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Education:

College: Wesleyan University, Middletown, CT
1972-1976 Major: Chemistry
Degree: B.A.

Medical School: Tufts University School of Medicine, Boston, MA
1976-1980 Degree: M.D.

Internship & Residency- Internal Medicine:
1980-1983 Harvard University - Beth Israel Hospital, Boston, MA

Fellowship: Division of Cardiology, Stanford University
1983-1986 Medical Center, Stanford, CA

Postdoctoral Fellow in Coronary Interventions:
1986-1987 Director - John B. Simpson, M.D.; Sequoia Hospital,
Redwood City, CA

Academic Appointments:

2010- Reappointment, Clinical Professor of Medicine
George Washington University
Washington, D.C.

2002-2007 Attending, Clinical Instructor- Palo Alto Veterans Administration Hospital
Stanford University
Palo Alto, CA.

2000-2002 Clinical Professor of Medicine
George Washington University
Washington, D.C.

1990-2000 Associate Professor of Medicine (Tenured)
Director, Cardiac Catheterization Laboratories,
George Washington University Medical Center,
Washington, D.C.

1988-1990 Assistant Clinical Professor, Cardiology
University of California, San Francisco;
Director, Cardiac Catheterization Laboratory
San Francisco General Hospital

1987-1988 Clinical Assistant Professor, Cardiology,
Stanford University, Veterans Administration Medical Center,
Palo Alto, CA

1984-1986 Clinical Specialist, Cardiology
Stanford University Medical Center, Stanford, CA

Employment History:

2013- Medical Director, Heart Institute, Anne Arundel Medical Center, Annapolis, MD

2009- Private Practice- General and Interventional Cardiology. Anne Arundel Medical Center, Annapolis, MD,
Clinical Professor of Medicine, George Washington University Hospital, Washington, D.C.

2007-2009 Founder, CEO and Chief Medical Officer - Ouroboros, Inc.
Responsibilities include coordination and implementation of multicenter clinical trials in US and China for unique spinal implant and directing approval process through FDA and foreign regulatory bodies.

2005- 2007 Founder, President and CEO, Ouroboros, Inc., San Diego, CA.
Ouroboros is a medical device company developing unique spinal implant systems for use in total disc replacement and lumbar fusion.

2002-2005 Founder, President and CEO, Medluminal Systems, Inc., Palo Alto, CA.
Medluminal Systems developed a unique catheter based drug delivery systems for use in treatment of peripheral vascular disease used as an alternative to drug eluting stents.

1990-2002 Associate Professor of Medicine; Director, Cardiac Catheterization Laboratories, Professor of Medicine, George Washington University, Medical Center, Washington, D.C

1988-1990 Associate Professor of Medicine, Univ. of California, San Francisco
Director, Cardiac Catheterization Lab, San Francisco General Hospital

1986-1990 Founder, President and CEO, Cardiometrics, Inc. Mountain View, CA.

Cardiometrics developed and marketed the Flowire for diagnostic use in PTCA. Cardiometrics became a public company in 1990 and was subsequently acquired by Endosonics, Inc.

1986-1990 Active Staff, Internal Medicine and Cardiology, Sequoia Hospital District, Redwood City, CA;

1983-1986 Attending, Internal Medicine Chope Community Hospital, San Mateo, CA

Licenses and Certification:

1999 Maryland Medical Licensure (active)
1999 Diplomate, Interventional Cardiology- ABIM
1990 District of Columbia Medical Licensure (active)
1985 Diplomate, Subspecialty of Cardiovascular Disease- ABIM
1983 Diplomate, American Board of Internal Medicine- ABIM
1982 California State Medical Licensure
1981 Massachusetts State Medical Licensure
1981 Diplomate, National Board of Medical Examiners

Honors & Awards

1979 Alpha Omega Alpha, Tufts University School of Medicine
1976-1980 Leopold Schepp Foundation Scholarship; F. August Trust
1976- Atlantic Medical Society Award; E. Levinthal Trust Scholarship; Tufts University School of Medicine, Boston, MA
1976 B.A., magna cum laude; Phi Beta Kappa; Sigma Xi; Wesleyan University, Middletown, CT

Professional Organizations

1993 Fellow, Society for Cardiac Angiography and Interventions
1989 Fellow, American College of Cardiology
1983 Member, American College of Physicians;
Member, American Heart Association

Corporate Affiliations

Chairman- Scientific Advisory Board - Interventional Technologies, Inc.
Member - Scientific Advisory Board – Cardiometrics, Inc.
Member – Scientific Advisory Board, Ouroboros, Inc.

Research Activities

1. Principal Investigator, "Percutaneous Coronary Laser Angioplasty Using the Excimer - 300 Laser System" - George Washington University, participant in multicenter trials.

2. Principal Investigator, "Intracoronary Stenting after failed PTCA, using the Gianturco-Roubin Intracoronary Stent. "George Washington University, participant in multicenter trials.

3. Principal Investigator, "Intracoronary Stenting as a primary adjunct to PTCA, following restenosis." George Washington University, participant in multicenter trials.

4. Principal Investigator - "Effect of local delivery of angiopeptin with a hydrophilic coated balloon angioplasty catheter on atherogenesis." George Washington University.

5. Principal Investigator, "ENDPT" multicenter trial for Doppler intracoronary flowwire measurements performed during PTCA and their relationship to clinical outcome and restenosis - George Washington University.

6. Principal Investigator, "Correlation of thallium scintigraphy to phasic coronary flow measurements made using a Doppler guidewire." George Washington University.

7. Principal Investigator, "VALID - Velocity Assessment for Lesions of Indeterminant Severity" multicenter trial of medical therapy versus PTCA for lesions measured using the Doppler flowwire." George Washington University.

8. Principal Investigator, "ATLAS - Aspirin Ticlid Anticoagulation for Stents" - Clinical study of abbreviated anticoagulation following stent placement, George Washington University.

9. Principal Investigator, "Evaulation of Free-Flow Perfusion PTCA Balloon in the Treatment of Atherosclerotic Lesions". George Washington University.

10. Principal Investigator, Fullflow Mechanical Dilation Spring Catheter", animal trials of new angioplasty catheter for FDA-IDE submission, George

Washington University.

11. Co-investigator, Assessment of Coronary collateral flow using a Doppler guidewire." St. Louis University and George Washington University.

Dr. Morton Kern - Principal Investigator.

12. Co-investigator, "Significance of intermediate coronary artery lesions." St. Louis University and George Washington University.

Dr. Morton Kern - Principal Investigator.

13. Co-investigator, "Global utilization of Streptokinase and t-PA for occluded coronary arteries (GUSTO)." Angiographic Core Laboratory. George Washington University.

14. Co-investigator, "Multi-center American research trial with cilzapril after angioplasty to prevent transluminal coronary obstruction and restenosis (Marcator)." George Washington University.

15. Co-investigator "Insulin and Pathogenesis of Atherosclerosis in Blacks" NIH92HLIH.

16. Co-investigator "A multicenter, double blind, randomized study to compare safety and efficacy of BG8967 with Heparin in patients undergoing PTCA."

17. Director, Quantitative angiographic core laboratory for Strucker coronary artery stent, multicenter trials.

18. Director, Quantitative angiographic core laboratory for VALID and ENDPT, multicenter trials for Doppler flowwire measurements during PTCA.

19. Research Supervisor to George Washington University Cardiology research fellows: Studies including:

a. "Coronary geometry and its relationship to phasic coronary artery flow velocity patterns" - recipient 1993-Squib Diagnostics/SCA & I Fellowship Program Grant."

b. "Relationship of coronary flow patterns to regional myocardial function" 1992 American Heart Association, Research Fellowship Grant

c. "Relationship of phasic coronary artery flow patterns to

thallium scintigraphy in patients undergoing Cardiac catheterization" Merck Research Fellowship Grant

d. "Effect of femoral-femoral cardiopulmonary bypass on left ventricular dysfunction and coronary flow after myocardial infarction" American Heart Association, Research Fellowship Grant.

e. "Relationship of Coronary flow patterns to regional myocardial function with dobutamine following angioplasty." American Heart Association, Research Fellowship Grant -

f. "Combined use of the instantaneous diastolic hyperemic flow velocity versus pressure slope index and intracoronary ultrasound to assess the adequacy of coronary angioplasty. (SCAI - Fellowship Grant- Application

g. "Clinical Evaluation of Doppler Determined Coronary Artery Flow Parameters in Acute Myocardial Infarction with Tc-Sestamibi Imaging", SCAI - Fellowship Grant- Application

Sponsor or Principal Investigator

American Heart Association, Washington Branch, post doctoral research fellowship grant (Dr. Yuri Deychak) . Animal research proposal to study the relationship of changes in coronary artery flow patterns and regional myocardial function.

Society for Cardiac Angiography and Interventions - post doctoral research fellowship grant (Dr. John Reiner) . Animal research project to study the effect of lesion geometry on coronary flow obstructions and changes in distal coronary artery flow parameters.

Boston Scientific Corporation, Strecker Intracoronary Stent - Database establishment and presentation of Strecker multicenter data, grant.

Winthrop Fellowship Grant, gift grant from Winthrop pharmaceuticals to fund senior interventional fellow at George Washington.

ENDPT - multicenter Doppler coronary flow trial - angiographic core laboratory, approximately 500 angiograms.

Terumo Angioplasty Glidewire, prototype development and testing in the animal laboratory..

Mansfield Synergy Perfusion Balloon, development and animal testing, estimated grant.

Schneider, Inc. Development and animal testing of a new perfusion balloon catheter.

Interventional Technologies, Inc. Animal Studies of new mechanical dilatation catheter for FDA-IDE submission for human use.

Co-Investigator

ATLAS - "Aspirin/Ticlid Anticoagulation for Stents", Clinical study of reduced anticoagulation following stent placement, Sponsor - Hoffmann-LaRoche.

GUSTO - "Global Utilization of Streptokinase and t-PA for occluded coronary arteries." Angiographic Core Laboratory.

MARCATOR - "Multi-center American Research trial with cilazapril after angioplasty to prevent transluminal coronary obstruction and restenosis".

BIOGEN Corporation - "Multi-center, double blind, randomized study to compare the safety and efficacy of BG8967 with Heparin in patients undergoing PTCA".

PACT - "Plasminogin Activator Angioplasty Compatibility Trial", multicenter clinical trial of angioplasty versus thrombolysis for acute MI.
Sponsor – Genentech.

Publications

1. Segal J, Cardiac Output obtained with a Doppler pulmonary artery catheter. JACC 1989; 13:1382-1392.

2.Segal J, Nassi M, Ford AJ: Instantaneous and continuous cardiac output in man using a Doppler pulmonary artery catheter. JACC 1990; 16:1398-1407.

3.Segal J, Guadiani V, Nishimura T: Continuous determination of cardiac output using a flow directed Doppler pulmonary catheter. JL Cardiothor Anesth 1991:5;No.4:309-15.

4.Segal J, Kern MJ, Scott NA, Docette JW, Heuser RR, Ofili E, Siegel R: Alterations of phasic coronary artery flow velocity in man during percutaneous coronary angioplasty. JACC 1992:20:276-86

5.Ardehali A, Segal J , Cheitlin MD: An improved valve-spreading catheter for producing reversible graded acute aortic insufficiency. Am Jl Phsiol;; 1987 (in press)

6.Doucette JW, Corl PD, Payne HM, Flynn AE, Goto M, Nass M, Segal J: Validation of a Doppler Guidewire for Intravascular measurement of coronary artry flow velocity Circulation 1992; 85:1899-1911.

7.Segal J. Lundergan CF: Determination of the hemodynamic significance of coronary artery stenoses of intermediate severity. Am Heart Jl 1992; 124:1073-77.

8.Segal J, Applications of coronary flow velocity during angioplasty and other coronary interventional procedures. Am Jl. Cardiol. 1993; 71:17D-25D.

9.Kern MJ, Aguirre F, Bach R, Donogue T, Segal J: Augmentation of coronary blood flow by intra-aotic balloon pumping in patients after coronary angioplasty. Circulation. 1993; 87:500-511.

10.Thompson MA, Deychalk YA, Segal J: Doppler-tipped guidewire assessment of retrograde coronary artery flow distal to a total occlusion and its reversal following laser recanalization. Am. Heart Jl. 1993; 125:526-530.

11.Ofili EQ, Labovitz AJ, Kern MJ, St. Vrain JA, Segal J, Aguirre F, Castello R: Analysis of coronary blood flow velocity dynamics in angiographically normal and stenosed arteries before and after endoluminal enlargement by angioplasty. JACC 1993; 21:308-16.

12.Donohue TJ, Kern MJ, Aguirre FV, Bach RG, Wolford T, Bell C, Segal J: Assessing the significance of coronary artery stenoses: analysis of translesional pressure-flow velocity relationships in patients. JACC 1993; 22:449-58.

13.Maldowney WP, Humphreys MH, Segal J: the diagnosis of Cardiac Tamponade in endstage renal disease patients.

14.Deychak YA, Segal J, Thompson MA, Rohrbeck SC, Mukherjee A, Herzog WR, Lundergan CF: A Doppler guidewire used to assess coronary flow during directional coronary atherectomy

15.Deychak YA, Segal J, Reiner JS, Nachnani S: Doppler guidewire derived coronary flow reserve distal to intermediate stenoses utilized in clinical decision-making regarding interventional therapy. Am. Heart Jl. 1994; 128: 178-81.

16.Ardehali A, Segal J. Cheitlin MD: Coronary flow reserve in acute aortic regurgitation JACC .

17.Deychak YA, Segal J, Reiner JS, Rohrbeck SC, Thompson MA, Lundergan CF, Ross AM, Wasserman AG: Doppler guide wire flow-velocity indexes measured distal to

coronary stenoses associated with reversible thallium perfusion defects. Am. Heart Jl. 1995; 129:219-27.

18.Borenstein D, Jenkins E, Cho S, Segal J, Ross A: The prevalence of low back pain and theraeutic requirements of interventional cardiologists, orthopedic surgeons, and rheumatologists: A possible relationship with lead aprons. Am J. Cardiol. 1997; 79:68-70.

19.Moreyra, Segal J, Taheri H, Beohar N: Coronary flow in a patient with coronary ectasia and hypertrophic cardiomyopathy .

20.Segal J, Wolinsky SC, Sunew J, Lopez A, Moreyra E: Coronary angioplasty performed using the FullFlow mechanical dilatation-perfusion catheter; initial animal experience.Cath. and Cardiovasc. Int. 2000;

21. Segal J, Scott NA, Hampikian J: Supression of proliferative response following PTCA using a new Beta radiation catheter system

22. Segal J, Scott NA: Catheter-based iontophoretic local drug delivery of a novel DNA

Book Chapters:

1. The Doppler Guidewire: A new method to evaluate coronary artery flow during percutaneous trnsluminal coronary angioplasty - in Vogel: The practice of Interventional Cardiology/Second Edition. Mosby -1992.

2. Segal J, Moreyra E: Comparative Utility of Intravascular Ultrasound versus the Doppler Flowwire in diagnostic decision-making in coronary artery disease. Chapter 9, Ultrasound Imaging in Coronary Artery Disease, Robert J. Siegel: Marcel Decker - New York,-1997.

Academic Presentations:

On request

Patents:

1. Segal J: Blood Flow Measurement Catheter (4,733,669, March 29, 1988).

2. Segal J: Ultrasonic Pulmonary Artry Catheter and Method (4,856,529, Aug.15, 1989).

3. Segal J, Corl PD, Hasse WC: Device and Method for Measuring Volumetric Blood Flow in a Vessel (4,869,263, Sept. 26, 1989).

4.Hasse WC, Segal J, Corl PD, Christian J, Williams R: Apparatus, System and Method for Measuring Spatial Average Velocity and/or Volumetric Flow of blood in a Vessel; (4,967,753, Nov. 6, 1990).

5. Nasi M, Corl PD, Williams R., Cowan M. Segal J: Apparatus and Method for Continuously Measuring Columetric Blod Flow Using Multiple Transducers and Catheter for Use Therewith (4,947,852, Aug. 14, 1990).

6. Christian J. Corl PD, Segal J, Williams R, Hasse WC: Apparatus, System and Method for Measuring Spatial Average Velocity and/or Volumetric Flow of Blood in a Vessel (4,967,753, Nov. 6, 1997).

7. Nassi M, Corl PD, Williams RG, Cowan MW, Segal J: Apparatus and Method for Continuously Measuring Volumetric Blood Flow Using Multiple Transducers and Catheter for Use Therewith (5,078,148, January 7, 1992)

8. Christian JJ, Corl PD, Segal J, Williams RG, Hasse WC: Apparatus, System and Method for Measuring Spatial Average Velocity and/or Volumetric Flow of Blood in a Vessel and Screw Joint for Use Therewith (5,105,818, April 21, 1992)

9. Christian JJ, Corl PD, Segal J, Williams RG, Hasse WC: Apparatus, System and Method for Measuring Spatial Average Velocity and/or Volumetric Flow of Blood in a Vessel and Screw Joint for Use Therewith (5,163,445, November 17, 1992)

10. Segal J: Vascular Dilatation, Device and Method (5,527,282, June 18, 1996).

11. Segal J: Vascular Dilatation, Device and Method (8,509,579, Dec. 8, 1995)

12. Segal J: Vascular Dilatation Device and Method (5,695,469, December 9, 1997)

13. Segal J: Mechanical Apparatus and Method for Deployment of Expandable Prosthesis (5,755,708, May 26, 1998).

14. Segal J: Mechanical Apparatus and Method for Dilating and Irradiating a Site of Treatment (6,059,752 May 9, 2000).

15. Yurek M, Olson T, Segal J: Apparatus and Method for Deployment of an Expandable Prosthesis having Calibrated and Longitudinally Incompressible Expansion Means (filed Sept. 1999, later abandoned.

16. Segal J, Hampikian JM, Scott NA: Device and Method for Dilating and Irradiating a Vascular Segment or Body Passageway (US PTO App# 09/735,239)

17. Segal J, Scott NA: Mechanical Apparatus and Method for Dilating and Delivering a Therapeutic Agent to a Site of Treatment (7,292,885- Nov.6, 2007)

18. Segal J, Scott NA: Mechanical Apparatus and Method for Dilating and Delivering a Therapeutic Agent to a Site of Treatment- (7,488,313- February 10, 2009)

19. Scott NA, Segal J: Charged Liposomes/Micelles with Encapsulated Medical Compounds (US-PTO App#10/214,959)

20. Segal J, Scott NA: Polymer Coated Device for Electrically Mediated Drug Delivery (7,517,342 April 14, 2009)

21. Scott NA, Segal J: Mechanical apparatus and method for dilating and delivering a therapeutic agent to a site of treatment (7,519,418 April 14, 2009)

22. Segal J, Scott NA: Apparatus and Method for Dilating and Delivering a Therapeutic Agent to Site of Treatment (7,488,314 February 10, 2009)

23. Segal J, Scott NA, Harris S: High Concentration Medicament and Polymer Coated Device for Passive Diffusional Medicament Delivery (US-PTO App# 11/027326)

24. Segal J, Yurek M: Mechanical Apparatus and Method for Artificial Disc Replacement (US-PTO App# 11/153,776)

25. Segal J, Yurek M: Mechanical Apparatus and Method for Artificial Disc Replacement (7,442,210- October 28, 2008)

26. Segal J, Yurek M, Yuan H, Yeung A: Mechanical Apparatus and Method for Artificial Disc Replacement (7,601,172- October 13, 2009)

27. Segal J, Yurek M, Yuan H, Yeung A: Mechanical Apparatus and Method for Artificial Disc Replacement (7,547,319- June 16, 2009)

28. Segal J, Yurek M: Mechanical Apparatus and Method for Artificial Disc Replacement (US-PTO App# 11/700,509)