenic mouse model in which the cell cycle state of every cell in the animal can be directly observed in real time. I will combine this system with a lineage tracing system for mature beta cells. This will enable me to 1) elucidate spatio-temporal kinetics and proliferation niches during mature beta cell regeneration, 2) detect cell cycle mechanisms participating in each type of regeneration, and 3) identify activated signaling pathways specific to regenerating beta cells. Finally, I will attempt to extrapolate the results to expand transplantable beta-cell cultures in vitro.