

## PERSONAL DETAILS

Izhak Kehat

## ACADEMIC DEGREES

- 2005            Doctor of Philosophy  
                  Department of Physiology, Faculty of Medicine.  
                  Technion- Israel institute of technology.
- 1997            Doctor of Medicine  
                  Faculty of Medicine. Technion- Israel Institute of  
                  technology.
- 1992            Bachelor of Science in Medical Sciences  
                  Faculty of Medicine. Technion- Israel Institute of  
                  technology.

## ACADEMIC APPOINTMENTS

- 2007-2010    Post doctoral fellow. Jeffery D. Molkenin Lab. Howard Hughes  
                  Medical Institute. Cincinnati Children's hospital Medical Center
- 2006            Clinical Lecturer, Technion-Israel Institute of Technology
- 2006            Teaching Assistant, Department of Physiology and Cell  
                  Biophysics, Technion-Israel Institute of Technology
- 2001-2002    Teaching Assistant, Department of Physiology and Cell  
                  Biophysics, Technion-Israel Institute of Technology
- 1990-1991    Teaching Assistant, Department of Anatomy, Technion-Israel  
                  Institute of Technology

## **PROFESSIONAL EXPERIENCE**

2006-2007	Fellow, Department of Cardiology, Rambam Medical Center
2002-2006	Residency in Internal Medicine, Department of Internal Medicine, Rambam Medical Center
1998-2000	Diving Medical Officer, Israeli Naval Medical Institute, IDF
1996-1998	Brigade Medical Officer, IDF
1997	ECFMG Certified

## **RESEARCH INTERESTS**

Signaling in myocardial hypertrophy  
Human embryonic stem cell derived cardiomyocytes  
Atrial hypertrophy and dilatation  
Diving and hyperbaric medicine

## **TEACHING EXPERIENCE**

Lecturer. Physiology for Engineers, Dept. for Bioengineering, Technion  
Teaching Assistant, Anatomy for Medical Students (undergraduate)  
Teaching Assistant, Cardiovascular Physiology for Medical Students (undergraduate)  
Teaching Assistant, Biophysics for Medical Students (undergraduate)  
Lecturer, Diving Medicine Course (graduate)  
Lecturer, Cardiovascular Physiology for Intensive Care Nursing (graduate)

## **HONORS**

- 2006 Human Frontier Science Program Long term Fellowship
- 2005 J.J. Kelerman Young Investigator Award, Israel Heart Society
- 2005 The Rena Yarom Young Investigator Award for Cardiovascular Research. Israeli group for heart research, subsection of the International Society for Heart Research (ISHR)- European section
- 2004 The European Lecture. The 70th Annual meeting of the German Society of Cardiology--Heart and Circulatory Research.
- 2004 Rambam Medical Center- Best Research Work -1<sup>st</sup> Prize.
- 2003 Complexity Science foundation scholarship
- 2002 American Heart Association - trainee abstract award
- 2002 Wolf Foundation Award for Research Students
- 2002 Henry Neufeld Research Award for Original Work, Israel Heart Society
- 2001 American Heart Association - trainee abstract award
- 2001 Rambam Medical Center- Best Research Work -1<sup>st</sup> Prize.
- 2001 The Rena Yarom Young Investigator Award for Cardiovascular Research. Israeli group for heart research, subsection of the International Society for Heart Research (ISHR)- European section
- 1997 Best Intern award, Carmel Hospital, Haifa, Israel.
- 1997 Doctor of Medicine, Summa Cum Laude. Technion-Israel Institute of Technology.
- 1996 M.D. Dissertation - commended for excellence with special distinction.
- 1993 Scholarship for elective in medicine, at the University of Illinois.
- 1992 President's list for scholastic excellence, Technion-Israel Institute of Technology.
- 1992 Bachelor of Science in Medical Sciences, Summa Cum Laude.
- 1991 President's list for scholastic excellence, Technion-Israel Institute of Technology.
- 1990 President's list for scholastic excellence, Technion-Israel Institute of Technology.

1989 President's list for scholastic excellence, Technion-Israel Institute of Technology.

### **PUBLIC PROFESSIONAL ACTIVITIES**

Ad hoc Reviewer – Cardiovascular Research Journal

Ad hoc Reviewer – British Journal of Pharmacology

Ad hoc Reviewer- Journal of American College of Cardiology

Ad hoc Reviewer – Thrombosis and Hemostasis

Grant application Reviewer - Israel Academy of Sciences and Humanities Foundation (ISF)

### **MEMBERSHIP IN PROFESSIONAL SOCIETIES**

-AMERICAN HEART ASSOCIATION

-Israeli group for heart research, subsection of the International Society for Heart Research (ISHR)- European section

### **PUBLICATIONS**

#### **Theses**

**M.D. dissertation:** The physiological role of voltage and time dependant potassium conductance in the outer layer of the turtle retina. Commended for excellence with special distinction. Technion-Israel Institute of technology.  
Supervisor: Prof. I. Perlman

**Ph.D. Thesis:** Electromechanical Assessment of Embryonic, Fetal and Adult Cardiomyocyte Cultures: Possible Role in the Regeneration of Functional Myocardium. Technion-Israel Institute of technology.  
Supervisor: Prof. L. Gepstein

## Refereed papers in professional journals:

### - Basic research

1. Tsika RW, Ma L, **Kehat I**, Schramm C, Simmer G, Morgan B, Fine DM, Hanft LM, McDonald KS, Molkenstin JD, Krenz M, Yang S, Ji J. Tead-1 over-expression in the mouse heart promotes an age-dependent heart dysfunction.  
*J Biol Chem* 2010 Mar 1.
2. Caspi O, Itzhaki I, Arbel G, **Kehat I**, Gepstien A, Huber I, Satin J, Gepstein L. In Vitro Electrophysiological Drug Testing using Human Embryonic Stem Cell Derived Cardiomyocytes.  
*Stem Cells Dev.* 2008 May 29
3. Caspi O, Huber I, **Kehat I**, Habib M, Arbel G, Gepstein A, Yankelson L, Aronson D, Beyar R, Gepstein L. Transplantation of human embryonic stem cell-derived cardiomyocytes improves myocardial performance in infarcted rat hearts.  
*J Am Coll Cardiol.* 2007 Nov 6; 50(19):1884-93
4. Huber I, Itzhaki I, Caspi O, Arbel G, Tzukerman M, Gepstein A, Habib M, Yankelson L, **Kehat I**, Gepstein L. Identification and selection of cardiomyocytes during human embryonic stem cell differentiation.  
*Faseb J* 2007 Apr 13
5. **Kehat I**, Heinrich R, Ben-Izhak, O, Miyazaki H, Gutkind SJ, and Aronheim A. Inhibition of basic leucine zipper transcription is a major mediator of atrial dilatation.  
*Cardiovasc Res* 2006 Jun 1;70(3):543-54
6. **Kehat I**, Khimovich L, Caspi O, Gepstein A, Shofti R, Arbel G, Huber I, Satin J, Itskovitz-Eldor J, Gepstein L. Electromechanical integration of cardiomyocytes derived from human embryonic stem cells.  
*Nat Biotechnol.* 2004 Sep 26

7. Satin J, **Kehat I**, Caspi O, Huber I, Arbel G, Itzhaki I, Magyar J, Schroder EA, Perlman I, Gepstein L. Mechanism of spontaneous excitability in human embryonic stem cell derived cardiomyocytes. *J Physiol*. 2004 Sep 1;559(Pt 2):479-96.
8. **Kehat I**, Amit M, Gepstein A, Itskovitz-eldor, J, Gepstein L. Development of cardiomyocytes from human ES cells. *Methods Enzymol* 365:461-73; 2003
9. Snir M, **Kehat I**, Gepstein A, Coleman R, Itskovitz-Eldor J, Livne E, Gepstein L. Assessment of the Ultrastructural and Proliferative Properties of Human Embryonic Stem Cell-Derived Cardiomyocytes. *Am J Physiol Heart Circ Physiol*. 285(6):H2355-63; 2003
10. **Kehat I**, Gepstein A, Spira A, Itskovitz-Eldor J, Gepstein L. High-resolution electrophysiological assessment of human embryonic stem cell-derived cardiomyocytes: a novel in vitro model for the study of conduction. *Circ Res* 91(8):659-61; 2002.
11. Kol S, **Kehat I**, Adashi EY. Ovarian Interleukin-1 induced gene expression: privileged genes threshold theory. *Med Hypotheses* 58(1):6-8, 2002
12. Feld, Y., Melamed-Frank, M., **Kehat, I.**, Tal, D., Marom, M., Gepstein, L. Electrophysiological Modulation of Cardiomyocytic Tissue by Transfected Fibroblasts Expressing Potassium Channels: A Novel Strategy to Manipulate Excitability. *Circulation* 29;105(4):522-9, 2002
13. **Kehat I**, Kenyagin-Karsenti D, Snir M, Segev H, Amit M, Gepstein A, Livne E, Binah O, Itskovitz-Eldor J, Gepstein L. Human embryonic stem cells can differentiate into myocytes with structural and functional properties of cardiomyocytes. *J Clin Invest* 108(3):363-4, 2001
14. Shoshani O, Ullmann Y, Shupak A, Ramon Y, Gilhar A, **Kehat I**, Peled IJ.  
The role of frozen storage in preserving adipose tissue obtained by suction-assisted lipectomy for repeated fat injection procedures. *Dermatol Surg* 27(7):645-7; 2001

15. Shoshani O, Shupak A, Ullmann Y, Ramon Y, Gilhar A, **Kehat I**, and Peled IJ. The effect of hyperbaric oxygenation on the viability of human fat injected into nude mice.  
*Plast Reconstr Surg* 106(6):1390-6; 2000.

- **Clinical Research**

16. **Kehat I**, Shupak A, Goldenberg I, Shoshani O. Long-term hematological effects in Special Forces trainees.  
*Mil Med* 168(2):116-9, 2003.
17. **Kehat I**, Shupak A. Hyperbaric oxygen vs. normobaric oxygen in carbon monoxide intoxication.  
*Undersea Hyperb Med* 27:47, 2000.
18. Shoshani O, Berger J, Fodor L, Ramon Y, Shupak A, **Kehat I**, Gilhar A, Ullmann Y. The effect of lidocaine and adrenaline on the viability of injected adipose tissue--an experimental study in nude mice.  
*J Drugs Dermatol.* 4(3):311-6. 2005

**Review papers**

19. **Kehat I**, Gepstein, L. Human embryonic stem cells for myocardial repair.  
*Heart fail rev* 8,229-236, 20003
20. Lev S, **Kehat I**, Gepstein L. Differentiation pathways in human embryonic stem cell-derived cardiomyocytes.  
*Ann N Y Acad Sci.* 1047:50-65, 2005
21. **Kehat I**, Hasin T, Aronheim A. The role of basic leucine zipper protein-mediated transcription in physiological and pathological myocardial hypertrophy.  
*Ann N Y Acad Sci* 1080:97-109, 2006
22. **Kehat I**, Gepstein L. Electrophysiological coupling of transplanted cardiomyocytes.

*Circ Res.* 2007 Aug 31;101(5):433-5

23. **Kehat I**, Molkentin JD. Extracellular signal-regulated kinase 1/2 (ERK1/2) signaling in cardiac hypertrophy. *Ann N Y Acad Sci.* 2010 Feb;1188:96-102.

## **Patents**

2004 , Derivation and use of human embryonic stem cell derived cardiomyocytes,  
Pending

## **CONFERENCES**

### **Plenary or invited talks**

1. University of Michigan, Kellogg Eye Center, Grand Rounds  
Ann-Arbor, Michigan, USA. November 16, 2000  
Human Embryonic stem cell derived cardiomyocytes.
2. Stem Cells in Future Medicine and Geriatrics Seminar  
Ben-Gurion University  
Beer-Sheba, Israel. March 18, 2002  
Derivation of Cardiomyocytes from human embryonic stem cells.
3. 68<sup>th</sup> German Cardiac society Meeting.  
Manheim, Germany. April 5-7, 2002  
Cardiomyocytes derived from human embryonic stem cells.
4. Leibniz Symposium on Cardiovascular Regeneration  
1<sup>st</sup> Colloquium Center of Competence Cardiovascular Implants  
Hannover, Germany. May 24-25, 2002  
Human embryonic stem cell Derived Cardiomyocytes - implications for research and medicine.
5. Technische Universität, Institut für Pharmakologie und Toxikologie,  
Medizinische Fakultät Carl Gustav Carus.  
Dresden, Germany. May 26, 2002  
Human embryonic stem cell derived cardiomyocytes - implications for research and medicine.

6. Friedrich-Alexander Universitat Erlangen-Nurnberg, Department of Pharmacology.  
Erlangen, Germany. May 28, 2002  
Human Embryonic Stem Cell Derived Cardiomyocytes - Implications For Research and Medicine.
7. Cardiostim 2002. 13<sup>th</sup> international congress.  
Nice, France. June 19-22.  
Human Embryonic Stem Cell Derived Cardiomyocytes for Myocardial Repair.
8. Cardioascona 2003. 4th International Ascona Workshop on Cardiomyocyte Cell Biology. Ascona, Switzerland, April 13-17th 2003  
Human Embryonic Stem Cell Derived Cardiomyocytes.
9. Transcatheter Cardiovascular Therapeutics. Washington DC, USA.  
September 15-19, 2003. Human Embryonic Stem Cell Derived Cardiomyocytes - Implications For Research and Medicine.
10. **The European Lecture.** The 70th Annual meeting of the German Society of Cardiology--Heart and Circulatory Research. April 15-17, 2004, Mannheim, Germany.  
Stem cell therapy in cardiology.
11. Acute Cardiac Care. European Society of Cardiology Working Group.  
Rome, Italy. October 17-20, 2004. Stem Cell Based Therapy.
12. 3rd Fairberg Cardiac Workshop. April, 2005. Portugal.  
Human Embryonic Stem Cell Derived Cardiomyocytes.
13. From Stress to Repair in the Cardiovascular System. King's College London. 27th March 2006.  
London, UK  
Human Embryonic Stem Cell Derived Cardiomyocytes for Cardiac Repair
14. 4<sup>th</sup> Fairberg Cardiac Workshop. 23-27 April, 2006. Charlestone, USA.  
The role of basic leucine zipper protein-mediated transcription in physiological and pathological myocardial hypertrophy
15. **Opening Keynote Address.** 5<sup>th</sup> international meeting on substrate-integrated microelectrode arrays. July 4-7, 2006.  
Reutlingen, Germany.  
Human embryonic stem cell derived cardiomyocytes - in vitro assessment and in vivo applications

16. Winter Meeting on Translational Basic Science of the Heart Failure Association of the European Society of Cardiology . 24-27 January 2007, Garmisch-Partenkirchen Germany.  
Differentiation of human embryonic stem cells.

## **RESEARCH GRANTS**

2007 American Physician Fellowship. Edward H. Kass Medical Research Award. The Role of Basic Leucine Zipper (bZIP) Protein mediated Transcription in Atrial Hypertrophy and Dilatation. 40,000, PI: Izhak Kehat

2006-2007 Israeli Ministry of Health. The role of AP-1 mediated transcription in physiological and pathological myocardial hypertrophy. 80,000, co-PI: Izhak Kehat

2004 Boston-Haifa Collaboration Young Clinical Investigation Research Fund, The role of AP-1 mediated transcription in physiological and pathological myocardial hypertrophy, 10,000, PI: Izhak Kehat