

## CURRICULUM VITAE

January 10, 2005

**Frank D. Kolodgie, Ph.D.**

*Associate Director*

### EDUCATION

1981	B.A.	Wayne State University
1988	M.S.	University of Maryland at Baltimore
1993	Ph.D.	University of Maryland at Baltimore

### MAJOR RESEARCH

Atherosclerosis/Heart Failure

### INTERESTS

### MAJOR ACADEMIC TASKS

2005 - Present	Associate Director CV Path, A research service of the International Registry of Pathology, Inc.
1995 - 2004	Adjunct Assistant Professor Department of Pathology University of Maryland at Baltimore
1993 - Present:	Research Scientist Department of Cardiovascular Pathology Armed Forces Institute of Pathology
1984-1993:	Research Assistant Department of Cardiovascular Pathology Armed Forces Institute of Pathology
1983-1984:	Research Assistant Department of Pathology Vanderbilt University
1981-1984:	Research Assistant Department of Clinical Pharmacology Vanderbilt University

### PROFESSIONAL MEMBERSHIP

1993-present	American Heart Association
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### COMMITTEE ACTIVITIES

1996-present

American Registry of Pathology  
Research Committee

HONORS, AWARDS

1995

Young Investigator  
American College of Cardiology  
44th Annual Scientific Session

GRANT SUPPORT

7/1/92-6/30/93

Mechanisms of Cocaine-induced  
Atherogenesis  
American Registry of Pathology  
Direct Cost Awarded: \$ 20,000

7/1/93-6/30/94

The Effect of Estradiol 17 $\beta$  on Vascular  
Smooth Muscle Growth and Migration  
American Registry of Pathology  
Direct Cost Awarded: \$14,423

7/1/94-6/30/95

The Effect of Cocaine on the  
Thrombogenic Phenotype of the  
Vascular Endothelium  
American Registry of Pathology  
Direct Cost Awarded: \$ 9,000

10/1/95-10/1/96

Monocyte/Macrophage-Smooth  
Muscle  
Cell Interactions and the Pathogenesis

of Atherosclerotic Lesions  
American Registry of Pathology

7/1/97-7/1/98

Assessment of the Net Functional  
Activity of Matrix  
Metalloproteinases in  
Plaque Rupture and Erosion,  
American Registry of Pathology,  
Direct Cost Awarded: \$12,000

7/1/98-7/1/99

A Model of Vulnerable Plaque in the  
Atherosclerotic Rabbit, American  
Registry of Pathology

Direct Cost Awarded: \$14,000

7/1/01-Present

Protein Display Profiling of Culprit Plaques Responsible for Sudden Coronary Death, American Registry of Pathology, Direct Cost Awarded: \$12,000

10/1/01-Present

Imaging Apoptosis to Detect Vulnerable Atheromatous Plaque, NIH/NHLBI, RO1 HL 68657-01, (Principal Investigator, Jagat Narula, Co-investigator (20%)), Direct Cost Awarded \$750,000

6/30/00-Present

The Effect of Systemic Delivery of Paclitaxol on In-Stent Restenosis in the Rabbit (5% effort), Sponsor, American Bioscience Inc., Direct Cost Awarded, \$125,000

7/1/97-Present

Histopathologic Analysis of Distal Protection Devices, Sponsors, Microvena, AVE/PercuSurge, Cordis, Guidant, Boston Scientific/Emboloc Protection Inc., MedNova, (5% effort), Direct Cost Awarded, \$220,000

08/1/02-Present

Plaque Progression, Apoptosis, and Inflammation, NIH/NHLBI, RO1 HL 71148-01, (Principal Investigator, Renu Virmani, Co-investigator (20%)), Direct Cost Awarded \$750,000

## **PUBLICATIONS**

### **JOURNAL ARTICLES (refereed)**

1. Forman M.B., Bingham S., Kopelman H.A., Wehr C., Sandler M.P., Kolodgie F.D., Vaughn W.K., Friesinger G.C., Virmani R., Reduction of infarct size with intracoronary perfluorochemical in a canine preparation of reperfusion, *Circulation*, 1985, 71, 1060-1608

2. Kopelman H.A., Forman M.B., Wilson B.H., Kolodgie F.D., Smith R.F., Friesinger G.C., Virmani R., Right ventricular myocardial infarction in patients with chronic lung disease:

Possible role of right ventricular hypertrophy, *Journal of the American College of Cardiology*, 1985, 5, 1302-1307

3. Kolodgie F.D., Dawson A.K., Forman M.B., Virmani R., Effect of perfluorochemical (Fluosol-DA) on infarct morphology in dogs, *Virchows Archives [Cell Pathology]*, 1985, 50, 119-134

4. Duff H.J., Kolodgie F.D., Roden D.M., Woosley R.L., Electropharmacologic synergism with mexiletine and quinidine, *Journal of Cardiovascular Pharmacology*, 1986, 8, 840-846

5. Kolodgie F.D., Dawson A.K., Roden D.M., Forman M.B., Virmani R., Effect of Fluosol-DA on infarct morphology and vulnerability to ventricular arrhythmias, *American Heart Journal*, 1986, 112, 1192-1200

6. Virmani R., Kolodgie F.D., Osmialowski A.F., Zimmerman P., Mergner W.J., Forman M.B., Myocardial protection during balloon angioplasty by perfluorochemical infusion during transient ischemia produced by balloon occlusion, *American Heart Journal*, 1988, 116, 421-31

7. Virmani R., Kolodgie F.D., Osmialowski A.F., Forman M.B., Effect of perfluorochemical Fluosol-DA on infarct healing after experimental myocardial infarction in the rabbit, *Am Journal of Cardiovascular Pathology*, 1990, 3, 69-80

8. Kolodgie F.D., Virmani R., Rice H.E., Mergner W.J., Vascular reactivity during the progression of atherosclerotic plaque: A study in Watanabe Heritable Hyperlipidemic rabbits, *Circulation Research*, 1990, 66, 1112-1126.

9. Virmani R., Forman M.B., Kolodgie F.D., Myocardial Reperfusion Injury: II. Pathological Aspects. *Circulation*, 1990, 81(Suppl IV), 69-79

10. Rice H.E., Virmani R., Hart C.L., Kolodgie F.D., Farb A., Dose-dependent reduction of myocardial infarct size with the perfluorochemical Fluosol-DA, *American Heart Journal*, 1990, 120, 1039-1046

11. Farb A., Virmani R., Atkinson J.B., Kolodgie F.D., Plaque morphology and pathologic outcome after PTCA, *Journal of the American College of Cardiology*, 1990, 16, 1421-1429

12. Kolodgie F.D., Virmani R., J.F. Cornhill, Herderick E.E., Smialek J., Increase in atherosclerosis and adventitial mast cell in young cocaine abusers: An alternative mechanism of atherosclerosis and thrombosis, *Journal of the American College of Cardiology*, 1991, 17, 1553-1560

13. Kolodgie F.D., Virmani R., Farb A., Limitation of no-reflow injury by blood-free reperfusion with oxygenated perfluorochemical (Fluosol-DA 20%), *Journal of the American College of Cardiology*, 1991, 18, 215-223

14. Kolodgie F.D., Virmani R., Cornhill J.F., Herderick E.E., Malcom G.T., Mergner W.J., Cocaine: An independent risk factor for atherosclerosis: a preliminary report., *Atherosclerosis*, 1992, 97, 53-62
15. Virmani R., Kolodgie F.D., Forman M.B., Farb A., Jones R.M., Reperfusion injury in the ischemic myocardium, *Cardiovascular Pathology*, 1992, 1, 117-129
16. Farb A., Kolodgie F.D., Virmani R., Early detection of myocardial infarct size using a horseradish peroxidase technique, *Journal of Molecular and Cellular Cardiology*, 1993, 25, 343-353
17. Farb A., Kolodgie F.D., Jenkins M., Virmani R., Pathologic confirmation of infarct extension in the temporary occlusion rabbit model, *Journal of the American College of Cardiology*, 1993, 21, 1245-53
18. Kolodgie F.D., Farb A., Wilson P.S., Carlson G.C., Virmani R., Hyperoxic reperfusion is required to reduce infarct size following intravenous therapy with the perfluorochemical (Fluosol-DA 20%) or its detergent component poloxamer 188 in a poorly collateralized animal model. Absence of a role of polymorphonuclear leukocytes, *Journal of the American College of Cardiology*, 1994, 24, 1098-1108
19. Kolodgie F.D., Wilson P.S., Cornhill J.F., Herderick E.E., Mergner W.J., Virmani R., Increased prevalence of aortic fatty streaks in cholesterol-fed rabbits administered intravenous cocaine: the role of vascular endothelium, *Toxicologic Pathology*, 1993, 21, 425-435
20. Kolodgie F.D., Jacob A., Carlson G.C., Wilson P.S., Farb A., Verma A., Virmani R., Estradiol-17 $\beta$  attenuates directed migration of vascular smooth muscle cells, *Am J Pathol*, 1996, 148, 969-976
21. Alving C.R., Swartz G.M. Jr., Ribas J.L., Wassef N.M., Herderick E.E., Virmani R., Kolodgie F.D., Matyas G.R., Cornhill J.F., Anti-cholesterol vaccine: Protection of rabbits against diet-induced atherosclerosis, *J Lab Clin Med*, 1996, 127, 40-9
22. Kolodgie F.D., Farb A., Litovsky S.H., Jeffers L. A., Lee S.J., Virmani R., Myocardial protection by physiologic estrogen replacement in the ovariectomized rat, *J Mol Cell Cardiol*, 1997, 29, 2403-2414
23. Kolodgie F.D., Katocs A.S., Largis E.E., Wrenn S.M., Cornhill J.F., Herderick E.E., Lee S.J., Virmani R., Hypercholesterolemia in the rabbit induced by feeding graded amounts of low-level cholesterol: Methodological considerations regarding individual variability in response to dietary cholesterol and development of lesion type, *Arterioscler Thromb Vasc Biol*, 1996, 16, 1454-1464
24. Kolodgie, F.D., Farb A., Virmani R., Pathobiological determinants of cocaine-associated cardiovascular syndromes, *Human Pathology*, 1995, 26, 583-586

25. Alving C.R., Swartz G.M., Wassef N.M., Herderick E.E., Virmani R., Kolodgie F.D., Matyas G.R., Ribas J.L., Kenner J.R., Cornhill J.F., Prospects for an anticholesterol vaccine, *Clin Immunother*, 1995, 3, 409-414
26. Antonov A.S., Munn D.H., Kolodgie F.D., Virmani R., Gerrity R.G., Aortic endothelial cells regulate proliferation of human monocytes in vitro via a mechanism synergistic with macrophage colony-stimulating factor: Convergence at the cyclin E/p27<sup>Kip1</sup> regulatory checkpoint, *J Clin Invest*, 1997, 99, 2867-2876
27. Farb A., Kolodgie F.D., Jacob A., Lee S, J., Carlson G.C., Virmani R., Reduced arterial neointima formation by 17 $\beta$ -estradiol in ovariectomized rabbits: importance of smooth muscle cell migration, [in preparation]
28. Marczin N., Antonov A., Papapetropoulos A., Munn DH., Virmani R., Kolodgie F.D., Gerrity R., Catravas JD., Monocyte-induced downregulation of nitric oxide synthase in cultured aortic endothelial cells, *Arterioscler Throm Vasc Biol*, 1996, 16, 1095-1103
29. Papapetropoulos A., Antonov A., Virmani R., Kolodgie F.D., Munn D.H., Marczin N., Ryan JW., Gerrity RG., Catravas JD., Monocyte- and cytokine-induced down regulation of angiotensin converting enzyme in culture human and porcine endothelial cells, *Circ Res*, 1996, 79, 512-523
30. Narula J., Haider N., Virmani R., DiSalvo T.G., Kolodgie F.D., Haihjar R.J., Schmidt U., Schwinger R.H.G., Semigram M.J., Dec G.W., Khaw B.A., Apoptosis in myocytes in end-stage heart failure, *N Engl J Med*, 1996, 335, 1182-9
31. Ryan J.W., Papapetropoulos A., Ju H., Denslow N.D., Antonov A., Virmani R., Kolodgie F.D., Gerrity R.G., Catravas J.D., Aminopeptidase P is disposed on human endothelial cells. *Immunopharmacology*, 1996, 32, 149-152
32. Papapetroupoulos A., Ryan J.W., Antonov A., Virmani R., Kolodgie F.D., Gerrity R.G., Catravas J. D., Human aortic endothelial cell aminopeptidase N, *Immunopharmacology*, 1996 32, 153-156
33. Virmani R., Kolodgie F.D., Dake MD, Silver JH, Jones RM, Jenkins M. Gillespie DL. Histopathologic evaluation of an expanded polytetrafluoroethylene-nitinol stent endoprosthesis in canine iliofemoral arteries. *JVIR* 1999;10:445-456.
34. Webb, J.G., Carere. R. G., Virmani, R., Baim D., Tierstein, P., Whitlow, P., Ramee S., Kolodgie, F.D., McQueen, C., Jarochowski, M., Buller E., Lo., K., Dodek, A., Mancini, J. G., Oesterle, S. Particulate material following saphenous vein graft Angioplasty: retrieval, analysis and clinical implications, *J Am Coll Cardiol* 1999;34:468-75.
35. Narula J, Pandey P, Arbustini E, et al. Apoptosis in heart failure: release of cytochrome c from mitochondria and activation of caspase-3 in human cardiomyopathy. *Proc Natl Acad Sci U S A* 1999;96:8144-9.

36. Kolodgie F.D., Wilson P.S., Mergner W.J., Virmani R., Mechanisms of cocaine-induced increase in the permeability function of vascular endothelial cells, *Exp Mol Pathol* 1999;66:109-22.
37. Kolodgie, F.D., Narula, J., Burke, A. P., Haider, N., Farb, A., Liang, Y. H., Smialek J., Virmani R., Extensive apoptosis of macrophages at the site of plaque rupture in sudden coronary death. *Am J Pathology* 2000;157:1259-68.
37. Virmani R, Kolodgie FD, Burke AP, Farb A, Schwartz SM. Lessons from sudden coronary death: a comprehensive morphological classification scheme for atherosclerotic lesions. *Arterioscler Thromb Vasc Biol* 2000;20:1262-75.
38. Burke AP, Kolodgie FD, Farb A, Weber DK, Malcom GT, Smialek J, Virmani R. Healed plaque ruptures and sudden coronary death; evidence that subclinical rupture has a role in plaque progression. *Circulation* 2001;103:934-40.
39. Farb A, Heller PF, Shroff S, Cheng L, Kolodgie FD, Carter AJ, Scott DS, Froehlich J, Virmani R. Pathological analysis of local delivery of paclitaxel via a polymer-coated stent. *Circulation* 2001;104:473.
40. Kim KS, Waksman R, Kollum M, Bhargava B, Kent KM, Mintz GS, Kolodgie FD, Virmani R. Edge stenosis after intracoronary radiotherapy: angiographic, intravascular and histological findings. *Circulation* 2001;103:2219.
41. Fitzgerald PJ, Takagi A, Moore MP, Hayase M, Kolodgie FD, Corl D, Nassi M, Virmani R, Yock PG. Intravascular sonotherapy decreases neointimal hyperplasia after stent implantation in swine. *Circulation* 2001;103:1828-31.
42. Cottin Y, Kollum M, Kolodgie FD, Chan RC, Kim HS, Vodovotz Y, Virmani R, Waksman R, Yazdi H. Intravascular radiation accelerates atherosclerotic lesion formation of hypercholesteremic rabbits. *Cardiovasc Radiat Med.* 2001;2:231-40.
43. Kolodgie FD, Petrov A, Virmani R, Weber DK, Narula N, Hartung D, Rammohan R, Tait J, Gold HK, Narula J. Non-invasive targeting of apoptotic macrophages in experimental atherosclerosis with radiolabeled annexin V for potential detection of plaques vulnerable to rupture (in review).
44. Finn AV, Tang A, Shroff SS, Clermont A, Gold HK, Virmani R, Kolodgie FD. Stent deployment in the rat carotid artery: a model to study the influence of genetic modifiers on in-stent restenosis. *J Vasc Res* 2002;39:414-25.
45. Kim AY, Walinsky PL, Kolodgie FD, Bian C, Sperry JL, Deming CB, Peck EA, Shake JG, Ang, GB, Esmon CT, Virmani R, Stuart S, Rade JJ. Loss of thrombomodulin expression enhances local thrombin generation in autologous vein grafts *Circ Res* 2002;90:205-12.

46. Burke AP, Kolodgie FD, Farb A, Weber D, Virmani R. Morphologic predictors of arterial remodeling in coronary atherosclerosis. *Circulation* 2002;9:297-303
47. Kolodgie FD, Wight TN, Burke AP, Weber DK, Farb A, Liang Y-H, Virmani R. Differential expression of proteoglycans and hyaluronan in culprit lesions of sudden coronary death: Possible insights into plaque erosion *Arterioscler Thromb Vasc Biol.* 2002;22:1642-8.
48. Virmani R, Farb A, Kolodgie, FD, Lafont A. Drug eluting stents: are clinical and animal studies comparable (*Heart*, in-press).
49. Kolodgie FD, John M, Khurana C, Farb A, Wilson PS, Acampado E, Desai N, Shoon-Shiong P, Virmani R. Sustained reduction of in-stent neointimal growth using a novel systemic nanoparticle paclitaxel *Circulation* 2002;106:1195-1198.
50. Burke AP, Tracy RP, Kolodgie FD, Malcom GT, Zieske A, Kutys R, Pestaner J, Smialek J, Virmani R. Elevated C-reactive protein values and atherosclerosis in sudden coronary death: association with different pathologies. *Circulation* 2002;105:2019-23.
51. Farb A, Weber DK, Kolodgie, FD, Burke AP, Virmani R. Morphological predictors of restenosis after coronary artery stenting in humans. *Circulation* 2002;105:2974-80.
52. Farb A, John M, Acampado E, Kolodgie FD, Prescott MF, Virmani R. Oral everolimus inhibits in-stent neointimal growth *Circulation.* 2002;106:2379-84.
53. Burke AP, Fonseca V, Kolodgie FD, Farb A, Zieske A, Fink L, Virmani R. Increased serum homocysteine and sudden death due to coronary atherosclerosis with fibrous plaques *Arterioscler Thromb Vasc Biol.* 2002;22:1936-41.
54. Sperry JL, Deming CB, Bian C, Walinsky PL, Kass DA, Kolodgie FD, Virmani R, Kim AY, and Rade JJ. Wall tension is a potent negative regulator of in vivo thrombomodulin expression. *Circ Res* 2003;92:41-47
55. Virmani R, Liistro F, Stankovic G, Di Mario C, Montorfano M, Farb A, Kolodgie FD, Colombo A. Mechanism of late in-stent restenosis after implantation of a paclitaxel derivate-eluting polymer stent system in humans. *Circulation.* 2002;106:2649-51.
56. Pakala R, Leborgne L, Cheneau E, Chan RC, Yazdi H, Fournadjiev J, Weber D, Hellinga D, Kolodgie F, Virmani R, Waksman R. Radiation-induced atherosclerotic plaque progression in a hypercholesterolemic rabbit; a prospective vulnerable plaque model? *Cardiovasc Radiat Med.* 2003 Jul-Sep;4(3):146-51.
57. Burke AP, Jarvelainen H, Kolodgie FD, Goel A, Wight TN, Virmani R. Superficial pseudoaneurysms: clinicopathologic aspects and involvement of extracellular matrix proteoglycans. *Mod Pathol.* 2004 Feb 20 [Epub ahead of print]
58. Johnson LL, Schofield LM, Weber DK, Kolodgie F, Virmani R, Khaw BA.

Uptake of <sup>111</sup>In-Z2D3 on SPECT imaging in a swine model of coronary stent restenosis correlated with cell proliferation. *J Nucl Med.* 2004 Feb;45(2):294-9.

59. Virmani R, Guagliumi G, Farb A, Musumeci G, Grieco N, Motta T, Mihalcsik L, Tsepili M, Valsecchi O, Kolodgie FD. Localized hypersensitivity and late coronary thrombosis secondary to a sirolimus-eluting stent: should we be cautious? *Circulation.* 2004 Feb 17;109(6):701-5. Epub 2004 Jan 26.

60. Kolodgie FD, Petrov A, Virmani R, Narula N, Verjans JW, Weber DK, Hartung D, Steinmetz N, Vanderheyden JL, Vannan MA, Gold HK, Reutelingsperger CP, Hofstra L, Narula J. Targeting of apoptotic macrophages and experimental atheroma with radiolabeled annexin V: a technique with potential for noninvasive imaging of vulnerable plaque. *Circulation.* 2003 Dec 23;108(25):3134-9. Epub 2003 Dec 15.

61. Kolodgie FD, Gold HK, Burke AP, Fowler DR, Kruth HS, Weber DK, Farb A, Guerrero LJ, Hayase M, Kutys R, Narula J, Finn AV, Virmani R. Intraplaque hemorrhage and progression of coronary atheroma. *N Engl J Med.* 2003 Dec 11;349(24):2316-25.

62. Kolodgie FD, Narula J, Guillo P, Virmani R. Apoptosis in human atherosclerotic plaques. *Apoptosis.* 1999 Feb;4(1):5-10.

63. Farb A, Burke AP, Kolodgie FD, Virmani R. Pathological mechanisms of fatal late coronary stent thrombosis in humans. *Circulation.* 2003 Oct 7;108(14):1701-6. Epub 2003 Sep 22.

64. Virmani R, Burke AP, Kolodgie FD, Farb A. Pathology of the thin-cap fibroatheroma: a type of vulnerable plaque. *J Interv Cardiol.* 2003 Jun;16(3):267-72. Review.

65. Virmani R, Kolodgie FD, Farb A, Lafont A. Drug eluting stents: are human and animal studies comparable? *Heart.* 2003;89:133-8.

66. Virmani R, Kolodgie FD, Farb A. Drug-eluting stents: are they really safe? *Am Heart Hosp J.* 2004;2:85-8.

67. Virmani R, Farb A, Guagliumi G, Kolodgie FD. Drug-eluting stents: caution and concerns for long-term outcome. *Coron Artery Dis.* 2004;15:313-8.

68. Virmani R, Guagliumi G, Farb A, Musumeci G, Grieco N, Motta T, Mihalcsik L, Tsepili M, Valsecchi O, Kolodgie FD. Localized hypersensitivity and late coronary thrombosis secondary to a sirolimus-eluting stent: should we be cautious? *Circulation.* 2004;109:701-5.

### **Book Chapters and Invited Papers**

1. Kolodgie F.D., Burke A., Narula J., Mullick F.G., Virmani R., Vascular Effect of Substance Abuse, in: Karch S.B., (Eds.) *Drug Abuse Handbook*, CRC Press, Boston, MA, 1998, pp. 113-129

2. Virmani R, Kolodgie FD, Farb A, Burke AP. Pathology of Transmyocardial Angiogenesis and Arteriogenesis. *Current Interventional Cardiology reports* 1999, I:215-221
3. Farb A, Burke AP, Kolodgie FD, Virmani R. Update on the pathology of sudden coronary death. *Cardiac Electrophysiology Review* 2001;5:373-377.
4. Virmani R, Farb A, Kolodgie FD, Burke AP. Plaque morphology and coronary thrombi. *ASCP reviews of Anatomic Pathology*. In press.
5. Kolodgie, F.D., Narula, J., Guillo, P., Virmani, R., Apoptosis in Human Atherosclerotic Plaques, *Apoptosis* 1999;4:5-10
6. Virmani R, Burke AP, Farb A, Kolodgie FD. Coronary artery disease in women. *Cardiovascular Medicine, Second Edition*, James T. Willerson, Jay N. Cohn, Marc Strauss, Editor. W.B. Saunders Company. In press
7. Virmani R, Burke AP, Farb A, Kolodgie FD. Pathology of plaque rupture. *Cardiovascular Plaque Rupture*. Brown DL (Ed.), Marcel Dekker, Inc., New York. In press.
8. Virmani R, Kolodgie, FD, Farb A, Burke AP. Inflammation in coronary atherosclerosis-pathological aspects. *Inflammation and Infectious Basis of Atherosclerosis*, Jay L. Mehta (Ed), Birkhäuser Verlag AG, Basel Switzerland, 2001. pg 23-46.
9. Narula J, Kolodgie FD, Virmani R. Apoptosis and cardiomyopathy. *Curr Opin Cardiol* 2000;15:183-8.
10. Virmani R, Kolodgie FD, Farb A, Burke AP. Pathology of direct myocardial revascularization. *Current Interventional Cardiology Reports*. 2001;3:198-204.
11. Kolodgie FD, Burke AP, Farb A, Gold HK, Yuan J, Narula J, Finn AV, Virmani R. The thin-cap fibroatheroma: a type of vulnerable plaque. *Curr Opin Cardiol* 2001;16:285-92.
12. Burke AP, Weber D, Kolodgie FD, Farb A, Taylor AJ, Virmani R. Pathophysiology of calcium deposition in coronary arteries. *Herz* 2001;26:239-44.
13. Kolodgie FD, Farb A, Virmani R. Local delivery of ceramide for restenosis. Is there a future for lipid therapy. *Circ Res*. 2000;87:264-267.
14. Kolodgie FD, Narula J, Haider N, Virmani R. Apoptosis is atherosclerosis: does it contribute to plaque instability? *Apoptosis in Cardiovascular Disease*, Cardiology Clinics, Jagat Narula and Vishva M. Dixit and Leslie W. Miller, Editors. Saunders Company, 2001;19:127-139.
15. Virmani R, Kolodgie FD, Farb A, Burke AP. Angiogenesis versus arteriogenesis: can different transmyocardial revascularization approaches be distinguished? In: *Myocardial Revascularization: Novel Percutaneous Approaches*. Ed. Albela GS, Wiley-Liss, Inc. 2002, pp 49-61.

16. Burke AP, Kolodgie FD, Farb A, Virmani R. Pathogenesis and significance of calcification in coronary atherosclerosis (in-press).
17. Virmani R, Kolodgie FD, Farb A, Burke AP. Pathologic evaluation of carotid endarterectomy. *Pathology Case Reviews* 2001;6:236-243.
18. Virmani R, Farb A, Kolodgie FD. Histopathologic alterations after endovascular radiation and antiproliferative stents: similarities and differences. *Herz* 2002;27:1-6.
19. Burke AP, Farb A, Kolodgie FD, Narula J, Virmani R. Atherosclerotic plaque morphology and coronary thrombi. *J Nuc Cardiol* 2002;9:95-103
20. Virmani R, Farb A, Kolodgie FD. Histopathologic alterations after endovascular radiation and antiproliferative stents: similarities and differences. *Herz*. 2002 Feb;27:1-6.
21. Virmani R, Burke AP, Farb A, Kolodgie FD. Pathology of the unstable plaque. *Prog Cardiovasc Dis* 2002;44:349-56
22. Virmani R, Kolodgie FD, Burke AP, Farb A. The pathology of the vulnerable plaque (*Clin Cardiol*, in press)
23. Virmani R, Burke AP, Kolodgie FD, Farb A. Histopathology of carotid stenosis: correlation between the types of plaques and the risks of neurologic complications (in press).
24. Virmani R, Burke AP, Kolodgie FD, Farb A. The vulnerable plaque: the pathology of unstable lesions. *J Interv Cardiol* 2002;6:439-446
25. Virmani R, Kolodgie FD, Farb A, Lafont A. Drug eluting stents: are human and animal studies comparable? *Heart* 2003;89:133-138.
26. Virmani R, Kolodgie FD, Burke AP, Farb A. Morphology of Atherosclerosis in Acute Coronary Syndromes (ASNR, in press, 2003).
27. Virmani R, Kolodgie, FD, Burke AP, Farb A, Gold HK, Finn AV. Inflammation and coronary artery disease. 2003
28. Virmani R, Burke AP, Kolodgie FD, Farb A. Histopathology of carotid stenosis: correlation between the types of plaque and the risks of neurological complications. In: *Angioplasty and Stenting of the Carotid and Supra-Aortic Trunks*. Henry M, Ohki T, Polydorou A, Strigaris K, Kiskinis D (Eds.), Martin Dunitz, London, UK. 2004: 7-16.