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**Biography:** Dr. Ali (Cyrus) Banan is a founding Head of the Departmental Research and Education at RUSH Chicago Medical School in Illinois, and Founding Head of the University Wide Research and Education at the USC Medical School Greenville South Carolina. He has well over 20 years of extensive experiences at executive and administrative levels in the industry and academia. He has a proven track-record of successfully leading global and national research and education strategies. Dr. Banan has served on over 50 professional committees and over 100 national and international organizations, volunteer boards, government/public health councils, industry, and academia. He has been principal investigator for more than 100 grants, including over \$200 million in direct costs alone. He has secured well over \$350 million of research and education funding, including from private industry, NIH, CDC, HHS, DARPA, and venture capital. He is also the author of 300+ peer-reviewed publications, book chapters and abstract presentations as well as inventor of several worldwide patents. At

Windsor University, he is the second-highest ranking officer of the university, providing academic leadership for the university's colleges, campuses, research institutes, while overseeing academic support services and student services, and responsibility for curriculum, academic planning, faculty appointments, faculty development and promotion, and tenure decisions among many other responsibilities.

### **Abstracts**

1. Banan A, J-Y.Wang, and L.R. Johnson. Polyamines effect actin skeleton during the process of gastric mucosal healing. *The FASEB Journal*: 1474, April 1995.
2. Banan A, G. S. Smith, E.R. Kokoska, and T.A. Miller. Prostaglandins cytoprotect a human colonic carcinoma cell line against injury: role of microtubule cytoskeleton. *Gastroenterology*, Vol:112, NO.4 A64, April 1997.
3. Banan A, G. S. Smith, E.R. Kokoska, and T.A. Miller. Dm-PGE2 Protects a Human Intestinal cell Line (Caco-2) Against Ethanol Injury by stabilizing the cytoskeleton Via Protein Kinase C and Enhanced Calcium Efflux. *Gastroenterology*, Vol:112, NO.4 A64 (2nd), April 1997.
4. Banan A, G. S. Smith, E.R. Kokoska, and T.A. Miller. Importance of Actin Cytoskeleton in Prostaglandin Induced Protection Against injury in an Intestinal Epithelial cell Line, IEC-6. *The FASEB Journal*: 1277, April 1997.
5. E. R. Kokoska, G. S. Smith, A. Banan A, and T.A. Miller. Cytoprotection in A Human Gastric Cell Line. *The FASEB Journal*: 1270, April 1997.
6. E. R. Kokoska, A. Banan A, G. S. Smith, and T.A. Miller. Calcium homeostasis and cell mortality in human gastric cells (AGS) exposed to deoxycholate (DC): role of endogenous prostaglandins. *Surgical Forum*, May 1997.
7. E. R. Kokoska, A. Banan A, G. S. Smith, and T.A. Miller. Adaptive Cytoprotection (ACP) by Bile Salts in A Human Gastric Cell Line. *Gastroenterology*, Vol:112, NO.4 A179, April 1997.
8. E. R. Kokoska, A. Banan A, G. S. Smith, and T.A. Miller. Calcium Accumulation Precedes Cell Death by Deoxycholate (DC) in Human Gastric Cells. *Gastroenterology*, Vol:112, NO.4 A179 (2rd), April 1997.
9. E. R. Kokoska, G. S. Smith, A. Banan A, and T.A. Miller. The Role of Calcium and Prostaglandins in Adaptive Cytoprotection. *Gastroenterology*, Vol:112, NO.4 A179 (3rd), April 1997.
10. G.S. Smith, M.L. Boyce, D.S. Crouch, G.A. Vogler, A. Banan A, T.A. Miller. A Simplified Method for Studying Hypoxia and Reoxygenation Injury Under In Vitro Conditions. *Journal of FASEB*:1672, April 1997.
11. Banan A, G. S. Smith, and T.A. Miller. Role of the Actin Cytoskeleton in Protection by Epidermal Growth Factor and Transforming Growth Factor- $\alpha$  against Aspirin-induced Damage to Human Gastric Cells In Vitro. *Gastroenterology*, Vol:114, G0260, 1998.

12. Banan A, G. S. Smith, and T.A. Miller. Role of protein kinase C and calcium efflux in protection by growth factors against aspirin-induced injury in a human gastric cell line. *Gastroenterology*, Vol:114, G0259, 1998.
13. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Ethanol induced-barrier dysfunction is mediated by inducible-nitric oxide synthase in a human intestinal cell line: role of microtubule oxidation, nitration, and disassembly. *Gastroenterology*, Vol:116: G0593, 1999.
14. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Role of the microtubule cytoskeleton in protection by growth factors against oxidative barrier disruption in a human colonic cell line. *Gastroenterology* Vol: 116 G2364, 1999.
15. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Growth factor protection against ethanol-induced microtubule disruption and barrier dysfunction in a human intestinal cell line: Prevention of oxidation, nitration, and disassembly of tubulin. *Gastroenterology* Vol:116 G3727, 1999.
16. Banan A, L. Fitzpatrick, S. Choudhary, and A. Keshavarzian. Protective effect of rebamipide and related drugs on oxidative barrier disruption in a human intestinal cell line: Mechanism of beneficial actions. *Gastroenterology* Vol:116 G2905, 1999.
17. Mark Kennedy, Heather Decker, Kirin Kumar, A. Banan A, and A. Keshavarzian. Role of Actin Cytoskeletal Disruption in Barrier Dysfunction by Reactive Nitrogen Metabolites in a Human Colonic Cell Line. *Gastroenterology* Vol:116 G3244, 1999.
18. Banan A, Y. Zhang, S. Choudhary, and A. Keshavarzian. Protection against oxidative barrier dysfunction by growth factors in a human colonic cell line: role of G- & F-actin cytoskeleton. *Central Society for Clinical Research (CSCR)*: 218A, 1999.
19. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Peroxynitrite-induced Nitration & Oxidation in Cytoskeletal Instability & Loss of Intestinal Epithelial Barrier Function (BF). *Gastroenterology* 118 (4, pt 1): 4265, 2000.
20. S. Kommandori, A. Banan A, Y. Zhang, and A. Keshavarzian. Role of cGMP Signal Pathway in Oxidant-Induced Disruption of Actin Cytoskeleton and of Intestinal Barrier Permeability in Human Epithelial cells. *Gastroenterology* 118 (4, pt 1): 3832, 2000.
21. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Protein Kinase C (PKC) Is Required for The Protective Effects of Growth Factors (GF) on Microtubule Cytoskeleton & Intestinal Epithelial Barrier Integrity (BI). *Gastroenterology* 118 (4, pt 1), 2000.
22. Y. Zhang, A. Banan A, R. Hutte, and A. Keshavarzian. Increased Oxidation and Nitration Injury in Intestinal Mucosa of Patients with Inflammatory Bowel Disease. *Gastroenterology* 118 (4, pt 1): 4266, 2000.
23. Banan A, S. Choudhary, Y. Zhang, and A. Keshavarzian. Growth Factors Protect against Intestinal Epithelial Hyperpermeability by Stabilizing Microtubules: Role of Protein Kinase C Signal Activation and Calcium homeostasis. *Gastroenterology* 118 (4, pt 1): 2365, 2000.

24. Banan A, S. Choudhary, Y. Zhang, R. Hutte, and A. Keshavarzian. Increased Nitric Oxide Concentrations in the Intestinal Mucosa of Patients with IBD as Detected by a Novel Chemiluminescence Method. *Gastroenterology* 118 (4, pt 1): 684, 2000.
25. Banan A, Y. Zhang, S. Choudhary, R. Hutte, and A. Keshavarzian. Ethanol-Induced Intestinal Barrier Dysfunction Is Mediated Through NO Overproduction and Peroxynitrite (ONOO) Generation. *Gastroenterology* 118 (4, pt 1): 4336, 2000.
26. Y. Zhang, T. Rodell, T. Murphy, A. Banan A, S. Choudhary, and A. Keshavarzian. Orally Administered Glutathione Peroxidase-Mimetic (BXT-51072) is a potent anti-oxidant: protection against oxidation & nitration of inflamed colonic mucosa in patients with Ulcerative Colitis. *Gastroenterology* 118 (4, pt 1): 3054, 2000.
27. Banan A, J.Z. Fields, Y. Zhang, Ece Mutlu, and A. Keshavarzian. Protein Kinase C (PKC)-b1 Mediates EGF-Induced Protection of the Microtubule (MT) Cytoskeleton & Intestinal Barrier Function (BF) against Oxidant Injury. *Gastroenterology* 120 (No 5, Suppl 1): 3783, 2001.
28. A Banan A, S Kommandori, J. Z. Fields, Y. Zhang, and A. Keshavarzian. Increased cGMP levels Mediate Oxidant-Induced Disruption of the Microtubule Cytoskeleton & Increased Permeability of Monolayers of Human intestinal Cells. *Gastroenterology* 120 (No 5, Suppl 1): 3748, 2001.
29. A Banan A, J.Z. Fields, Y. Zhang, Ece Mutlu, and A. Keshavarzian. Protein Kinase C-b1 Could Explain How EGF Protects the Assembly of the F-Actin Cytoskeleton & the Stability of Intestinal Barrier Integrity (BP) against Oxidants. *Gastroenterology* 120 (No 5, Suppl 1): 2563, 2001.
30. A Banan A, J.Z. Fields, Y. Zhang, Ece Mutlu, and A. Keshavarzian. Oxidation & Nitration Injury of Key Cytoskeletal Proteins in Colonic Mucosa of Inflammatory Bowel Disease (IBD) Patients. *Gastroenterology* 120 (No 5, Suppl 1): 1433, 2001.
31. Farhadi, A Banan A, Leo Fitzpatrick, J. Z. Fields, Y. Zhang, and A. Keshavarzian. Rebamipide attenuates neutrophil oxidative burst & oxidant generation in the presence or absence of plasma or rectal dialysates from patients with inflammatory bowel disease (IBD). *Chicago Society of Gastroenterology*. Apr 2001.
32. A Banan A, Y. Zhang, J.Z. Fields, and A. Keshavarzian. iNOS Upregulation & Actin Nitration Could Explain How Oxidants Disrupt the F-Actin Cytoskeleton & Cause Hyperpermeability (HP) of Intestinal Monolayers. *Gastroenterology* 120 (No 5, Suppl 1): 1145, 2001.
33. Banan A, J.Z. Fields, Y. Zhang, Ece Mutlu, and A. Keshavarzian. Pharmacological and Targeted Molecular inhibition of PLC-g Prevents EGF-Mediated Protection of Microtubule (MT) Cytoskeleton & Intestinal Barrier Function (BF). *Gastroenterology* 120 (No 5, Suppl 1): 3786, 2001.
34. Banan A, S. Kommanduri, J.Z. Fields, and A. Keshavarzian. Elevated cGMP levels Could Explain How Oxidants Disrupt Microtubule (MT) Cytoskeleton and Increase Permeability of Epithelial Monolayers. *The FASEB Journal*, 2638 April 2001.

35. A Banan A, J.Z. Fields, Y. Zhang, and A. Keshavarzian. Protein Kinase C- $\beta$ 1 mediates EGF's Protection of Microtubule (MT) Cytoskeleton & Intestinal Barrier Function (BF) against Oxidant Injury. *The FASEB Journal*, 2589 April 2001.
36. M. Kaplan, A. Banan A, E. Mutlu, R. Mallavarapu, L. Zhang, and A. Keshavarzian. Protection by Commonly Used Herbs against Oxidant-Induced Cell Injury in a Human Colonic Cell Line. *Am J Gastro*, Vol 96(9): S296, 2001.
37. Farhadi, A. Banan A, LF. Fitzpatrick, Y. Zhang, A. Keshavarzian. The modulatory effects of plasma and colonic milieu of patients with ulcerative colitis on OPC antioxidant. *Am J Gastro*, Vol 96(9): S290, 2001.
38. Banan A, J.Z. Fields, A. Farhadi, L. Zhang, and A. Keshavarzian. Delta ( $\delta$ ) Isoform of PKC (PKC- $\delta$ ) Could Explain How Oxidants Disrupt the Microtubule (MT) Cytoskeleton and Injure Monolayers of Intestinal Epithelia. *Gastroenterology (Forum Invited Talk)* 122 (No 4, Suppl 1): 771, 2002.
39. Banan A, J.Z. Fields, A. Farhadi, L. Zhang, and A. Keshavarzian. Zeta ( $\zeta$ ) Isoform of Protein Kinase C Is a Novel Modulator of Intestinal Barrier Integrity & Cytoskeletal Assembly and Key in Cellular Protection. *Gastroenterology (Poster of Distinction)* 122 (No 4, Suppl 1): M1132, 2002.
40. Banan A, A. Farhadi J.Z. Fields, L. Zhang, and A. Keshavarzian. Role of Phospholipase C (PLC) Signaling in EGF Protection of Intestinal Integrity & F-Actin Dynamic Assembly: Requirement for Tyrosine Phosphorylation & Activation of The  $\beta$ 1 Isoform of PLC. *Gastroenterology* 122 (No 4, Suppl 1): T863, 2002.
41. Banan A, A. Farhadi J.Z. Fields, L. Zhang, and A. Keshavarzian. EGF Protects Intestinal Barrier Integrity (BI) by Stabilizing F-Actin Dynamics: Role of PKC- $\beta$ 1 Isoform Signal Activation and  $Ca^{2+}$  Homeostasis. *Gastroenterology* 122 (No 4, Suppl 1): S833, 2002.
42. Banan A, J.Z. Fields, A. Farhadi, L. Zhang, and A. Keshavarzian. EGF Protects Intestinal Barrier Integrity (BI) by Stabilizing Microtubule (MT) Assembly: Role of PKC-zeta ( $\zeta$ ) Isoform Signaling & iNOS Down-regulation. *Gastroenterology* 122 (No 4, Suppl 1): M1156, 2002.
43. R. Moghimi, A. Banan A, S. Kommandori, L. Zhang, and A. Keshavarzian. Oxidant-Induced Injury to Monolayers of Human Intestinal Epithelia: Role of cGMP Pathway in Injury to Myosin Type II Cytoskeleton. *Gastroenterology* 122 (No 4, Suppl 1): S823, 2002.
44. Farhadi, A. Keshavarzian, E.W. Holms, L. Zhang, A. Banan A. A novel gas chromatographic method for detection of urinary Sucralose: Application to the assessment of intestinal permeability. *Am J Gastro*, Vol 97(9): S79-80, 2002.
45. E. Aniziokoro, A. Farhadi, A. Banan A, M. Bakaitis, and A. Keshavarzian. Susceptibility of the small and large bowel to leakiness is a factor in alcoholics with liver disease. *Gastroenterology* 122 (No 4, Suppl 1): M1358, 2002.

46. E. Aniziokoro, L. Zhang, A. Banan A, A. Farhadi, and A. Keshavarzian. Endotoxemia and increased TNF-alpha in alcoholic liver disease are essential factors for initiating alcohol-induced liver damage. *Am J Gastro*, Vol 97(9): S91, 2002.
47. Farhadi, S. Jakate, L. Zhang, M. Bakaitis, A. Banan A, A. Keshavarzian. Differing Response of Mucosal mast cells to stress in IBD and Controls. *Am J Gastro*, Vol 97(9): S253, 2002.
48. Domm, A. Farhadi, M. Bakaitis, S. Jakate, A. Banan A, A. Keshavarzian. Intestinal mast cell activation and degranulation following physiological stress in IBD: Electron Microscopy Study. *Am J Gastro*, Vol 97(9): S255-6, 2002
49. Banan A, A. Farhadi, J. Z. Fields, L. Zhang, and A. Keshavarzian. Stimulated Human Neutrophils (PMN) Cause The Disassembly & Instability of Cytoskeleton and Disruption of Barrier Integrity (BI) of Human Intestinal Epithelia. Digestive Disease World (Gastroenterology) Conference, Orlando, May 2003.
50. Banan A, A. Farhadi, J.Z. Fields, L.J. Zhang, M. Shaikh, and A. Keshavarzian. Evidence that NF-kB Activation is Critical to Oxidant Disruption of Cytoskeleton & Barrier integrity (BI) and that its Inactivation is key to EGF Protection of Monolayers of Intestinal Epithelia. *Gastroenterology (Forum Invited Talk)*, 124 (4, supp1): 858, 2003.
51. Banan A, M. Shaikh, L.J. Zhang, A Farhadi, S. Kommanduri, E. Mutlu, and A. Keshavarzian. Upregulation of NF-kB, (IkBa.P), iNOS, and Cytoskeletal Protein Oxidation and Dysfunction in Colonic Mucosa of Patients with Inflammatory Bowel Disease (IBD). *Gastroenterology*, 124 (4, supp1): S1338, 2003.
52. Banan A, A. Farhadi, L.J. Zhang, M. Shaikh, J.Z. Fields, and A. Keshavarzian. Key role of Phospholipase C-g1 Isoform in EGF Protection of F-Actin Cytoskeleton & Intestinal Barrier Integrity (BI) against Oxidant-Induced iNOS Upregulation. *Gastroenterology*, 124 (4, supp1): M1122, 2003.
53. Banan A, J.Z. Fields, L.J. Zhang, M. Shaikh, A. Farhadi, and A. Keshavarzian. Atypical Lambda (l) Isoform of PKC (PKC-l) Is a Novel Mediator of Intestinal Barrier Disruption & Cytoskeletal Disassembly and Essential in Oxidative Cellular Injury. *Gastroenterology (Poster of Distinction)*, 124 (4, supp1): M1126, 2003.
54. Banan A, L.J. Zhang, A. Farhadi, M. Shaikh, E. Mutlu, J.Z. Fields, S. Cotler, and A. Keshavarzian. Increase in iNOS, Free Radicals and Cytoskeletal Protein Oxidation & Nitration in Intestinal Mucosa of Patients with Alcoholic Liver Disease (ALD). *Gastroenterology*, 124 (4, supp1): M1633, 2003.
55. G. Swanson, A. Farhadi, A. Banan A, E. Mutlu, S. Cotler, and A. Keshavarzian. Increase in Urinary Neopterin in Alcoholic Liver Disease after Aspirin Challenge as a Signal of Altered Intestinal Permeability. *Gastroenterology*, 124 (4, supp1): M1634, 2003.
56. Banan A, J.Z. Fields, A. Farhadi, M. Shaikh, L.J. Zhang, and A. Keshavarzian. The Novel Delta (d) Isoform of PKC Causes iNOS & NO Upregulation: A Unique Mechanism for Oxidant-induced Carbonylation & Disassembly of the Cytoskeleton and Disruption of Barrier of Intestinal Epithelia. *Gastroenterology*, 124 (4, supp1): T906, 2003.

57. Banan A, A. Farhadi, J.Z. Fields, M. Shaikh, L.J. Zhang, and A. Keshavarzian. Zeta ( $\zeta$ ) Isoform of PKC is a Unique Modulator of NF- $\kappa$ B / I- $\kappa$ B- $\alpha$  in the Intestinal Epithelium & Critical to Monolayer Protection. *Gastroenterology* (Poster of Distinction), 124 (4, supp1): T1044, 2003.
58. Farhadi A, E. Sotil, M. Sheikh, A. Banan A, A. Keshavarzian. Is mucosal mast cell in subjects with inflammatory bowel disease different from healthy controls? *Am J Gastro* 98(9, supp1), S254, 2003.
59. Farhadi, A. Banan A, Zhang L, Keshavarzian A. Colonic Mucosal Protein Oxidation Induced by Cold Pressor Stress Test in Patients with Inflammatory Bowel Disease; A Possible Contributing Factor in the Pathogenesis and disease flare-up. *Am J Gastro* 98(9, supp1), S253-4, 2003.
60. Farhadi, Jakate S, JZ Fields, L. Zhang, A. Banan A, A. Keshavarzian. A New Approach to Intestinal Morphometric Studies: Application to the Assessment of Mucosal Mast Cell Population Size. *Am J Gastro* 98(9, supp1), S253, 2003.
61. Farhadi, JZ Fields, M. Shaikh, A. Banan A, A. Keshavarzian. Exaggerated Response to Physiological Stress in Patients with IBD; A Possible Contributing Factor in the Pathogenesis of IBD. *Am J Gastro* 98(9, supp1), S253, 2003.
62. Farhadi, Banan A A, Fields JZ, Shaikh M, Holmes EW, Keshavarzian A. Commonly used sugars Interfering with Testing for Intestinal Permeability. *Am J Gastro* 99(10, supp2), S59, 2004.
63. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Fundamental role of NF- $\kappa$ B Activation in Oxidant-induced iNOS Driven Reactions & Oxidative Stress Injury to Cytoskeleton and Barrier Integrity (BI) of Intestinal Epithelium. Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
64. Banan A, Fields JZ, Farhadi A, Zhang L, Keshavarzian A. Zeta ( $\zeta$ ) & Delta ( $\delta$ ) Isoforms of PKC Modulate Intestinal Barrier Function (BF) in Opposing Direction: Molecular Modulation of Tight-Junctional Occludin. Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
65. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Theta ( $\theta$ ) Isoform of PKC Is A New Modulator of Cytoskeletal Dynamics And A Novel Regulator of Intestinal Monolayer Barrier Function (BF) in Epithelial Cells. Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
66. Banan A, Farhadi A, Fields JZ, Zhang L, Shaikh M, Keshavarzian A. Gamma 1 ( $\gamma$ 1) isoform of Phospholipase C Uniquely Modulates NF- $\kappa$ B / I- $\kappa$ B- $\alpha$  and Is Key to EGF Protection of Monolayers of Intestinal Epithelium. Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
67. Banan A, Shaikh M, Zhang L, Farhadi A, Fields JZ, Keshavarzian A. Activation of NF- $\kappa$ B pathway (NF- $\kappa$ B Inducing Kinase /NIK, I- $\kappa$ B kinase /Ik-K, I- $\kappa$ B $\alpha$ , NF- $\kappa$ B subunits) And Cytoskeletal Protein Instability in The

- Mucosa of Patients With Inflammatory Bowel Disease (IBD). Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
68. Banan A, Shaikh M, Zhang L, Farhadi A, Fields JZ, Keshavarzian A. Changes in Activity of Distinct PKC isoforms - PKC-Zeta and PKC-Delta - Could Explain the Extent of Oxidative Injury & NF-kB Activation in Mucosa of Patients with Inflammatory Bowel Disease (IBD). Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
  69. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Classical Beta 1 (-b1) Isoform of PKC Is A Novel Modulator of NF-kB / I-kB-a and Crucial To EGF Protection of Cytoskeletal Assembly and Barrier Function (BF) in Intestinal Monolayers. Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
  70. Banan A, Zhang L, Shaikh M, Farhadi A, Fields JZ, Keshavarzian A. Atypical Lambda (l) Isoform of PKC Is A unique Mediator of F-Actin Cytoskeletal Disassembly & Instability and Key in Oxidative Damage to Monolayers of intestinal cells. Poster of Distinction Presentation in 104th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2004 New Orleans, LA.
  71. CB. Forsyth, Keshavarzian A, Farhadi A, Banan A A. Regulation of intestinal permeability by oxidative and environmental stress via a common metalloproteinase-epidermal growth factor receptor pathway. *Gastroenterology*, 128 (4, supp2): T1728, 2005.
  72. CB. Forsyth, Keshavarzian A, Choudhary S, Banan A A. Regulation of intestinal permeability via a MMP-EGF- receptor pathway. Forum Invited Talk Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
  73. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Delta Isoform of PKC (PKC-Delta) Is Critical in the Molecular Disruption of the Intestinal Tight-Junctional Cytoarchitecture and of monolayer barrier function: A unique Mechanism for Epithelial Injury by Oxidant Stress. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
  74. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Critical Role of the Atypical Lambda Isoform of PKC (PKC-Lambda) in Disruption of the Cytoskeletal Assembly in Monolayers of Intestinal Epithelium. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
  75. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Unique Role of NF-kB Activation in Disruption of Tight-Junctional Proteins (Occludin) and Monolayer Barrier Integrity; NF-kB Inactivation during Protection of GI Epithelium. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
  76. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. Theta Isoform of PKC (PKC-Theta) Alters Barrier Function in Intestinal Epithelium through Modulation of Distinct Claudin Isoforms: A Novel



Mechanism for Regulation of Tight-Junctional Permeability. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.

77. Banan A, Shaikh M, Zhang L, Farhadi A, Fields JZ, Keshavarzian A. Alterations in NF-kB Signaling (NIK»I-kK»IkB-alpha»NF-kB subunits) Could Explain the Extent of Barrier Tight-Junctional Oxidation & Instability in Mucosa of Patients With Inflammatory Bowel Disease (IBD): A Novel Mechanism for the Pathophysiology of IBD. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
78. Banan A, Shaikh M, Zhang L, Farhadi A, Fields JZ, Keshavarzian A. Changes in Distinct PKC isoforms – Upregulation of Atypical PKC-Lambda and Downregulation of Classical PKC-Beta-1 Predict Tissue Oxidative Stress and NF-kB Activation in Mucosa of Patients with Inflammatory Bowel Disease (IBD). Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
79. Banan A, Zhang L, Farhadi A, Shaikh M, Fields JZ, Keshavarzian A. PKC-Zeta Mediates EGF-Induced Protection through Suppression of NF-kB / I-kK-Beta: A Novel Growth Factor Repair Mechanism in Intestinal Epithelium. Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
80. Banan A, L. Zhang L, M. Shaikh, A. Farhadi, A. Keshavarzian. Key Role of PKC-Delta Isoform in Disruption of Tight-Junctional Occludin in Monolayers of Intestinal Epithelium. Poster of Distinction Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
81. Banan A, L. Zhang, J.Z. Fields, A. Farhadi, M. Shaikh, A. Keshavarzian. Zeta Isoform of PKC Is A Unique Modulator of the I-kB Kinase-Beta (I-kK-Beta) Pathway and Is Crucial to Monolayer Protection by EGF: A Novel Anti-inflammatory Mechanism in Intestinal Epithelium. Forum Invited Talk Presentation in 105th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2005 Chicago, IL.
82. Banan A, L. Zhang, M. Shaikh, C.B. Forsyth, J.Z Fields, A. Keshavarzian. Activation Of PKC-b1 Isoform – A Novel Mechanism For The Beneficial Effects Of Lactobacillus GG (LGG) On Monolayers Of Intestinal Epithelial Cells. Forum Invited Talk at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
83. Banan A, M. Shaikh, L. Zhang, E. Mutlu, A. Farhadi, J.Z. Fields, A. Keshavarzian. A Translational Strategy Suggests a Future Direction for Inflammatory Bowel Disease (IBD) Therapy: Changes in Tissue & Cellular Lambda (l) Isoform of PKC May Underlie Oxidative Stress & Inflammatory Processes in Intestinal Mucosa. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.

84. Banan A, M. Shaikh, L. Zhang, J.Z. Fields, E. Mutlu, A. Farhadi, C.B. Forsyth, A. Keshavarzian. Alterations in I-kappa B Kinase (I-kk) Pathways Predict the Instability of Mucosal Claudin Isoforms (1-5) in Patients with Inflammatory Bowel Disease: A Novel Gut Barrier Dependent Mechanism for The Pathophysiology of Human IBD. Poster of Distinction Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
85. Banan A, P. Engen, L. Zhang, M. Shaikh, J.Z. Fields, A. Keshavarzian. Ginkgo Biloba Is a Potent Anti-inflammatory Agent in Intestinal Epithelium: Therapeutic Potential for Suppression of NF-kB activation and I-kB degradation. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
86. Banan A, P. Engen, L. Zhang, M. Shaikh, A. Keshavarzian. Ginkgo Biloba Protects Against Intestinal Epithelial Barrier Hyperpermeability by Stabilizing Tight-Junctional Proteins: Role of NF-kB Inactivation, Occludin and Claudin. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
87. Banan A, L. Zhang, M. Shaikh, J.Z. Fields, A. Farhadi, C.B. Forsyth, A. Keshavarzian. The Lambda (l) Isoform of PKC Is A Unique Modulator of Inducible NO Synthase (iNOS) Signaling and Is Critical to Monolayer Disruption by Oxidative Stress: A Novel Pro-Inflammatory Mechanism in Intestinal Epithelium. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
88. Banan A, M. Shaikh, L. Zhang, E. Mutlu, A. Farhadi, C.B. Forsyth, A. Keshavarzian. A Unique Inflammatory Mechanism in Man: Dysregulation of an EGF-R and PKC Isoform [PKC-z, PKC-b1] Dependent Pathway Appears To Underlie Mucosal Oxidative Stress, NF-kB Activation and Gut Injury in Inflammatory Bowel Disease (IBD). Poster of Distinction Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
89. Banan A, L. Zhang, M. Shaikh, J.Z. Fields, A. Farhadi, C.B. Forsyth, A. Keshavarzian. Protein Kinase C-Delta (PKC-d) Isoform Is a Key Regulator of NF-kB and Its Endogenous Modulator I-kB During Oxidative Stress Injury: A Crucial Pro-Inflammatory Mechanism in Gut Epithelium. Forum Invited Talk at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
90. Banan A, L. Zhang, M. Shaikh, C.B. Forsyth, J.Z. Fields, A. Keshavarzian. PKC-b1 activation is required for Epidermal Growth Factor (EGF) Induced Cellular Migration and Cytoskeletal Remodeling in Enterocyte Monolayers: A Unique Wound Healing Mechanism in GI Epithelium. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.
91. Banan A, L. Zhang, J.Z. Fields, A. Farhadi, M. Shaikh, A. Keshavarzian. Novel Effects of PKC-Lambda (PKC-l) Isoform Activation on Intestinal Monolayers: Carbonylation and Nitration of Cytoskeletal Proteins and

Cytoskeletal and Barrier Disruption Following NO Generation in Intestinal Epithelium. Presented at 106th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2006 Los Angeles, CA.

92. Farhadi, A. Keshavarzian, S. Jakate, M. Shaikh, J.Z. Fields, A. Banan A. Reduced c-kit receptors in mucosal mast cells of IBD patients is not due to mast cell overactivation. Presented at Annual Meeting of the American College of Gastroenterology (ACG), Oct 2006 Las Vegas, NV.
93. Farhadi, C.B. Forsyth, P. Engen, A. Banan A, A. Keshavarzian. Evidence that a novel, non-chemical, non-electrical intercellular signaling system causes oxidative cytoskeletal damage in distant epithelial cells: Application to modulation of intestinal barrier integrity. Presented at Annual Meeting of the American College of Gastroenterology (ACG), Oct 2006 Las Vegas, NV.
94. Farhadi, C.B. Forsyth, P. Engen, A. Banan A, A. Keshavarzian. A novel non-chemical, non-electrical intercellular signaling system causes oxidative-induced changes in cell protein content and NF- $\kappa$ B activation in distant epithelial cells. *Gastroenterology*, 130 (4, supp2): T1167, 2006.
95. C.B. Forsyth, A. Banan A, Y. Tang, A. Keshavarzian. Ethanol Stimulates EGF-R Mediated MMP Production by Intestinal Epithelial cells. *Research Society on Alcoholism (RSA) Alcoholism Clin & Exp Res*, 31 (6): 351, 2007.
96. J. Rangan, C.B. Forsyth, S. Jakate, A. Farhadi, A. Banan A, A. Keshavarzian. Oats Supplementation Prevent Alcohol-Induced Gut Leakiness by Preventing Alcohol-Induced Oxidative Stress in Rat. *Research Society on Alcoholism (RSA) Alcoholism Clin & Exp Res*, 31 (6): 349, 2007.
97. J. Rangan, A. Farhadi, M. Sahikh, C.B. Forsyth, A. Banan A, A. Keshavarzian. Leaky Gut And Gut Derived Endotoxin Is Required for Alcoholic Steatohepatitis (ASH) in Rats. *Research Society on Alcoholism (RSA) Alcoholism Clin & Exp Res*, 31 (6): 348, 2007.
98. Lau, A. Farhadi, M. Shaikh, A. Banan A, A. Keshavarzian. Upregulation of human intestinal iNOS by Alcohol as a mechanism of oxidative stress in alcoholic liver disease. *Research Society on Alcoholism (RSA) Alcoholism Clin & Exp Res*, 31 (6): 106, 2007.
99. Y. Tang, A. Banan A, C.B. Forsyth, H.P. Nissan, M. Shaikh, L. Zhang, J. Rangan, P. Engen, A. Keshavarzian. Melatonin and colon carcinogenesis: inhibitory effect of melatonin on oxidant (H<sub>2</sub>O<sub>2</sub>)-induced  $\beta$ -catenin accumulation. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
100. Banan A, L. Zhang, M. Shaikh, C.B. Forsyth, Y. Tang, A. Farhadi, A. Keshavarzian. Changes in Activity of The Zeta ( $\zeta$ ) Isoform of PKC Is an Important Determinant of The Inflammatory Pathways: Unique Protective & Modulatory Mechanisms in Gut Epithelium. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.

101. Banan A, L. Zhang, M. Shaikh, Y. Tang, C.B. Forsyth, A. Keshavarzian. A New physiological Mechanism for Epithelial Migration & Monolayer Healing: PKC-Lambda (PKC- $\lambda$ ) Isoform Activity Is Required for Oxidant-Induced Reduction of Cellular Migration And Remodeling in Gut. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
102. Banan A, L. Zhang, M. Shaikh, C. B. Forsyth, Y. Tang, A. Keshavarzian. Activation Of PKC- $\lambda$  (Lambda) Isoform Could Explain The Proinflammatory And Non-Beneficial Effects of Bacterial Flagellin (FLG) on Monolayers Of Intestinal Cells: A Distinct PKC-dependent, Bacterial-Induced, Injurious Mechanism in Epithelium. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
103. Lau, A. Farhadi, M. Shaikh, A. Banan A, A. Keshavarzian. Alcohol induced up regulation of human intestinal iNOS: possible mechanism of oxidative stress in alcoholic liver disease (ALD). Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
104. Banan A, J. Rangan, A. Fardadi, M. Shaikh, C. B. Forsyth, Y. Tang, L. Zhang, A. Keshavarzian. Critical Role of NO Overproduction and Oxidative Stress (Nitration, Carbonylation) In Increased Gut Barrier Leakiness In An Animal Model of Alcoholic-Liver Disease (ALD). Forum Invited Talk at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
105. Banan A, M. Shaikh, L. Zhang, C. B. Forsyth, A. Farhadi, E. Mutlu, Y. Tang, A. Keshavarzian. A Unique Inflammatory Mechanism for Intestinal Injury During IBD: Modulation of A Distinct Phospholipase C- $\gamma$ 1 (PLC- $\gamma$ 1) Dependent Pathway Could Underlie EGF-Receptor Initiated Events That Lead To Mucosal Oxidative Stress And NF- $\kappa$ B Activation In Man. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
106. Lau, A. Farhadi, M. Shaikh, A. Banan A, A. Keshavarzian. Aspirin challenge unveils susceptibility to colonic hyper-permeability in subjects with alcoholic liver disease. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
107. Banan A, L. Zhang, M. Shaikh, C. B. Forsyth, Y. Tang, A. Farhadi, A. Keshavarzian. A Crucial Anti-inflammatory & Barrier Protective Mechanism in Gut Epithelium: PKC-Zeta ( $\zeta$ ) Isoform Is A Key Player in Protection of Cellular Structural Components and Is a Novel Modulator of the I- $\kappa$ B Kinase (I- $\kappa$ K) - $\alpha$  and - $\beta$  Isotype Pathways. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
108. B. Forsyth, A. Banan A, A. Farhadi, D. Hayden, A. Keshavarzian. Chemokine Receptor CXCR4 in IBD Patients May Contribute to Progression to Cancer by Stimulating EGF-R Signaling and Metalloprotease

Expression. Forum Invited Talk Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.

109. Banan A, M. Shaikh, L. Zhang, J. Z. Fields, E. Mutlu, A. Farhadi, C. B. Forsyth, A. Keshavarzian. Alterations Of PLC- $\gamma$ 1–PKC Isoform Pathway And The I-kappa B Kinase (I-kK)—NFkB Pathway Predict The Extent Of Mucosal Barrier Protein Isotype Instability in Man: A Novel Barrier Dependent Mechanism For Oxidation And IBD Pathophysiology. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
110. Banan A, P. Engen, L. Zhang, M. Shaikh, C. B. Forsyth, Y. Tang, A. Keshavarzian. Novel Therapies Against Inflammation Using Botanical Dietary Supplements – Scutellaria Baicalensis Is a Potent Suppressor of NF-kB Pathway: Anti-inflammatory Potential via Prevention of I-kB Degradation in Intestinal Epithelium. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
111. Banan A, L. Zhang, M. Shaikh, Y. Tang, C. B. Forsyth, A. Keshavarzian. Inactivation Of The Atypical PKC-Lambda (PKC- $\lambda$ ) Isoform Enhances Cellular Migration And Cytoskeletal Remodeling in Enterocyte Monolayers: A Novel Wound Healing Mechanism in Epithelium. Presented at 107th Annual Meeting of the American Gastroenterological Association (Digestive Disease Week) May, 2007 Washington, DC.
112. Banan A, R. Turpin, K. Williams, M. Reynolds. Bloodstream Infection Rates, Length of Stay, and Costs Associated with Compounded versus Multi-chamber Bag Parenteral Nutrition in Gastrointestinal Surgical Patients. Presented at Annual Meeting of American College of Gastroenterology (P264) October, 2009; San Diego, CA.
113. A Banan A, T. Pavlina, G. Zaloga, K. Harvey, R. Saddiqui. Oleic acid prevents stearic acid-induced inhibition of cell growth and pro-inflammatory responses in human aortic endothelial cells. Presented at Annual Meeting of Experimental Biology (A106 / 4551), Los Angeles, CA, 2010.