

BURHAN GHARAIBEH, Ph.D.

Assistant Research Professor / Lab Manager
Stem Cell Research Center
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Education

- Texas Tech University, Lubbock, TX
Ph.D. in Biological Sciences 1997
Dissertation: "Systematics, distribution, and zoogeography of mammals of Tunisia"
Program director: Dr. Robert J. Baker. GPA 3.86/4.0
- Yarmouk University, Irbid, Jordan
M.Sc. in Zoology 1988
Thesis: "Reproduction and growth of three species of Chaetodontidae (Pisces, Perciformes) in the Jordan Gulf of Aqaba"
Program director: Dr. Neil C. Hulings. GPA 83.0%
- Yarmouk University, Irbid, Jordan
B.Sc. in Biological Sciences 1984
GPA 79.1%

Research Experience

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| Nov 05- Current | Research Assistant Professor. Stem Cell Research Center, Department of Orthopedic Surgery, University of Pittsburgh |
| Mar 03- Nov 05 | Research Specialist. Stem Cell Research Center, Department of Orthopedic Surgery, University of Pittsburgh. |
| Apr 01- Mar 03 | Post-Doctoral Fellow. Division of Hematology/Oncology, Children's Hospital of Pittsburgh. |
| June 98- Apr 01 | Post-Doctoral Fellow. Department of Human Genetics, University of Pittsburgh and The Pittsburgh Cytogenetics Laboratory, Magee-Women's Hospital of UPMC. |
| Jan 96- Aug 97 | Research Assistant. Natural Science Research Lab. The Museum, Texas Tech University, Lubbock, Texas. |

Research Grants

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| 01/07-06/09 | Cook Myosite: Sponsored project for years 5-6". PI. 30% (3.6 Calendar months). \$250,000 direct costs |
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Pending Funding	American Heart Association Grant-in-aid/ Functioning Cardiomyocyte induction of human skeletal muscle derived stem cells using 3-Dimensional gel bioreactor. Consultant.
Pending Funding	Grant Number NIH-R21 proposal for PAR-06-407: Three-Dimensional Cardiac Gel Bioreactor for Functioning Cardiomyocyte Induction from Human Skeletal Muscle Derived Stem Cell. Co-Investigator.
Jan 03 - Dec 04	Research Advisory Committee. Children's Hospital of Pittsburgh. "Aberrant DNA Synthesis Mediated by the c-Myc Oncogenes." Fellowship Funding. \$ 85,000.
1998	Deanship of Scientific Research, Jordan University of Science and Technology (Principal Investigator). "Natural History Museum at the Jordan University of Science and Technology." Equivalent of \$ 18,500.
1996	Section of Mammals, Carnegie Museum of Natural History (Predoctoral minigrant). "Study of the systematics, distribution, and zoogeography of mammals of Tunisia." \$4,000

Teaching Experience

Feb 98- June 98	Assistant Professor. Department of Applied Biology, Jordan University of Science and Technology (JUST), Jordan. <i>Courses taught: Animal Physiology. Spring, 1998.</i> <i>Enrollment: 93</i> <i>General Biology. Spring, 1998. Enrollment: 123</i> <i>Research Seminar. Spring, 1998. Enrollment: 7</i>
Sep 92- Dec 95	Teaching Assistant. Department of Biological Sciences, Texas Tech University. <i>Labs taught: Vertebrate Structure and Development, Comparative Animal Physiology, and Human Anatomy and Physiology</i>
Sep 90- Dec 91	Teaching Assistant. Department of Biological Sciences, JUST, Jordan. <i>Labs taught: Invertebrate Zoology and General Biology.</i>
Feb 88- Aug 88	Part-time lecturer. Department of Biological Sciences, Yarmouk University, Jordan. <i>Labs taught: Comparative Chordate Anatomy.</i>
Sep 84- Jan 84	Teaching and Research Assistant. Department of Biological Sciences, Yarmouk University. <i>Labs taught: Comparative Chordate Anatomy, Marine Biology, and Ecology.</i>

Journal Publications

1. **Gharaibeh, B**, Lu, A, J Tebbets, Zheng, B, Feduska, A, Crisan, M, Peault, B, Cummins, J and Huard. 2008. Isolation of murine muscle-derived stem cells by differential adherence characteristics (The Preplate Technique). Submitted to Nature Protocols.
2. Zheng, B., B. Cao, M. Crisan, B. Sun, G. Li, A. Logar, S. Yap, J.B. Pollett, L. Drowley, T. Cassino, B. **Gharaibeh**, B.M. Deasy, J. Huard, and B. Peault. 2007. Prospective identification of myogenic endothelial cells in human skeletal muscle. *Nat Biotechnol.* 25:1025-34.
3. Pollett, J.B., K.A. Corsi, K.R. Weiss, G.M. Cooper, D.A. Barry, **B. Gharaibeh**, and J. Huard. 2007. Malignant transformation of multipotent muscle-derived cells by concurrent differentiation signals. *Stem Cells.* 25:2302-11.
4. Deasy, B.M., A. Lu, J.C. Tebbets, J.M. Feduska, R.C. Schugar, J.B. Pollett, B. Sun, K.L. Urish, **B.M. Gharaibeh**, B. Cao, R.T. Rubin, and J. Huard. 2007. A role for cell sex in stem cell-mediated skeletal muscle regeneration: female cells have higher muscle regeneration efficiency. *J Cell Biol.* 177:73-86.
5. Clause, K., J.P. Tinney, L.J. Liu, **B. Gharaibeh**, K.L. Fujimoto, W.R. Wagner, J.C. Ralphe, B.B. Keller, J. Huard, and K. Tobita. 2007. Functioning engineered cardiac tissue from skeletal muscle-derived stem cells. *Circulation Research.* 101:E56-E56.
6. Deasy BM, **Gharaibeh BM**, Pollett JB, Jones MM, Lucas MA, Kanda Y, Huard J. 2005. Long-Term Self-Renewal of Postnatal Muscle-derived Stem Cells. *Mol Biol Cell.* Jul;16(7): 3323-33.
7. Oshima H, Payne TR, Urish KL, Sakai T, Ling Y, **Gharaibeh B**, Tobita K, Keller BB, Cummins JH, Huard J. 2005. Differential myocardial infarct repair with muscle stem cells compared to myoblasts. *Molecular Therapy.* 12(6): 1130-1141.
8. Payne TR, Oshima H, Sakai T, Ling Y, **Gharaibeh B**, Cummins J, Huard J. 2005. Regeneration of dystrophin-expressing myocytes in the mdx heart by skeletal muscle stem cells. *Gene Ther.* Aug;12(16): 1264-74.
9. Saunders, WS, M Shuster, X Huang, **BM Gharaibeh**, AH Enyenihi, I Petersen, and SM Gollin. 2000. Chromosomal Instability and Cytoskeletal Defects in Oral Cancer Cells. *Proceeding of the National Academy of Sciences*, 97(1): 303-308.
10. Rifai, L, WN Al-Melhim, **BM Gharaibeh** and ZS Amr. 2000. The diet of the desert Eagle Owl, *Bubo bubo ascalaphus*, in the Eastern desert of Jordan. *Journal of Arid Environments.* 44: 369-372.

11. Gharaibeh, BM and DA Schlitter. 1997. Mammals of the Holy Land (book review). *Journal of Mammalogy*, 78(4): 1290-1291.
12. Gharaibeh, BM and C Jones. 1996. *Myosciurus pumilio*, the West African pygmy squirrel. *Mammalian Species*, 523: 1-3.
13. Gharaibeh, BM and M Qumsiyeh. 1995. *Otonycteris hemprichii*, Hemprich's long-eared bat. *Mammalian Species*, 517: 1-4.
14. Goetze, JR, FD Yancey, II, C Jones, and BM Gharaibeh. 1995. Noteworthy records of mammals from the Edwards Plateau of central Texas. *Texas Journal of Science*, 47(1): 3-8.
15. Yancey, FD, II, JR Goetze, BM Gharaibeh, and C Jones. 1995. Distributional records of small mammals from the Southwestern Rolling Plains of Texas. *Texas Journal of Science*, 47(2): 101-105.
16. Gharaibeh, BM and NC Hulings. 1990. Reproduction of *Chaetodon austriacus*, *C. fasciatus* and *C. paucifasciatus* (Chaetodontidae, Perciformes) in the Jordan Gulf of Aqaba. *Environmental Biology of Fishes*, 29: 67-72.

Book Chapters

17. Gharaibeh, BM and C Jones. 1999. *Mephitis macroura*. Pp. 186-188, in The Smithsonian Book of North American Mammals. Smithsonian Institution Press. (D. Wilson and S. Ruff, Eds.). 750 pp.
18. Hugh H Genoways (Editor) Robert J Baker (Editor) Burhan M Gharaibeh (Illustrator) Terry A. Vaughan (Illustrator). 1996. Contributions in Mammalogy : A Memorial Volume Honoring Dr. J Knox Jones, JR. Museum of Texas Tech University. 315 pp.

Proceedings

19. Baker, RJ, B Albin, RD Bradley, JJ Bull, J Burns, KA Clark, G Edson, RE Estrada, E Farley, CB Fedler, BM Gharaibeh, RL Hammer, C Jones, R Monk, JT Montford, G Moore, NC Parker, J Raulings, A Sansom, DJ Schmidly, RW Sims, H Wichman, and FD Yancey. 1996. Natural Science database: Resource Management and Public Health. Proceedings of the 4th Annual Conference of the Organization of Fish and Wildlife Information Managers. July 1996: 10-20.

Recent Abstracts and Posters

1. Gharaibeh B, Tebbets J, Lu A, Lavasani M, Tobita K, Phillippi J, Wagner W, Huard J. Isolation of Muscle Derived Cells from Various Mammalian Species by the Preplate Technique. The Orthopaedic Research Society (ORS) 54th Annual Meeting; March 2-5, 2008; San Francisco, CA.

2. Lavasani M, Gehrman S, **Gharaibeh B**, Clark K, Pollett J, Kaufmann R, Goitz R, Huard J. Role of Venous Nerve Guides in Peripheral Nerve Regeneration. The Orthopaedic Research Society (ORS) 54th Annual Meeting; March 2-5, 2008; San Francisco, CA.
3. Lorenzo Soletti, Alejandro Nieponice, **Burhan Gharaibeh**, Nav Y Gupta, Jianjun Guan, Yi Hong, Johnny Huard, William R Wagner, and David A Vorp. Development of a Tissue-Engineered Vascular Graft in Rat and Pig Models. ISACB. Bordeaux, France. 2008.
4. Alejandro Nieponice, NavYash Gupta, Lorenzo Soletti, Burhan Gharaibeh, Bridget M. Deasy, Jianjun Guan, Johnny Huard, William R. Wagner and David A. Vorp. Eastern Vascular Society, Boston, Sept. 2008.
5. Kelly C. Clause, Joseph P. Tinney, Li J. Liu, **Burhan Gharaibeh**, Johnny Huard, Jonathan A. Kirk, Sanjeev G. Shroff, Kazuro L. Fujimoto, William R. Wagner, John C. Ralphe, Bradley B. Keller, Kimimasa Tobita. Cardiomyocyte induction from skeletal muscle derived stem cells using cell aggregates and a three-dimensional cardiac gel bioreactor. ISSCR 2008. Philadelphia.
6. Deasy, BM, Aiping Lu , Karin Corsi, Jonathan Pollett , Anne Olshanski, Ken Urish, Jessica C. Tebbets, **Burhan M. Gharaibeh**, and Johnny Huard. (2005) Sex differences in muscle stem cells. FASEB Conference, Muscle satellite and stem cells, 4th International Meeting, Tuscon, AZ.
7. Deasy BM, Lu A, Tebbets JC, Urish KM, **Gharaibeh BM**, Payne TR, Kekre N, Jones MM, Rubin RT, and Huard J. (2005) Sex-related Differences Between Male And Female Muscle-derived Stem Cells. 51st Annual Orthopedic Research Society Meeting. Washington D.C.
8. Nieponice, A., Deasy, **B.M.**, **Gharaibeh**, B., Soletti, L., Guan, J., Huard, J., Wagner, W.R., Vorp, D.A. Characterization of Muscle Derived Stem Cells within a Novel Tissue Engineered Vascular Graft. Tissue Engineering Society International, December 2005, Shanghai, China.
9. Nieponice A, **Gharaibeh B**, Soletti L, Deasy BM, Guan J, Huard J, Wagner WR, and Vorp DA. Assessment of a tissue engineered vascular graft fabricated with muscle-derived stem cells and a biodegradable elastomeric scaffold. ISCAB
10. Oshima H, Payne TR, Urish KL, Sakai T, Ling Y, **Gharaibeh B**, Tobita K, Keller BB, Cummins JH, Huard J. June 2005. Muscle stem cells provide superior infarct repair when compared with myoblasts. American Society of Gene Therapy's 8th Annual Meeting. St. Louis, MO.
11. Oshima H, Payne TR, Urish KL, Sakai T, Ling Y, **Gharaibeh B**, Tobita K, Keller BB, Cummins JH, Huard J. June 2005. Improved myocardial infarct repair

with muscle stem cells compared with myoblasts. Regenerate Conference. Atlanta, GA.

12. Payne TR, Oshima H, Okada M, **Gharaibeh B**, Momoi N, Tobita K, Keller BB, Peng H, Huard J. June 2005. Functional repair of infarcted hearts mediated by skeletal muscle stem cells and their secretion of VEGF. FASEB Conference on Skeletal Muscle and Stem Cells. Tucson, AZ.
13. Payne TR, Oshima H, Okada M, **Gharaibeh B**, Urish K, Tobita K, Momoi N, Keller BB, Peng H, Huard J. June 2005. Skeletal muscle stem cells for cardiac repair; survival, differentiation, angiogenesis, and VEGF expression. International Society for Stem Cell Research 3rd Annual Meeting, San Francisco, CA.
14. Pollet JB, Olshanski A, **Gharaibeh B**, Corsi K, Usas A, Peng H, and Huard J. Pleuripotency, a double edged sword: mixed differentiation signals induce tumor formation in vivo. American Association for Cancer Research, 96th Annual Meeting, April 16-20, 2005, Anaheim, CA.
15. Urish K, Deasy BM, Payne TR, Oshima H, Kekre N, Tebbets J, **Gharaibeh B**, Lu A, Piganelli J, Huard J. Resistance to stress is an indicator of the regenerative capacity of skeletal stem cells. 3rd Annual Meeting of the International Society for Stem Cell Research. June 2005, San Francisco, CA.
16. Deasy, B.M, **Gharaibeh, B.M.**, Jones M.M., Lucas, M.A., Huard J. (2004) Long-Term Proliferation Potential Of Muscle-Derived Stem Cells: Muscle-derived Stem Cells Have Highly Extended, But Not Unlimited, Expansion Capability. International Society for Stem Cell Research June, 2004. Boston, MA.
17. Deasy, B.M., **Gharaibeh, B.M.**, M. Jones, A. Lu, J. Tebbets, J. Huard. (2004). Gender Differences in Transplantation Efficiency using Muscle-derived Stem Cells for Muscular Dystrophy. American Society for Gene Therapy. June 2004. Minneapolis, MN.
18. Deasy, B.M, **Gharaibeh, B.M.**, Jones M.M., Lucas, M.A., Huard J. (2004) Muscle-derived Stem cells display and extended but not unlimited, expansion capability: Implication for Muscle Regeneration. American Society for Gene Therapy. June 2004. Minneapolis, MN.
19. Payne TR, Oshima H, Sakai T, Ling Y, **Gharaibeh B**, Cummins JH, Huard J. May 2004. "Muscle stem cells deliver dystrophin and adopt a cardiac phenotype through both differentiation and fusion in the dystrophic (mdx) heart. American Society of Gene Therapy Conference, Minneapolis, MN. Molecular Therapy. Volume 9. Supplement 1.
20. Deasy, B.M, **Gharaibeh, BM**, Jones, M, Lucas, M, Huard, J. 2004. Long-term proliferation potential of Muscle-derived stem cells. The 2cd Annual

Meeting of the International Society of Stem Cell Research, Jun 10-13, Boston, MA.

21. Deasy, B.M, **Gharaibeh, BM**, Jones, M, Lu, A, Tebbets, J, Huard, J. 2004. Gender differences in transplantation efficiency using muscle-derived stem cells for muscular dystrophy. The 7th annual Meeting of the American Society of Gene Therapy, Minneapolis, MN.
22. Deasy, B.M, **Gharaibeh, BM**, Jones, M, Lucas, M, Huard, J. 2004. Muscle-derived stem cells display an extended but not unlimited, expansion capability: implication for muscle regeneration. The 7th annual Meeting of the American Society of Gene Therapy, Minneapolis, MN.
23. Kochmar S, Bay C, **Gharaibeh B**, Surti U. June 22-25, 2000. 47,XX, +inv dup(15)(q12) in a patient with severe mental retardation and dysmorphic features. Poster Presentation. The Association of Genetic Technologists 25th Anniversary Meeting, Scottsdale, Arizona. Abstract # 31.
24. McPherson EW, Clemens MM, Kochmar S, **Gharaibeh B**, Surti U. October 3-7, 2000. Supernumerary ring chromosome 11 mosaicism causing retinal colobomas. Poster Presentation. The American Society of Human Genetics 50th Annual Meeting, Philadelphia. Abstract # 846.
25. Huang X, Shuster M, Godfrey TE, Saunders WS, **Gharaibeh BM**, Gollin SM. October 3-7, 2000. Gene amplification occurs via breakage-fusion-bridge cycles in oral cancer cells. Poster Presentation. The American Society of Human Genetics 50th Annual Meeting, Philadelphia. Abstract # 314.
26. **Gharaibeh, B. M.**, X. Huang, W. S. Saunders, I. Petersen, S. M. Gollin. October 19-23, 1999. Endoreduplication in oral squamous cell carcinoma (OSCC). Poster Presentation. The American Society of Human Genetics 49th Annual Meeting, San Francisco. Abstract # 890.
27. Huang, X., W.S. Saunders, **B. M. Gharaibeh**, M. Shuster, A. H. Enyehini, and S. M. Gollin. October 19-23, 1999. Aneuploidy, chromosomal instability, and cytoskeletal defects in oral squamous cell carcinoma (OSCC) cells. The American Society of Human Genetics 49th Annual Meeting, San Francisco. Abstract # 902.
28. **Gharaibeh, B. M.** May 18, 1998. G-banding data for *Meriones shawi* (Duvernoy, 1842) and a reevaluation of the phylogeny of the jirds (Rodentia, Gerbillidae). The First Annual Scientific Day of the Faculty of Science & Arts, Jordan University of Science and Technology, Irbid, Jordan.
29. **Gharaibeh, B. M.** March 31, 1995. Geographic variation in the elephant shrew *Elephantulus rozeti* (Mammalia, Macroscelididae) from Tunisia. 9th Annual Graduate Research Forum, Department of Biological Sciences, Texas Tech University, Lubbock, Texas.

University of Pittsburgh Service Committees

Institutional Review Board (IRB), The University of Pittsburgh and UPMC.
Standing Member 2007- Current

Animal Research and Care Committee (ARCC), Children's Hospital of Pittsburgh of UPMC.
Member 2004- Current

Honors and Awards

Honorary Research Associate, Natural Science Research Laboratory, Museum of Texas Tech University, Lubbock, Texas.

Professional Societies Memberships

2008	American Society for Gene Therapy
2004	American Orthopedic Society
2004	International Stem Cell Research Society International Committee
1999	American Society of Human Genetics
1999	Pittsburgh Cytogenetics Club
1993- 2000	American Society of Mammalogists
1993- 1998	Texas Society of Mammalogists
1993- 1998	Texas Academy of Sciences
1993- 1998	Southwestern Association of Naturalists
1988	Royal Society for the Conservation of Nature, Amman, Jordan
1996	Tunisian Life Sciences Society
1996	Tunisian Scientific Consortium

Community Outreach

Science Advisory Committee, Pittsburgh Tissue Engineering Initiative, McGowan Institute for Regenerative Medicine and Carnegie Science Center. Design consultant. "If A Star Fish Can Grow An Arm, Why Can't I?" Opening April 2008.

Popular scientific presentations on the topic of stem cells, bioethics, and regenerative medicine.

- Temple Mount Sinai Adult Education Program, Squirrel Hill, Pittsburgh.
- Advanced Placement Class, Central Catholic High School, Oakland, Pittsburgh.
- PTEI Teacher-Workshop, Central Catholic High School, Pittsburgh.
- Pittsburgh Public School Gifted Program, Pittsburgh.

Languages

Spanish- speak, read, and write with basic competence.

French- basic knowledge.

Arabic - native language