

Curriculum Vitae

Name: Dan Gazit
Place of Birth: Jerusalem, Israel
Marital Status: Married; 6 children.

EDUCATION:

Ph.D. (1991) Hebrew University of Jerusalem
D.M.D. (1976) Hebrew University of Jerusalem

POSTDOCTORAL TRAINING:

1991-1992 Visiting Scientist, Genentech Inc., San Francisco, CA, USA.
1990-1992 Visiting Assistant Professor, Department of Growth & Development, University of California, San Francisco, USA.
1990-1991 Visiting Assistant Professor, Division of Oral Pathology, Department of Stomatology, University of California, San Francisco (UCSF), USA.
1987 Visiting Scientist, Department of Biology, Case Western Reserve University, Cleveland, Ohio, USA.
1987 Visiting Scientist, Department of Biology, University of California, San Diego (UCSD), USA.

CERTIFICATION:

Specialist, Oral Pathology, Israel Ministry of Health (# 367) – 1986.

LICENSURE:

Dental Medicine, Israel Ministry of Health (# 2625) - 1976.

ACADEMIC APPOINTMENTS:

- 2006 – present Director, Skeletal Regeneration and Stem Cell Therapy Program, Department of Surgery and Cedars-Sinai Regenerative Medicine Institute (CS-RMI), Cedars-Sinai Medical Center, Los Angeles, CA.
- 2006 – present Director, Molecular & Micro Imaging Core, Cedars- Sinai Medical Center, Los Angeles, CA.
- 2002- present Professor, Hebrew University of Jerusalem.
- 1998- 2002 Associate Professor, Hebrew University of Jerusalem.
- 1992- 1998 Tenured Senior lecturer in Oral Pathology, Hebrew University of Jerusalem
- 1986 Lecturer in Oral Pathology, Hebrew University of Jerusalem
- 1981-1985 Instructor in Oral Pathology, Hebrew University of Jerusalem.

UNIVERSITY APPOINTMENTS:

- 2012-present Member, Tenure Faculty Appointments Committee, Hebrew University of Jerusalem
- 2010-present Member, Experimental Sciences Faculty Appointments and Promotions Committee, Hebrew University of Jerusalem
- 2005-present Member, Executive Committee of the Hebrew University Board of Governors
- 2005-present Chair, Research Committee, Faculty of Dental Medicine, Hebrew University of Jerusalem
- 2005-2010 Director, Hebrew University of Jerusalem Center for Converging Sciences and Technologies
- 2002-2003 Member, Rector's committee for the foundation of graduate school, The Hebrew University of Jerusalem.
- 2002-2003 Member, Dean of Students Committee, The Hebrew University of Jerusalem
- 2001-2003 Chairman, Biotechnology Steering Committee, The Hebrew

University of Jerusalem

1999-2004 Member, Steering Committee, Gene Therapy Center,
Hadassah Medical Center, Jerusalem

1998- 2003 Chairperson, Faculty Research Day, The Hebrew University of
Jerusalem

1997-2003 Head, Hebrew University Dental Sciences Graduate Program

1996-2001 Head, Oral Pathology Biopsy Facility,
The Hebrew University - Hadassah Faculty of Dental Medicine

1994-1998 Representative of Senior Lecturers and Associate Professors
to the Senate of the Hebrew University of Jerusalem

1984-1985 Representative of Instructors to the Faculty Council,
the Hebrew University-Hadassah School of Dental Medicine

VISITING POSITIONS –

2003-2010 Visiting Professor, University of Virginia School of Medicine

1999 Visiting Professor, Harvard Medical School, Bone Biology Research

1999 Visiting Professor, Boston University, Bone Biology Research

1999 Visiting Professor, Leiden Medical Center, Bone Biology Research

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

Orthopaedic Research Society
International Society for Stem Cell Research

PROFESSIONAL MEMBERSHIPS:

2012-present Member, Editorial Board of Journal of Regenerative Medicine and
Tissue Engineering

2010- present Chair, Calcified Tissues Review Committee, Israel Ministry of
Health.

2010-2012 Chair, Progenitors and Stem Cells Topic Committee, Orthopaedic
research Society

- 2010-2013 Member, Tissue Engineering Committee, American Society of Gene & Cell Therapy (ASGCT)
- 2009- present Member, Israel Science Foundation, Cellular Biology Committee.
- 2007 - present Member, Editorial board of Journal of Tissue Engineering and Regenerative Medicine
- 2008- present Member, Editorial board of Gene Therapy Journal
- 2004-2013 Member, American Society of Gene Therapy (ASGT) Musculo-Skeletal Disorder Committee
- 2005-present Head, Research Committee, The Hebrew University-Hadassah Faculty of Dental Medicine
- 2005 Member, Tissue Engineering Society International (TESI) Scientific Advisory Committee
- 2004-present Collaborator, Tissue Engineering Resource Center (P41), Tufts University, MA, USA
- 1993-1995 Ad Hoc Committee for Revision of Teaching Curriculum in Pre-clinical Studies, The Hebrew University-Hadassah Faculties of Medicine and Dental Medicine
- 1984-1985 Lecturers-Instructors Committee,
The Hebrew University-Hadassah Faculty of Dental Medicine
- 1983-1985 Teachers-Students Committee,
The Hebrew University-Hadassah School of Dental Medicine
- 1983-1984 Computer Committee,
The Hebrew University - Hadassah Faculty of Dental Medicine

TEACHING ACTIVITIES:

Administrative-Educational Activities

- 1999-2003 Chairperson, Faculty Research Day, Hebrew University-Hadassah Faculty of Dental Medicine.
- 1997-2000 Chairman, Oral Pathology Committee,

Israel Dental Association-Scientific Council

1997-2003 Head, Hebrew University Dental Sciences Graduate Program.

1997-1999 Chairperson, Organizing Committee,
International Workshop of Calcified Tissues

1990 Chairperson, Israeli Symposium on the Role of Bone Biopsies in
Metabolic Bone Diseases.

1986-1990 Chairperson, Faculty Research and Clinical Forum, The Hebrew
University-Hadassah, Faculty of Dental Medicine, Jerusalem

Teaching Experience:

B.Sc.

2003-2010 Undergraduate course in Stem Cells Engineering and Applications
in Molecular Medicine, The Hebrew University-Hadassah Faculty
of Medicine, Medical Science.

2001-present Undergraduate course in Craniofacial Tissue Engineering, The
Hebrew University-Hadassah Faculty of Medicine, Medical
Science.

1996-2003 Undergraduate course in Physiological Biochemistry,
The Hebrew University-Hadassah Faculty of Medicine, School
of Pharmacy.

1995-1999 Undergraduate course in Oral Biology
The Hebrew University-Hadassah Faculty of Dental Medicine.

1991-1992 Undergraduate course in Oral Pathology,
UCSF, San Francisco, CA. Faculty of Dental Medicine.

1982-1999 Undergraduate course in General Pathology
The Hebrew University-Hadassah Faculties of Medicine and
Dental Medicine.

1982-present Major undergraduate course in Oral Pathology and Tissue
Engineering in the Craniofacial Complex
The Hebrew University-Hadassah Faculty of Dental Medicine.

MSc./Ph.D.

2015 - Graduate Course (Ph.D.): Cedars-Sinai Graduate Program in

Biomedical Science and Translational Medicine Stem Cell Module, Cedars Sinai Medical Center.

- 2013- present: Graduate course (MSc., Ph.D.): Challenges and Applications in Skeletal Tissue Engineering . The Hebrew University-Hadassah Graduate program, Dental Sciences.
- 2009-2014 Graduate Course (Ph.D.): Stem Cells - Biology and Imaging. Cedars Sinai Medical Center.
- 2006- 2010 Graduate Course (MSc., Ph.D.): Cell and Tissue Engineering. The Tel Aviv University, Faculty of Engineering, Biomedical Engineering.
- 2004-2008 Graduate Course (MSc., Ph.D.): Stem Cell-Based Spine Biologics. Biomedical Sciences and Department of Neurosurgery, University of Virginia.
- 1999- present Graduate Course (MSc., Ph.D.): Biotechnology of the Cranio-facial Complex. The Hebrew University-Hadassah Graduate Program, Dental Sciences.
- 1998-2003 Graduate Course (MSc., Ph.D.): Gene Therapy , Genetics. The Hebrew University of Jerusalem, Medical Sciences.
- 1985-2012: Graduate course (MSc., Ph.D.): Bone Structure and Function. The Hebrew University-Hadassah Graduate program, Dental Sciences.
- 1985-present: Graduate Course (MSc., Ph.D.): Biological Mineralization, The Hebrew University-Hadassah Graduate Program, Dental Sciences.

RESPONSIBLE FOR THE FOLLOWING TRAINEES:

D.M.D students:

- 2005-2008 A. Faybish
- 1988-1990 O. Rodberg (a prize winning thesis)
- 1987-1989 M. Martin
- 1986-1988 R. Sonenshein
- 1986-1988 J. River
- 1986-1988 Y. Kohen
- 1986-1988 L. Holzman

1985-1987	A. Laron
1985-1987	E. Weinstein
1984-1986	M. Karmish (a prize winning thesis)
1981-1984	A. Massarawa

M.Sc. students:

2014-2015	M. Bez
2014-present	Y. Schari
2013-present	E. Yalon
2011-2012	D. Cohn-Yackubovich
2011-2012	G. Shapiro
2010-2012	L. Ben-Asaf
2010-2012	Y. Navaro
2009-2013	A. Lavi (D.M.D. student; 3M Inc. award for young researchers)
2008-2012	S. Benjamin
2008-2009	Y. Bar-On (Rector's fellowship for excellence)
2008-2012	O. Mizrahi (Collgate Inc. award for young researchers, Graduated <i>Summa Cum Laude</i>)
2007-2009	I. Kallai
2006-2009	A. Ben Arav
2005-2008	Y. Steinhardt (Rector's award for excellence)
2004-2007	Y. Tal
2004-2005	D. Sheyn
2004-2005	N. Kimelman
2001-2002	A. Mackovitzki
2000-2002	I. Bar
2000-2001	H. Aslan
2000-2001	Y. Gafni
1998- 2001	L. Tzur (Wolf foundation award for excellence)
1995-1998	A. Gandelman
1995-1996	G. Turgeman

Ph.D. Students:

2015-	M. Bez
2012-present	G. Shapiro (Dexon-Periochip award, Katzir travel award, Israel Society for Stem Cell Research- Young Investigator Award 2014).
2012-present	D. Cohn-Yackubovich (Dexon-Periochip award, Katzir travel award)
2009-2014	I. Kallai (Israel Ministry of Science scholarship, Wolf Foundation Scholarship)
2009-2010	M. Gabbay
2005-2011	N. Kimelman (Kaye innovations award, Rector's scholarship for excellence, Israel Ministry of Science scholarship, Foulkes foundation award, Graduated <i>Cum Laude</i>)
2005-2010	D. Sheyn (Kaye innovations award, Rector's scholarship for excellence, Isreal Ministry of Science scholarship)
2001-2009	Y. Gafni (Kaye innovations award, Isreal Ministry of Science scholarship, Foulkes foundation award)
2001- 2008	H. Aslan (Horwitz scholarship for excellent students, Rector's scholarship for excellence, Israel Ministry of Science scholarship, Kaye innovations award)
1999-2007	G. Pelled (Rector's scholarship for excellence, Kaye innovations award, The Golda Meir Fellow for Excellence)
1996-2001	G. Turgeman (Wolf foundation award for excellence, Kaye innovations award, Foulkes foundation award)
1996-2001	S. Zhou (Rector's scholarship for excellence)

AWARDS, PROFESSIONAL RECOGNITION, AND ACTIVITIES:

2011	Issac Kaye innovations award
2008-present	Member, Editorial board of Gene Therapy Journal
2007-present	Member, Editorial board of Journal of Tissue Engineering and

- Regenerative Medicine
- 1997-2000 Chairman, Oral Pathology Committee,
Israel Dental Association-Scientific Council
- 1997-1999 Chairperson, Organizing Committee,
International Workshop of Calcified Tissues
- 1995-1997 Consultant, Novo Nordisk, Denmark.
- 1992-2002 Consultant, Genetics Institute/Wyeth Pharmaceuticals, Cambridge,
USA.
- 1992-1994 Consultant, Zymogenetics, Seattle, Washington USA
(a subsidiary of Novo Nordisk, Denmark).
- 1990 Chairperson, Israeli Symposium on the Role of Bone Biopsies in
Metabolic Bone Diseases
- 1988- present Reviewer, The Israel Science Foundation, Bi National Science
Foundation, GIF (German- Israeli Foundation for Scientific
Research and Development), Israel Ministry of Science, Israel
Ministry of Health, Authority for Research and Development, The
Hebrew University of Jerusalem, Israel Cancer Association.
- 1987 The Golda Meir Fellow for Excellence, Doctoral Degree,
The Hebrew University of Jerusalem, Israel.
- 1987 Ciba Foundation Bursary for Ciba Symposium, England:
Cell and molecular biology of hard tissues.
- 1986-1990 Chairperson, Faculty Research and Clinical Forum, the Hebrew
University-Hadassah, Faculty of Dental Medicine, Jerusalem.

Ad Hoc Manuscript Reviewer for the following Journals and Associations:

Molecular Therapy

Gene Therapy

Tissue Engineering

Biomacromolecules

Bone

European Journal of Biochemistry

Archives of Oral Biology
Journal of Bone and Mineral Research
Calcified Tissues International
Polymers for Advanced Technologies
Journal of Orthopaedic Research
Journal of Dental Research
Rheumatology
The Anatomical Record
Steroids
Biomaterials
Regenerative Medicine
Stem Cells
Journal of Clinical Investigation
Faculty of 1000
Journal of Controlled Release

BUSINESS INITIATIVES:

2008 Co-founder of Start-Up Company Theracell.
2005 Co-founder of Start-Up Company Nanospine.
2001 Co-founder with The Hebrew University of Start-Up company
SBT (Skeletal Biological Therapy).

INVITED LECTURES:

2008 Orthopedic Research Society annual meeting: The role of adult stem cells in degeneration and regeneration of intervertebral disc.
2008 Israeli Stem Cell Society, 2nd International stem cell meeting: Genetically modified stem cells as a platform for skeletal regenerative medicine.
2008 Seventh Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas NV: Stem cell-based spinal fusions.
2008 American Society for Bone and Mineral Research (ASBMR) annual meeting, Toronto, Canada: The role of functional imaging in evaluation of gene and stem cell therapies for bone repair.

- 2009 Eighth Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas NV: Stem cell-based spinal fusions.
- 2009 TMJ Bioengineering Conference, Denver CO: Stem Cell Based Skeletal Tissue Engineering
- 2009 IV Simpósio Internacional: Terapias Avançadas & Células-Tronco, Recife Brazil: Functional Imaging for Skeletal Stem Cell Based Tissue engineering.
- 2010 Ninth Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV: Local Delivery of Oxygen and Stem Cells for Spine Repair.
- 2011 Tenth Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV: Stem Cell Imaging in Spinal Diseases: Tracking, Fate and Therapy.

SCIENTIFIC CONFERENCE PRESENTATIONS (LAST FIVE YEARS):

1. **Dan Gazit**, Dima Sheyn, Martin Rüthemann, Gadi Pelled, Yoram Zilberman, Jess G Snedeker, Injectable Engineered Stem Cells Induce Mechanically Rigid Posterior Spine Fusion, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, Nevada, 2009.
2. **Dan Gazit**, Yoram Zilberman, Nadav Kimelman, Gadi Pelled, Galit Saar, Hadassah Shinar, Keren Keinan-Adamsky, David Kaplan, Carmen Preda, Gil Navon. Advanced MR-Analysis of Native and Stem Cell-Based Engineered Annulus Fibrosus, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, Nevada, 2009.
3. Gadi Pelled, Nadav Kimelman, Yoram Zilberman, Zulma Gazit, **Dan Gazit**, Synthetic Oxygen Carriers Enhance Bone Defect Regeneration Induced by BMP-Expressing Mesenchymal Stem Cells, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, Nevada, 2009.
4. **Dan Gazit**, Ayelet Ben-Arav, Gadi Pelled, Yoram Zilberman, Colleen Hock, David Reinholds, Edward Schwarz, In Vivo Bone Tissue Regeneration Using rAAV-BMP2-Coated Allografts, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, Nevada, 2009.
5. Gadi Pelled, Nadav Kimelman, Yoram Zilberman, Gregory Helm, J Li, **Dan Gazit**, Non Union Bone Defect Regeneration using In Vivo Electroporation-Based Gene Delivery, 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, Nevada, 2009.
6. Zulma Gazit, Ayelet Ben Arav, Coleen Hock, David G Reynolds, Gadi Pelled, Yoram Zilberman, Edward M. Schwarz, **Gazit D.** Craniofacial Bone Tissue Regeneration using rAAV-BMP2-Coated Calvarial Allografts. 12th Annual Meeting of the American Society of Gene Therapy, 2009, San Diego, CA.
7. Zulma Gazit, Yair Steinhardt, Ayelet Ben Arav, Yoram Zilberman, Andrea Hoffmann, Gerhard Gross, Gadi Pelled, **Dan Gazit.** In Vivo Tenocytic

- Differentiation of Primary Mesenchymal Stem Cells by Gene Delivery of Smad8. 12th Annual Meeting of the American Society of Gene Therapy, 2009, San Diego, CA.
8. Ayelet Ben Arav, Jess G Snedeker, Yoram Zilberman, Zulma Gazit, Ralph Müller R, Gadi Pelled, **Dan Gazit**. Smad8/BMP-2 Engineered Mesenchymal Stem Cells Induce Rapid Achilles Tendon Full Defect Regeneration. 12th Annual Meeting of the American Society of Gene Therapy, 2009, San Diego, CA.
 9. Gadi Pelled, Nadav Kimelman- Bleich, Yoram Zilberman, J Li, Gregory A Helm, **Dan Gazit**. In Vivo Electroporation of BMP-9 Gene Induces Bone Regeneration and Non-Union Fracture Repair. 12th Annual Meeting of the American Society of Gene Therapy, 2009, San Diego, CA.
 10. Zulma Gazit, Nadav Kimelman- Bleich, Gadi Pelled, Yoram Zilberman, Carmen Prada, David L Kaplan, **Dan Gazit**. Synthetic Oxygen Carriers Enhance Stem Cell-Based Spinal Fusion and Bone Defect Regeneration. 12th Annual Meeting of the American Society of Gene Therapy, 2009, San Diego, CA.
 11. Gadi Pelled, Yoram Zilberman, Galit Saar, Nadav Kimelman-Bleich, Hadassah Shinar, Keren Keinan-Adamsky, David Kaplan, Carmen Prada, **Dan Gazit**, Gil Navon. In Vivo and Ex Vivo Micro MRI Analysis of Native and Stem Cell-Based Engineered Annulus Fibrosus. World Molecular Imaging Congress 2009, Montreal, Canada.
 12. Gadi Pelled, Ayelet Ben Arav, Wafa Tawackoli, Zulma Gazit, Edward M. Schwarz, **Dan Gazit**. Bioluminescence and Micro CT imaging for Quantifying Bone Tissue Regeneration using rAAV-BMP2-Coated Calvarial Allografts. World Molecular Imaging Congress 2009, Montreal, Canada.
 13. Gadi Pelled, Nadav Kimelman-Bleich, Olga Mizrahi, Yoram Zilberman, **Dan Gazit**. In Vivo Monitoring of Electroporation - Based Non-Union Fracture Repair using Bioluminescence and Micro CT Imaging. World Molecular Imaging Congress 2009, Montreal, Canada.
 14. Gadi Pelled, Nadav Kimelman-Bleich, Yoram Zilberman, Wafa Tawackoli, Zulma Gazit, **Dan Gazit**. Bioluminescence, Transgenic Reporter Mice, Fibered Confocal Microscopy and Micro CT Imaging Demonstrate the Effect of Synthetic Oxygen Carriers on Stem Cell-Based Bone Regeneration. World Molecular Imaging Congress 2009, Montreal, Canada.
 15. **Dan Gazit**, Edward M Schwarz. New Horizon Workshop 6: Imaging Stem Cell Fate and Function, 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, 2010.
 16. Zulma Gazit, Dima Sheyn, Shimon Benjamin, Ilan Kallai, Yoram Zilberman, Gadi Pelled, **Dan Gazit**. Synthetic oxygen carriers downregulate hypoxia-related gene expression leading to enhanced MSC osteogenesis, 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, 2010.
 17. Gadi Pelled, Jess Snedeker, Ayelet Ben-Arav, Yoram Zilberman, Zulma Gazit, Samuela Rigozzi, Ralph Müller, **Dan Gazit**. Stem Cell-Based Tissue Regeneration

- Induces Accelerated Recovery of Tendon Biomechanical Properties, 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, 2010.
18. Gadi Pelled, Ilan Kallai, Davide Ruffoni, Yoram Zilberman, Harry Van Lenthe, **Dan Gazit**. Stem Cell-Mediated Regenerated Bone Remodels and Regains Biomechanical Competence Based on Micro Finite Element Analysis, 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, 2010.
 19. Ilan Kallai, Dima Sheyn, Yoram Zilberman, Wafa Tawackoli, Amir Lavi, Susan Su, Anthony Oh, Xiaoyu Da, Zulma Gazit, Gadi Pelled, **Dan Gazit**. Stem Cell Therapy for Vertebral Bone Tissue Engineering. The TERMIS North America 2010 Annual Conference, Orlando, Florida.
 20. Gadi Pelled, Wafa Tawackoli, Dima Sheyn, Olga Mizrahi, Nadav Kimelman-Bleich, Yoram Zilberman, Susan Su, Anthony Oh, Xiaoyu Da, Yifang Zhou, Rex Moats, Gevorg Karapetyan, Uzi Eliav, Gil Navon, Zulma Gazit, **Dan Gazit**. Stem Cell Fate and Function Monitored By Multimodal Functional Molecular Imaging. The TERMIS North America 2010 Annual Conference, Orlando, Florida.
 21. Olga Mizrahi, Dima Sheyn, Anthony Oh, Wafa Tawackoli, Li Zhao, Hyun Bae, **Dan Gazit**, Zulma Gazit. Regenerative Properties of Degenerated Nucleus Pulposus-Derived Stem Cells. The TERMIS North America 2010 Annual Conference, Orlando, Florida.
 22. Michal Gabay, Wafa Tawacoli, Xiaoyu Da, Anthony Oh, Gadi Pelled, Zulma Gazit, **Dan Gazit**. Functional Optical Imaging Monitoring Angiogenesis and Osteogenesis in Calvarial Repair. The TERMIS North America 2010 Annual Conference, Orlando, Florida.
 23. Gadi Pelled, Wafa Tawackoli, Dima Sheyn, Olga Mizrahi, Nadav Kimelman-Bleich, Yoram Zilberman, Susan Su, Anthony Oh, Xiaoyu Da, Yifang Zhou, Moats Rex, Gevorg Karapetyan, Uzi Eliav, Gil Navon, Zulma Gazit, **Dan Gazit**. Tracking Differentiating Stem Cells In Vivo Using Multimodal Functional Molecular Imaging. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 24. Ashley Allen, Robert G Matheny, **Dan Gazit**, Zulma Gazit, Susan Su, Hazel Y Stevens, Robert E Guldborg. Synthetic vs. Natural Membranes for Cell-Based Bone Tissue Engineering. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 25. Nadav Kimelman-Bleich, Dima Sheyn, Ilan Kallai, Dvir Netaneli, Eytan Domany, Dror Seliktar, Zulma Gazit, **Dan Gazit**, Gadi Pelled. Ex Vivo Dynamic Mechanical Loading and Micro Gravity Alter Stem Cell Differentiation Pathways. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 26. Wafa Tawackoli, Michal Gabay, Xiaoyu Da, Anthony Oh, Gadi Pelled, Zulma Gazit, **Dan Gazit**. Noninvasive Quantitative Functional Optical Imaging of Calvarial Defect Repair: Monitoring of Osteogenesis and Angiogenesis. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 27. Olga Mizrahi, Dima Sheyn, Anthony Oh, Wafa Tawackoli, Li Zhao, Hyun Bae, **Dan**

- Gazit, Zulma Gazit.** Effect of Intervertebral Disc Degeneration on Nucleus Pulposus-Derived Stem Cells. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
28. Zulma Gazit, Amir Lavi, Dima Sheyn, Anthony Oh, Gadi Pelled, Wafa Tawackoli, **Dan Gazit.** Novel Population of Stem Cells Derived From The Temporomandibular Joint Disc. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 29. Dima Sheyn, Yoram Zilberman, Wafa Tawackoli, Ilan Kallai, Amir Lavi, Susan Su, Anthony Oh, Xiaoyu Da, Zulma Gazit, Gadi Pelled, **Dan Gazit.** Stem Cell Therapy for Vertebral Bone Injury. 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, California, 2011.
 30. Dmitriy Sheyn, Ilan Kallai, Wafa Tawackoli, Yoram Zilberman, Amir Lavi, Susan Su, Anthony Oh, Xiaoyu Da, Zulma Gazit, Gadi Pelled, **Dan Gazit.** Gene-and-Stem Cell Therapy for Vertebral Bone Fracture. American Society of Gene & Cell Therapy, 14th Annual Meeting, Toronto, Canada, 2011.
 31. Dmitriy Sheyn, Shimon Benjamin, Shiran Ben David, Ilan Kallai, Yoram Zilberman, Anthony Oh, Gadi Pelled, **Dan Gazit,** Zulma Gazit. Enhanced Cell Survival, Differentiation and Down-Regulation of Hypoxia-Related Genes by Increased Oxygen Supply. American Society of Gene & Cell Therapy, 14th Annual Meeting, Toronto, Canada, 2011.
 32. Nadav Kimelman-Bleich, Gadi Pelled, Wafa Tawackoli, Dmitriy Sheyn, Olga Mizrahi, Yoram Zilberman, Ilan Kallai, Lior Ben Assaf, Susan Su, Anthony Oh, Xiaoyu Da, Gevorg Karapetyan, Rex Moats, Uzi Eliav, Gil Navon, Zulma Gazit, **Dan Gazit.** In Vivo Stem Cell Tracking using Multimodality Molecular Imaging. 6th European Molecular Imaging Meeting, Leiden, The Netherlands, 2011.
 33. Ilan Kallai, Nadav Kimelman-Bleich, Wafa Tawackoli, Xiaoyu Da, Anthony Oh, Gadi Pelled, Zulma Gazit, **Dan Gazit.** Novel Functional Optical Imaging of Craniofacial Bone Defect Repair. 6th European Molecular Imaging Meeting, Leiden, The Netherlands, 2011.
 34. Gadi Pelled, Dmitriy Sheyn, Ilan Kallai, Wafa Tawackoli, Yoram Zilberman, Amir Lavi, Susan Su, Anthony Oh, Xiaoyu Da, Zulma Gazit, **Dan Gazit.** Molecular Imaging of Stem Cell-Mediated Therapy for Vertebral Compression Fractures. 6th European Molecular Imaging Meeting, Leiden, The Netherlands, 2011.
 35. Ilan Kallai, Dmitriy Sheyn, Doron Cohn Yakubovich, Shabtai Or, Wafa Tawackoli, Susan Su, Anthony Oh, Gadi Pelled, Edward M. Schwarz, Zulma Gazit, **Dan Gazit.** Novel Functional Fluorescent Imaging of PTH-Allograft Combined Therapy for Bone Repair. World Molecular Imaging Congress, San Diego, California, 2011.
 36. Gadi Pelled, Wafa Tawackoli, Dmitriy Sheyn, Olga Mizrahi, Nadav Kimelman-Bleich, Yoram Zilberman, Ilan Kallai, Lior Ben-Assaf, Susan Su, Anthony Oh, Xiaoyu Da, Uzi Eliav, Gil Navon, Zulma Gazit, **Dan Gazit.** Optical, Nuclear and Magnetic Resonance Imaging for Monitoring Mesenchymal Stem Cell Fate in Skeletal Regeneration. World Molecular Imaging Congress, San Diego, California, 2011.

37. Dmitriy Sheyn, Ilan Kallai, Wafa Tawackoli, Doron Cohn, Yakubovich, Anthony Oh, Susan Su, Xiaoyu Da, Amir Lavi, Nadav Kimelman-Bleich, Yoram Zilberman, Ning Li, Hyun Bae, Zulma Gazit, Gadi Pelled, **Dan Gazit**. Functional MicroCT and Bioluminescence Imaging Advance Novel Stem Cell Therapy for Vertebral Compression Fractures. World Molecular Imaging Congress, San Diego, California, 2011.
38. Olga Mizrahi, Dima Sheyn, Anthony Oh, Wafa Tawackoli, Li Zhao, Hyun Bae, **Dan Gazit**, Zulma Gazit. IVD Degeneration Affects Nucleus Pulposus-Derived Stem Cells in A Large Animal Model. North American Spine Society's 26th Annual Meeting, Chicago, Illinois, 2011.
39. Dmitriy Sheyn, Olga Mizrahi, Wafa Tawackoli, Anthony Oh, Gadi Pelled, Nadav Kimelman-Bleich, **Dan Gazit**, Zulma Gazit. Adipose-derived Stem Cells Expressing BMP-6, not BMP-2, Effectively Promote Vertebral Defect Regeneration. 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, California, 2012.
40. Gadi Pelled, Ilan Kallai, Dmitriy Sheyn, Doron Cohn Yakubovich, Shabtai Or, Susan Su, Anthony Oh, Wafa Tawackoli, Edward M. Schwarz, Zulma Gazit, **Dan Gazit**. PTH effects on Calvaria Bone Allograft Healing Process Monitored by In-Vivo Functional Fluorescence Imaging. 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, California, 2012.
41. Ilan Kallai, Olga Mizrahi, Dmitriy Sheyn, Gadi Pelled, **Dan Gazit**, Zulma Gazit. BMP-6 is More Efficient in Bone Formation Than BMP-2 When Overexpressed in Mesenchymal Stem Cells. The Israel Stem Cell Society Meeting for Young Scientists, Tel Aviv, Israel, 2012.
42. Doron Yakubovich, Ilan Kallai, Galina Shapiro, Gadi Pelled, **Dan Gazit**, Zulma Gazit. PTH Treatment Enhances Mesenchymal Stem Cell Differentiation, Improving Healing Process of Calvarial Bone Allografts. The Israel Stem Cell Society Meeting for Young Scientists, Tel Aviv, Israel, 2012.
43. Galina Shapiro, Olga Mizrahi, Dmitriy Sheyn, **Dan Gazit**, Zulma Gazit. Nucleus Pulposus Degeneration Alters Properties of Resident Progenitor Cells. The Israel Stem Cell Society Meeting for Young Scientists, Tel Aviv, Israel, 2012.
44. Ilan Kallai, Shimon Benjamin, Dmitriy Sheyn, **Dan Gazit**, Zulma Gazit. Oxygenated Environment Enhances Both, Stem Cell Survival and Osteogenic Differentiation. The Israel Stem Cell Society Meeting for Young Scientists, Tel Aviv, Israel, 2012.
45. Yosi Navaro, Nadav Kimelman-Bleich, Gadi Pelled, Zulma Gazit, **Dan Gazit**. The Effect of Matrix Elasticity on Nucleus Pulposus Stem Cells. The Israel Stem Cell Society Meeting for Young Scientists, Tel Aviv, Israel, 2012.
46. Dmitriy Sheyn, Hyun W. Bae, Anthony Oh, Wafa Tawackoli, **Dan Gazit**, Zulma Gazit. Resident Stem Cells of the Nucleus Pulposus Are Affected by Tissue Degeneration. 27th Annual Meeting of the North American Spine Society, Dallas, Texas, 2012.

47. Amir Lavi, Olga Mizrahi, Dmitriy Sheyn, Anthony Oh, Nardy Casap, **Dan Gazit**, Zulma Gazit. Mesenchymal Stem Cells Isolation and Characterization from Temporomandibular Joint Disc. Annual Meeting of the International Association for Dental Research, Helsinki, Finland, 2012.
48. Gadi Pelled, Zulma Gazit, **Dan Gazit**. Stem Cells for Skeletal regeneration. 12th Annual Symposium on Current Concepts in Spinal Disorders, Las Vegas, NV, 2013.
49. Qi Liu, Zhaoyang Fan, Yutaka Natsuaki, Ning Jin, Wafa Tawackoli, Gadi Pelled, **Dan Gazit**, Debiao Li. Chemical Exchange and In Vivo Intervertebral Disc R1-Rho Dispersion Imaging: A Feasibility Study. The International Society for Magnetic Resonance in Medicine 21st Annual Meeting, Salt Lake City, Utah, 2013.
50. Qi Liu, Ning Jin, Zhaoyang Fan, Yutaka Natsuaki, Wafa Tawackoli, **Dan Gazit**, Gadi Pelled, Debiao Li. Intervertebral Disc CEST Imaging with Improved Reliability Using Reduced-FOV TSE. The International Society for Magnetic Resonance in Medicine 21st Annual Meeting, Salt Lake City, Utah, 2013.
51. PTH Treatment Enhances Endogenous Mesenchymal Stem Cell Differentiation, Improving The Integration Of Calvarial Bone Allografts. Tawackoli W, Sheyn D, Su S, Da X, Cook-Weis G, Pelled G, Schwarz E.M., **Gazit D**, Gazit Z. Cell Symposia: Using Stem Cells to Model and Treat Human Disease. Cedars-Sinai Medical Center, Los Angeles, CA, 2013.
52. Therapeutic Gene Targeting To Endogenous Stem Cells For Bone Regeneration. Pelled G, Sheyn D, Tawackoli W, Su S, Gazit Z, Koh Y.D., Bae H, **Gazit D**. Cedars-Sinai Medical Center, Los Angeles, CA, 2013.
53. Isolation And Characterization Of A Novel Mesenchymal Stem Cell (MSC) Population From The Temporomandibular Joint (TMJ) disc. Sheyn D, Su S, W. Tawackoli, Pelled G, **Gazit D**, Gazit Z. Cedars-Sinai Medical Center, Los Angeles, CA, 2013.
54. Combined Systemic Mesenchymal Stem Cell (MSC) And PTH Therapy For Osteoporosis-Related Lumbar Fractures. Sheyn D, Tawackoli W, Jun D.S., Koh Y.D., Bae H, Da X, Su S, Gazit Z, Pelled G, **Gazit D**. Cedars-Sinai Medical Center, Los Angeles, CA, 2013.
55. Allogeneic, BMP6 Gene-Modified, Bone Marrow MSCs Induce Vertebral Fracture Repair in a Porcine Model: A Pilot Study. Sheyn D, Tawackoli W, Gazit Z, Pelled G, Bae H.W., **Gazit D**. North American Spine Society 28th Annual Meeting, New Orleans, LA, 2013.
56. PTH Effects on Bone Healing in Calvaria Bone Allograft Model. Cohn-Yakubovich D, Sheyn D, Kallai I, Su S, Da X, Pelled G, Tawackoli W, Schwarz E.M., **Gazit D**, Gazit Z. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.
57. PTH Effects Bone Healing and Vasculogenesis in Calvaria Bone Allograft Model. Sheyn D, Cohn-Yakubovich D, Kallai I, Su S, Da X, Pelled G, Tawackoli W, Schwarz E.M., **Gazit D**, Gazit Z. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.

58. A Novel pH-Dependent Magnetic Resonance Imaging (MRI) Method for the Non-Invasive Detection of Discogenic Pain. Pelled G, Liu Q, Tawackoli W, Fan Z, Jin N, Natsuaki Y, Bi X, Gart A, Bae H, Li D, **Gazit D**. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.
59. The Effect Of Matrix Elasticity On Nucleus Pulposus Stem Cells. Pelled G, Navaro Y, **Gazit D**, Seliktar D, Gazit Z. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.
60. Therapeutic Gene Targeting To Endogenous Stem Cells For Bone Regeneration. Shapiro G, Kallai I, Sheyn D, Tawackoli W, Gazit Z, Bae H, Pelled G, **Gazit D**. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.
61. Effective Systemic and Local Mesenchymal Stem Cell Therapies for Vertebral Compression Fractures. Sheyn D, Tawackoli W, Kallai I, Cohn-Yakubovich D, Shapiro G, Da X, Jun D.S., Koh Y.D., Gazit Z, Pelled G, Bae H, Gazit D. Orthopaedic Research Society (ORS) 60th Annual Meeting, New Orleans, LA, 2014.
62. A Combined Treatment of Gene-Modified Stem Cells and Oxygenated Scaffolds for Scaphoid Nonunion with Avascular Necrosis. Tawackoli W, Cohn Yakubovich D, Kulber D, **Gazit D**, Gazit Z. Orthopaedic Research Society (ORS) 61st Annual Meeting, Las Vegas, CA, 2015.
63. Effective Systemic Mesenchymal Stem Cell Therapy for Vertebral Compression Fractures. Sheyn D, Tawackoli W, Shapiro G, Soo Jun D, Doo Koh Y, Su S, Bez M, Sharfman Z, Gazit Z, Pelled G, Bae HW, **Gazit D**. Orthopaedic Research Society (ORS) 61st Annual Meeting, Las Vegas, CA, 2015.
64. IPS Cells Can Be Efficiently Differentiated Back To MSCs Using A Short Exposure To TGF β . Sheyn D, Ben-David D, De Mel SA, Ornelas L, Sahabian A, Sareen D, Da X, Tawackoli W, **Gazit D**, Gazit Z. Orthopaedic Research Society (ORS) 61st Annual Meeting, Las Vegas, CA, 2015.

GRANTS (LAST THREE YEARS)

CIRM TR4-06713 (PI: Gazit)

12/1/13 – 11/30/16

“Gene Targeting to Endogenous Stem Cells for Segmental Bone Fracture Healing”

The objective of the project is to develop a new therapeutic modality for segmental fracture repair consisting of ultrasound-mediated gene targeting to endogenous MSCs.

NIH/NIDCR R01DE19902 (MPI: Schwarz, Gazit)

7/1/09 – 6/30/15 in no cost extension

“PTH Effects on Craniofacial Allografting”

The goal of the proposal is to define the effects of PTH on bone healing using allografts with specific emphasis on scar tissue formation and inflammation.

NIH/NIAMS R01AR066517-01 (MPI: Li, Gazit)

6/1/14- 5/31/18

“Diagnosis of Discogenic Low Back Pain Using pH Level-Dependent MRI”

Purpose: Develop and establish an MRI method to diagnose the origin of discogenic low back pain.

CIRM TR2-01780 (PI: Gazit)

3/1/11- 2/28/14

“Systemic Adult Stem Cell Therapy for Osteoporosis-Related Vertebral Compression Fractures”.

The goals of the project are to develop a stem cell-based therapy for osteoporotic vertebral fractures. Our hypothesis is that that PTH will induce MSC homing to the bone defects leading to accelerated bone repair.

CIRM RT2-02057 (PI: Zhang; Sub contract PI: Gazit)

10/1/11- 30/09/14

“Tri-Resolution Visualization System for Stem Cells and Tissue Regeneration Monitoring”

The goal of this project is to develop a SPECT-MR imaging system with triple resolution capabilities for stem cell tracking in vivo.

PUBLICATIONS

Ph.D. Thesis (1991): Osteogenic regulatory mechanisms: Growth factor profile and systemic enhancement of bone formation during the osteogenic phase of marrow regeneration.

D.M.D. Thesis (1976): The effect of cis-hydroxiprolin on growth and eruption of the rat incisor.

Scientific Articles

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2. **Gazit, D.**, Ulmansky, M., Fischman, S., Bab, I. and Sela, J. A study of a sample of oral cancer in Israel. *Oral Surg, Oral Medicine, Oral Pathology.* 1984; 57:118-121.
3. Hirschfeld, Z., **Gazit, D.**, Bab, I., Ulmansky, M. and Sela, J. Comparative study of the effect of calcium hydroxide and demineralized bone matrix on subcutaneous tissue in the rat. *Isr. J. Dent. Sci.* 1984; 1:71-76.
4. Kischinovsky, D., **Gazit, D.**, and Azaz, B. Multifocal cystic hygroma. *Am. J. Child. Dent.* 1984; 51:444-447.

5. Zalkind, M., Bab, I., **Gazit, D.**, Sela, J. and Ulmansky, M. The reaction of rat molar pulp to direct application of a glass-ionomer cement. *Isr. J. Dent. Sci.* 1984; 1:67-70.
6. Bab, I., **Gazit, D.**, Massarawa, A. and Sela, J. Removal of tibial marrow induces increased formation of bone and cartilage in rat mandibular condyle. *Calcif. Tissue Int.* 1985; 37:551-555.
7. *Bab, I., **Gazit, D.**, Massarawa, A., Ulmansky, M. and Sela, J. Enhancement of cartilage and bone formation in the mandibular condyle following ablation of rat tibial marrow. In: *Current Advances in Skeletogenesis: Induction, Biomineralization, Bone seeking Hormones, Congenital and Metabolic Bone Diseases.* (Ornoy A, Harel A, Sela J., Eds). Excerpta Medica, Amsterdam: Elsevier Science Publishers, 1985; pp33-37.
8. Bab, I., Lustman, Y., Azaz, B., **Gazit, D.** and Garfunkel, A. Calcification of non-collagenous matrix in human gingiva: a light and electron microscopic study. *J. Oral Pathol.* 1985; 14:573-580.
9. ***Gazit, D.**, Ulmansky, M., Bab, I. and Sela, J. Reaction of bone to a metastasis of poorly differentiated carcinoma. In: *Current Advances in Skeletogenesis: Induction, Biomineralization, Bone Seeking Hormones, Congenital and Metabolic Bone Diseases* (Ornoy, A., Harel, A. and Sela, J., ed.s) Excerpta Medica, Amsterdam: Elsevier Science Publishers, 1985; pp311-314.
10. Nitzan, DW., **Gazit, D.** and Azaz, B. Childhood odontogenic myxoma. *Pediatric Dentistry.* 1985; 7:140-144.
11. Bab, I., Ashton, B.A., **Gazit, D.**, Marx, G., Williamson, M.C. and Owen, M.E. Kinetics and differentiation of marrow stromal cells in diffusion chambers in vivo. *J. Cell Science* 1986; 84:139-151.
12. ***Gazit, D.**, Shteyer, A. and Bab, I. Marrow derived factors regulating bone cell proliferation and activity. In: *Current advances in Skeletogenesis III* (Hurwitz, S. and Sela, J., eds.) Jerusalem: Heiliger Publ. Co. 1986; pp272-277.
13. Lustman, J., **Gazit, D.**, Ulmansky, M. and Lewin-Epstein, J. Chondromyxoid fibroma of the jaws: a clinicopathological study. *J. Oral Pathol.* 1986; 15:343-346.
14. Margulis, J.Y., Leichter, I., Robin, G.C., **Gazit, D.** and Bab, I. A correlative assessment of photon interaction and histomorphometric measurements of bone density. *Arch. Orthop. Trauma. Surg.* 1986; 105:239-242.
15. Milgrome, C., Sigal, R., Robin, C. G., **Gazit, D.**, Fields S., Benmair, J., Caine Y. and Atlan, H. MRI and CT scan compared with microscopic histopathology in osteogenic sarcoma of the proximal tibia. *Orthop. Rev.* 1986; 15(3):165-169.

16. Peled, I. J., Wexler, M.R., Bab, I., **Gazit, D.**, Bab, I., Shoshan, S., Moshe, SB. and Ticher, S. Capsule around silicone implants in diabetic rats: a histological and biochemical study. *Ann. Plas. Surg.* 1986; 17:288-291.
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18. Shteyer, A., **Gazit D.**, Passi-Even, L., Bab, I., Majeska, R., Goronowicz, A., Lurie, A. and Rodan, G. Formation of calcifying matrix by osteosarcoma cells in diffusion chambers in vivo. *Calcif. Tissue Int.* 1986; 39:49-54.
19. *Bab, I., **Gazit D.**, Binderman, I. and Shteyer, A. Studies in human dental papilla cells: Production of collagenous matrix in vivo in diffusion chambers; In vitro effect of calcitonin, parathyroid hormone and prostaglandin E2. In: *Current Advances in Skeletogenesis III* (Hurwitz, S. and Sela J., ed.s) Jerusalem: Heiliger Publ. Co., 1987; pp67-72.
20. *Foldes, J., Leichter, I., **Gazit, D.**, Steinberg, R., Menczel, J. and Bab, I. In vivo measurements of bone density by Compton spectroscopy and histomorphometry in postmenopausal osteoporosis. In: "Osteoporosis 1987" (Christiansen, C., Johansen, J.S. and Riis, R.J. eds.) Aalborg. 1987; pp971-973.
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*Included as a chapter in a book

Patents

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6. Systems and Methods for Analyzing and Manipulating Biological Samples. **Gazit D**, Rubinsky B, Pelled G, Gazit Z. US patent 7,951,582.
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