

# Curriculum Vitae

## Azriel Binyamin Osherov, M.D.

Interventional cardiology unit, cardiology department, Barzilai Medical Center, Ashkelon Israel.

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**Date and Place of birth:** 09-14-1967, Nahariya Israel

**Military Service:** 1985- 1988 later on as Physician (Lieutenant)

**Languages:** English (fluent), Hebrew (fluent).

### **EDUCATION:**

- 1999 M.D. Hebrew University, Hadassah University Hospital, Jerusalem Israel.
- 2008 ECFMG certificate: No. 0-588-931-6 Issued by the educational commission for foreign medical graduate USA.
- 1992 B.Sc Biology (with distinction) Hebrew University Givat Ram – Jerusalem.
- 2001 ATLS (Advanced Trauma Life Support) course.
- 1997 ACLS (Advanced Cardiac Life Support) course
- 1999-2002 Internal Medicine Sheba Medical Centre, Tel Hashomer, Israel
- 2003-2005 Cardiology Heart Institute, Sheba Medical Centre, Tel Hashomer, Israel

### **CERTIFICATIONS:**

**License to practice medicine**, Issued by the Division of Medical Professions of the Israel Ministry of Health. No. 31734, 9.Sep.1999

**Internal medicine Specialist**, Israel Ministry of Health, License No. 19835, 17.Dec.2002

**Cardiology Specialist**, Israel Ministry of Health, license No. 22135,  
19.Feb.2006

**ECFMG certificate** March 2008 No. 0-588-931-6

(USMLE step one 3.Dec.2007 score= 99, USMLE step 2 CK 25.June.2007  
score= 97, USMLE step 2 CS 2.May.2008).

### **TRAINING**

**Cardiology Training includes:** 6 months in echocardiography, 6 months in  
invasive cardiology, 4 months in electrophysiology, 2 months in nuclear  
cardiology, 8 months in the cardiac intensive care, 8 months in the step  
down Cardiology Unit, one month in pediatric cardiology, and one month in  
cardiac surgery.

December 2005: Completed successfully board examination in cardiology at  
the Sheba Medical Centre, Tel Hashomer, Israel,

### **FELLOWSHIP PROGRAMS:**

Mar 2007- June 2008: **Clinical fellowship in interventional cardiology**,  
Rambam Medical Centre, Haifa Israel. The fellowship in interventional  
cardiology lasted 15 month. I was the primary operator in 1600 diagnostic  
coronary angiograms and over 400 coronary interventions. Department of  
Cardiology, Rambam Health Care Campus – p.o. box 9602, Tel. 972-4-  
8542180, Haifa 31096 Israel.

July 2008- June 2009: **Clinical fellowship in interventional cardiology**,  
Toronto General Hospital-University Health Network, Toronto, Ontario,  
Canada. Primary operator in over 400 complex coronary interventions.  
(LM stenting, bifurcations, multiple vessel procedures, CTO, using IVUS,  
FFR, Rotablation, Impella support device).

July 2009- June 2010: **Clinical and research fellowship in interventional  
cardiology**, Toronto General Hospital-University Health Network, and

Sunnybrook Health Sciences Centre. Toronto, Ontario, Canada. Primary operator in over 400 complex coronary interventions.

July 2010- June 2011: **Clinical and research fellowship in interventional cardiology**, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada. 700 procedures (400 PCI, 300 angiographies)

July 2011- December 2012: **Clinical and research fellowship in interventional cardiology**, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada.

**Previous positions:**

Jan 2006 - Jan 2007: Staff cardiologist in the Heart Institute – Tel Hashomer. Actively involved in the day to day running of the step down Cardiology Unit, outpatient heart failure clinic in NYHA class III/IV and outpatient general cardiology clinic. (Faculty/Dept: Sackler Faculty of Medicine, Tel Aviv University, Heart Institute, Sheba Medical Centre, Tel Hashomer, Israel)

**Current positions:**

January -2012 – senior interventional cardiologist – Barzilai Medical Centre Ashkelon.

January -2012 - senior cardiologist – Kupat Holim Clalit Heart failure outpatient clinic – Ganey Tikva – Israel largest Heart failure clinic.

**PUBLICATIONS:**

1. **Osherov Azriel**, Goldberg D, Atlas D. Is the neuronal voltage-sensitive calcium channel of human brain, human pancreatic beta cells and rat brain much larger than predicted by its cDNA sequence? *Neurosci Lett.* 1992; 147:233-235.

2. Leiba A, Apter S, Avni I, **Osherov Azriel**, Thaler M, Grossman E. Pyogenic liver abscess--an unusual presentation of colonic villous adenoma. *Harefuah*. 2003; 142:336-7, 399. Hebrew.
3. **Osherov Azriel**, Matetzky S, Beinart R, Hod H. Transient left ventricular apical ballooning (Tako-tsubo): the syndrome that mimics acute myocardial infarction. *Isr Med Assoc J*. 2004; 6:550-552. Review.
4. Elian D, **Osherov Azriel**, Matetzky S, Hod H, Guetta V, Feinberg M, Di Segni E. Left Ventricular Apical Ballooning: Not An Uncommon Variant Of Acute Myocardial Infarction In Women . *Clinical cardiology* 2006; 29:9-12
5. **Osherov Azriel**. Schwammenthal E, Kuperstein R, Strahilevitz J, Feinberg M. Phialemonium Curvatum Prosthetic Valve Endocarditis with an Unusual Echocardiographic Presentation. *Echocardiography*. 2006; 23:503-505
6. **Azriel B. Osherov**, Michal Borovik-Raz , Doron Aronson, Yoram Agmon, Michael Kapeliovich, Arthur Kerner, Ehud Grenadier, Haim Hammerman, Eugenia Nikolsky, Ariel Roguin . Incidence of Early Left Ventricular Thrombus after Acute Anterior wall Myocardial Infarction in the Primary Coronary Intervention Era. *Am Heart J*. 2009; 157:1074-1080
7. **Osherov Azriel B**. Roguin A, Aronson D, Grenadier E, Kerner A, Boulus M, Kapeliovich M, Hani A, Hammerman H, Beyar R, Nikolsky E. Impact of platelet glycoprotein IIb/IIIa receptor inhibitors on renal function in patients with ST segment elevation myocardial infarction treated with primary or rescue percutaneous coronary intervention. *EuroIntervention*. 2009 ;5:604-9
8. Cohen E, **Osherov AB**, Edry R, Sebbag A, Massalha S, Kerner A, Roguin A. Perioperative antiplatelet therapy in patients with coronary stents. *Int J Cardiol*. 2010 May 28. [Epub ahead of print]

9. Segev A, Nili N, **Osherov AB**, Qiang B, Wong AJ, Pillarisetti S, Strauss BH. A perlecan-inducing compound significantly inhibits smooth muscle cell function and in-stent intimal hyperplasia: novel insights into the diverse biological effects of perlecan. *EuroIntervention*. 2010;6:134-40
10. Gotha L, **Osherov AB.**, Tran PK, Tryggvason K and Strauss BH . Vascular Smooth Muscle Cell Response to Arterial Injury in Heparan Sulfate-Deficient Perlecan Mice: Identifying a Role for Perlecan. Under revision *JMCC* 2011.
11. Blich M, Zeidan-Shwiri T, Petcherski S, **Osherov A**, Hammerman H. Incidence, predictors and outcome of drug-eluting stent thrombosis in real-world practice. *J Invasive Cardiol*. 2010; 22:461-4.
12. McKenzie DB, Talwar S, Jokhi PP, O'Kane PD, **Osherov A**, Strauss B, Dahm J. How should I treat severe coronary artery calcification when it is not possible to dilate a balloon or deliver a RotaWire™? *EuroIntervention*. 2011 Jan; 6(6):779-83.
13. Segev A, Nili N, Qiang B, **Osherov AB**, Giordano FJ, Jaffe R, Gauldie J, Sparkes JD, Fraser AR, Ladouceur-Wodzak M, Butany J, Strauss BH. Inhibition of intimal hyperplasia after stenting by over-expression of p15: A member of the INK4 family of cyclin-dependent kinase inhibitors. *J Mol Cell Cardiol*. 2011 Mar; 50(3):417-25.
14. **Osherov AB**, Gotha L, Cheema AN, Qiang B, Strauss BH. Proteins Mediating Collagen Biosynthesis and Accumulation in Arterial Repair: Novel Targets for Anti-Restenosis Therapy. *Cardiovasc Res*. 2011 Feb 7. [Epub ahead of print]
15. Freixa X, Almasoud A, **Osherov A**, Khan S, Wainstein R, Dzavik V. Decreased risk of stent fracture related restenosis between paclitaxel eluting stents and sirolimus eluting stents. Results of long term follow up. *Catheterization and cardiovascular intervention* 2011 May 12 [Epub ahead of print]

16. Teitelbaum AA, Qi X, **Osherov AB.**, Fraser AR., Thind A, Ladouceur-Wodzak M, Munce N, Anderson K, Qiang B, Weisbrod M, Jacobs C, Bierstone D, Erlich I, Sefton MV, Wright GA, Strauss BH. Therapeutic Angiogenesis For Facilitation of Guidewire Crossing in Experimental Arterial Chronic Total Occlusions. Accepted EuroIntervention 2012
17. Beiping Qiang, Jonathan Toma, Hiroko Fujii, **Azriel B. Osherov**, Nafiseh Nili, Paul Fefer, Michelle Samuel , Howard Leong-Poi , Bradley H. Strauss. Statin Therapy Prevents Expansive Remodelling in Venous Bypass Grafts. *Atherosclerosis*. 2012 ;223:106-13.
18. Ashley R. Fraser , Amandeep Thind , **Azriel B. Osherov** , Michelle Ladouceur-Wodzak , Beiping Qiang , Graham J. Wright , Bradley H. Strauss. PLGA microsphere treatment to facilitate guidewire crossing of the proximal fibrous cap in experimental arterial Chronic Total Occlusions. Manuscript in preparation
19. Yuesong Yang, Bradley Strauss, Beiping Qiang, **Azriel Osherov**, John J Graham, Garry Liu, Xiuling Qi, Nigel R Munce, Michelle Ladouceur-Wodzak, Normand Robert, Alexander J Dick, Graham A Wright. Improvement of LV functional performance in the chronic total coronary occlusion during the late stage is associated with the extensive collateral development. *Journal of Cardiovascular Magnetic Resonance* 2011, 13(Suppl 1):O52
20. Bradley H. Strauss, **Azriel B. Osherov**, Sam Radhakrishnan, GB John Mancini , Allison Manners, John D. Sparkes and Robert J. Chisholm. First-In-Man Collagenase Total Occlusion-1 (CTO-1) Trial. *Circulation*. 2012 Jan 24;125(3):522-8. Epub 2011 Dec 16.
21. Paul Fefer, Merrill L. Knudtson, Asim Cheema, P. Diane Galbraith , **Azriel B. Osherov**, Sergey Yalonetsky, Sharon Gannot , Michelle Samuel, Max Weisbrod, Daniel Bierstone, John D. Sparkes , Graham J. Wright, Bradley H. Strauss. Current Perspectives on Coronary Chronic

- Total Occlusions-The Canadian Multicenter CTO Registry. JACC 2012;59:991-997
22. Beiping Qiang, Michael A. Kuliszewski, **Azriel B. Osherov**, Dimitry Rudenko, Howard Leong-Poi, Kiet Tran, Karl Tryggvason, Ulf Hedin, Karin Tran-Lundmark, Bradley H. Strauss. Perlecan Effects on Angiogenesis in a Perlecan-deficient Transgenic Mouse Hind-leg Ischemic Model. Manuscript in preparation
23. **Azriel B. Osherov**, Beiping Qiang, Michelle Ladouceur-Wodzak, Xiuling Qi Jagdish Butany, Graham A. Wright, Bradley H. Strauss. Development a novel rabbit model of calcified chronic total occlusion. Manuscript in preparation
24. Paul Fefer,, Normand Robert, Beiping Qiang, Garry Liu, Nigel Munce, Kevan Anderson, **Azriel B. Osherov**, Michelle Ladouceur-Wodzak, Xiuling Qi, Alexander Dick, Max Weisbrod, Michelle Samuel, Jagdish Butany, Graham Wright, Bradley H. Strauss. Microvessel Formation in a Porcine Model of Coronary Arterial Chronic Total Occlusions. Accepted for publication Jan 2011 Euro Intervention
25. **Azriel B. Osherov**, Peter Seidelin, Rafael Wolff, Graham Wright, Bradley H. Strauss, Normand Robert. A Novel Technique to Reduce the Operator's Exposure to Scattered Radiation in Transradial Coronary Procedures, send for publication Eurointervention 2012
26. Mark D. Osten, **Azriel Osherov**, Xavier Friexa, Joan Ivanov, Vladimir Džavík. Long Term Outcomes in Patients Undergoing Unprotected Left Main Percutaneous Coronary Intervention: A Canadian Single Centre Experience. Manuscript in preparation
27. **Azriel B. Osherov**, Beiping Qiang, Michelle Ladouceur-Wodzak, Nilesh Ghugre, Xiuling Qi, Rafael Wolff, Jagdish Butany, Graham A. Wright, Bradley H. Strauss. Developing a novel porcine model of No reflow during ST Elevation myocardial- the additional effect of distal embolization. Manuscript in preparation.

28. **Azriel B. Osherov**, Beiping Qiang, Ronen Jaffe, Ilana Erlich, Jagdish Butany, Bradley H. Strauss. Effects of Intracoronary Collagenase Injection in a Porcine Model: a Safety Dose-Finding Study. Manuscript in preparation.

**Book chapters:**

1. Structure of chronic total occlusion. **Azriel B. Osherov**, Beiping Qiang and Bradley H. Strauss. In “Coronary artery stenosis, imaging structure and physiology”. Dr. Serruys PW, Dr. Escaned J. (Editors) Published by Europa Edition/PCR Publishing in October 2010.
2. Collagenase Plaque Digestion for Facilitating Guide Wire Crossing. **Azriel B. Osherov**, Bradley H. Strauss. In “Chronic Total Occlusions: A Guide to Recanalization”. Dr. Ron Waksman and Dr. Shigeru Saito (Editors) second edition (submitted) will be published by Wiley-Blackwell 2011.
3. The Pathobiology of CTO. Sergey Yalonetsky, **Azriel B. Osherov**, and Bradley H. Strauss. In “Chronic Total Occlusions: A Guide to Recanalization”. Dr. Ron Waksman and Dr. Shigeru Saito (Editors) second edition (submitted) will be published by Wiley-Blackwell 2011.

**Active Participation in Scientific Meetings**

The 51<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, David-Intercontinental Hotel, Tel Aviv, Israel. April 2004

The 55<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, David-Intercontinental Hotel, Tel Aviv, Israel. April 2008.

Canadian Cardiovascular Congress (CCC), Montreal, Quebec. October 23-27, 2010.



The 59<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, David-Intercontinental Hotel, Tel Aviv, Israel. April 2012

EuroPCR Paris 15-18<sup>th</sup> May 2012

**Papers Presented at Scientific Meetings Published as Proceedings:**

**Azriel B. Osherov**, Beinart R, Matetzky S , Hod H , Di Segni E, Guetta V, Shechter M , Feinberg M, Elian D. Left Ventricular Apical Ballooning – A Case Series in Israeli Patients. The 51<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, David-Intercontinental Hotel, Tel Aviv, Israel. (Oral presentation) April 2004. Book of Abstracts, p. 53.

**Azriel B. Osherov**, Michal Borovik-Raz , Doron Aronson, Yoram Agmon, Michael Kapeliovich, Arthur Kerner, Ehud Grenadier, Haim Hammerman, Eugenia Nikolsky, Ariel Roguin. Incidence of Early Left Ventricular Thrombus after Acute Myocardial Infarction in the Current Primary Coronary Intervention Era. The 55<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, Tel Aviv, Israel April 2008 and at the ESC Congress Munich. August 2008.

**Azriel B. Osherov**, Doron Aronson, Ehud Grenadier, Haim Hammerman, Michael Kapeliovich, Ariel Roguin, Arthur Kerner, Shlomo Amikam, Monther Boulos, Alexander Goldberg, Pravin Kahale, Walter Markiewicz, Rafael Beyar, Eugenia Nikolsky. Impact of Platelet Glycoprotein IIb/IIIa Inhibitors in Patients with Acute Myocardial Infarction Treated with on Renal Function Primary Percutaneous Coronary Intervention. The 55<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, Tel Aviv, Israel April 2008 and at the ESC Congress Munich August 2008.

**Azriel B. Osherov**, Beiping Qiang, Michelle Ladouceur-Wodzak, Xiuling Qi Jagdish Butany, Graham A. Wright, Bradley H. Strauss. Development a novel rabbit model of calcified chronic total occlusion.

The 59<sup>st</sup> Annual Conference of the Israel Heart Society together with The Israel Society of Cardiothoracic Surgery, David-Intercontinental Hotel, Tel Aviv, Israel. April 2012

**Azriel B. Osherov**, Peter Seidelin, Rafael Wolff, Graham Wright, Bradley H. Strauss, Normand Robert. A Novel Technique to Reduce the Operator's Exposure to Scattered Radiation in Transradial Coronary Procedures.

Accepted as a poster – EuroPCR Paris 15-18<sup>th</sup> May 2012

#### **Abstracts presented at Canadian Cardiology Conference Montreal 2010:**

Bacterial Collagenase for the Treatment of Coronary Chronic Total Occlusions: The CTO-1 Trial. **Azriel B. Osherov**, Sam Radhakrishnan, Robert Chisholm, Bradley Strauss.

Perlecan Effects on Angiogenesis in a Perlecan-deficient Transgenic Mouse Hind-leg Ischemic Model. Beiping Qiang, **Azriel Osherov**, Mike Kuliszewskii, Paul Fefer, Howard Leong-Poi, Bradley Strauss.

#### **Abstracts to be presented at Canadian Cardiology Conference**

##### **Vancouver 2011:**

Beiping Qiang, Jonathan Toma, Hiroko Fujii, **Azriel B. Osherov**, Nafiseh Nili, Paul Fefer, Michelle Samuel, Howard Leong-Poi, Bradley H. Strauss. Statin Therapy Prevents Expansive Remodelling in Venous Bypass Grafts.

#### **Memberships:**

Canadian Cardiology Society, 2009- 2012

Canadian Association of Interventional Cardiology, 2009-2012

Israel Cardiology Society 2011-2013

**Extended work related education:**

Dissertation 1992-1994: Molecular and biochemical characteristics of Clonidine displacing substance. Advisor: Prof. Daphna Atlas, Hebrew University, Givat Ram Biochemical Laboratory, Jerusalem, Israel