CURRICULUM VITAE
Daniel James Kenan

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Education:

- Fellowship, University of North Carolina at Chapel Hill, January 1, 2012 – June 30, 2014, Nephropathology
- Residency, Duke University, July 1, 2009 – December 31, 2011, Pathology
- Residency, Duke University, January 1, 1996-December 31, 1996, Pathology
- MD, PhD, Duke University, August 1983-December 1995, Medicine, Microbiology & Immunology
- MPhil, University of Edinburgh, Scotland, 1985, Molecular Biology
- BS, College of William and Mary, 1981, Biology & Chemistry

Professional Experience -- Employment History

- Nephropathologist, Arkana Laboratories, January 2017 - present
- Adjunct Associate Professor, University of North Carolina Department of Pathology and Laboratory Medicine, January 2017 - present
- Clinical Associate Professor, University of North Carolina Department of Pathology and Laboratory Medicine, July 2014 – December 2016
- Chief Scientific Officer, Affinergy, LLC, September 2008-June 2009
- Assistant Professor, Duke University, October 1998-August 2008
- Research Associate, Duke University, January 1, 1997- September 30, 1998, Microbiology

Licensure and Certifications:

Arkansas State Medical Board:	License # E-10263
Florida State Medical Board:	License # ME 131537
North Carolina Medical Board:	License # 97-00307
American Board of Pathology:	Anatomic Pathology # 12-624

Honors and Awards:

Cancer Center Discovery Research Award, Duke University, 1998
National Pathology Honor Society, Duke University, 1995
Alpha Omega Alpha, Duke University, 1986
Medical Scientist Training Program, Duke University, 1985
Draper Scholarship, College of William and Mary, 1981
Phi Beta Kappa, College of William and Mary, 1980

Bibliography:

- Books and chapters:

Kenan DJ, Keene JD, Henderson B: DNA Libraries in Encyclopedia of Molecular Biology, Creighton TE (ed), John Wiley & Sons, Hoboken, NJ, 2002

Kenan DJ, Keene JD, Henderson B: cDNA Libraries in Encyclopedia of Molecular Biology, Creighton TE (ed), John Wiley & Sons, Hoboken, NJ, 2002

Kenan DJ, Keene JD, Henderson B: Phage Display Libraries in Encyclopedia of Molecular Biology, Creighton TE (ed), John Wiley & Sons, Hoboken, NJ, 2002

Henderson B, Keene JD, **Kenan DJ**: Affinity Selection in Encyclopedia of Molecular Biology, Creighton TE (ed), John Wiley & Sons, Hoboken, New Jersey, 2002

Kenan, DJ, Keene, JD: In Vitro Selection of Aptamers from RNA Libraries in RNA-Protein Interaction Protocols, pp 217-231, Haynes S, Walker JM (eds), Methods in Molecular Biology Volume 118, Humana Press, Totowa, New Jersey, 1999

- Refereed papers/articles:

Caza TN, Hassen S, Kuperman M, Sharma S, Dvanajscak Z, Arthur JM, Edmondson RD, Storey AJ, Herzog C, **Kenan DJ**, Larsen CP. NCAM1: A Novel Autoantigen in Membranous Lupus Nephritis. Kid Int. 2020; in press.

Caza TN, Hassen S, Dvanajscak Z, Kuperman M, Edmondson RD, Herzog C, Storey AJ, Arthur JM, Cossey LN, Sharma S, **Kenan DJ**, Larsen CP. NELL1: A Target Antigen in Malignancy-Associated Membranous Nephropathy. Kid Int. 2020; in press.
DOI: 10.1016/j.kint.2020.07.039//preprints.2261

Best Rocha A, Stroberg E, Barton LM, Duval EJ, Mukhopadhyay S, Yarid N, Caza T, Wilson JD, **Kenan DJ**, Kuperman M, Sharma SG, Larsen CP. Detection of SARS-CoV-2 in formalin-fixed paraffin-embedded tissue sections using commercially available reagents. Lab Invest. 2020. PMCID: PMC7344352.

Nickeleit V, Singh HK, **Kenan DJ**, Mieczkowski PA. The two-faced nature of BK polyomavirus: lytic infection or non-lytic large-T-positive carcinoma. J Pathol. 2018;246(1):7-11. PMCID: PMC6120561.

Larsen CP, Sharma SG, Caza TN, **Kenan DJ**, Storey AJ, Edmondson RD, Herzog C, Arthur JM. Serum amyloid P deposition is a sensitive and specific feature of membranous-like glomerulopathy with masked IgG kappa deposits. Kid Int. 2020;97(3):602-8.

Kenan DJ, Mieczkowski PA, Latulippe E, Côté I, Singh HKS, Nickeleit, V (2017). BK Polyomavirus Genomic Integration and Large T Antigen Expression: Evolving Paradigms in Human Oncogenesis. American Journal of Transplantation, in press.

Kenan DJ, Mieczkowski PA, Burger-Calderon R, Singh HKS, Nickeleit, V (2015). The oncogenic potential of BK-polyomavirus is linked to viral integration into the human genome. The Journal of Pathology; 237: 379-389.

Nickeleit, V., Singh, H.K., Goldsmith, C.S., Miller, S.E., **Kenan, D.J.** (2013). BK virus-associated urinary bladder carcinoma in transplant recipients: productive or nonproductive polyomavirus infections in tumor cells? Hum Pathol. 44:2870-2871.

Spesock, A.H., Barefoot, B.E., Ray, C.A., **Kenan, D.J.**, Gunn, M.D., Ramsburg, E.A., and Pickup, D.J. (2011). Cowpox virus induces interleukin-10 both in vitro and in vivo. Virology 417, 87-97.

Meyers, S.R., **Kenan, D.J.**, Khoo, X., and Grinstaff, M.W. (2011). Bioactive stent surface coating that promotes endothelialization while preventing platelet adhesion. Biomacromolecules 12, 533-539.

Khoo, X., O'Toole, G.A., Nair, S.A., Snyder, B.D., **Kenan, D.J.**, and Grinstaff, M.W. (2010). Staphylococcus aureus resistance on titanium coated with multivalent PEGylated-peptides. Biomaterials 31, 9285-9292.

Huang, X., Zauscher, S., Klitzman, B., Truskey, G.A., Reichert, W.M., **Kenan, D.J.**, and Grinstaff, M.W. (2010). Peptide interfacial biomaterials improve endothelial cell adhesion and spreading on synthetic polyglycolic acid materials. Ann Biomed Eng 38, 1965-1976.

Chen, Y.H., Lipes, B.D., **Kenan, D.J.**, Staats, H.F., and Gunn, M.D. (2009). Identification of recombinant antibodies against multiple distinct toll-like receptors by homolog mining a single immune scFv phage library. J Immunol Methods 340, 144-153.

Khoo, X., Hamilton, P., O'Toole, G.A., Snyder, B.D., **Kenan, D.J.**, and Grinstaff, M.W. (2009). Directed assembly of PEGylated-peptide coatings for infection-resistant titanium metal. J Am Chem Soc 131, 10992-10997.

Meyers, S.R., Khoo, X., Huang, X., Walsh, E.B., Grinstaff, M.W., and **Kenan, D.J.** (2009). The development of peptide-based interfacial biomaterials for generating biological functionality on the surface of bioinert materials. Biomaterials 30, 277-286.

Lipes, B.D., Chen, Y.H., Ma, H., Staats, H.F., **Kenan, D.J.**, and Gunn, M.D. (2008). An entirely cell-based system to generate single-chain antibodies against cell surface receptors. J Mol Biol 379, 261-272.

Meyers, S.R., **Kenan, D.J.**, and Grinstaff, M.W. (2008). Enzymatic release of a surface-adsorbed RGD therapeutic from a cleavable peptide anchor. Chem Med Chem 3, 1645-1648.

Chi, S.L., Wahl, M.L., Mowery, Y.M., Shan, S., Mukhopadhyay, S., Hilderbrand, S.C., **Kenan, D.J.**, Lipes, B.D., Johnson, C.E., Marusich, M.F., et al. (2007). Angiostatin-like activity of a monoclonal antibody to the catalytic subunit of F1F0 ATP synthase. Cancer Res 67, 4716-4724.

Meyers, S.R., Hamilton, P.T., Walsh, E.B., **Kenan, D.J.**, and Grinstaff, M.W. (2007). Endothelialization of Titanium Surfaces. Advanced Materials 19, 2492-2498.

Kenan, D.J., Strittmatter, W.J., and Burke, J.R. (2006). Phage display screening for peptides that inhibit polyglutamine aggregation. Methods Enzymol 413, 253-273.

Kenan, D.J., Walsh, E.B., Meyers, S.R., O'Toole, G.A., Carruthers, E.G., Lee, W.K., Zauscher, S., Prata, C.A., and Grinstaff, M.W. (2006). Peptide-PEG amphiphiles as cytophobic coatings for mammalian and bacterial cells. Chem Biol 13, 695-700.

Li, H., LaBean, T.H., and **Kenan, D.J.** (2006). Single-chain antibodies against DNA aptamers for use as adapter molecules on DNA tile arrays in nanoscale materials organization. Org Biomol Chem 4, 3420-3426.

Zheng S., **Kenan D.J.**, Fischer B.M., Voynow J.A. (2006) Neutrophil Elastase Increases MUC5AC Mucin mRNA Expression via Post-Transcriptional Regulation. Proc Am Thorac Soc. 3: 543b-544.

Burwick, N.R., Wahl, M.L., Fang, J., Zhong, Z., Moser, T.L., Li, B., Capaldi, R.A., **Kenan, D.J.**, and Pizzo, S.V. (2005). An Inhibitor of the F1 subunit of ATP synthase (IF1) modulates the activity of angiostatin on the endothelial cell surface. J Biol Chem 280, 1740-1745.

Kenan, D.J., and Wahl, M.L. (2005). Ectopic localization of mitochondrial ATP synthase: a target for anti-angiogenesis intervention? J Bioenerg Biomembr 37, 461-465.

Wahl, M.L., **Kenan, D.J.**, Gonzalez-Gronow, M., and Pizzo, S.V. (2005). Angiostatin's molecular mechanism: aspects of specificity and regulation elucidated. J Cell Biochem 96, 242-261.

Burwick, N., Wahl, M., **Kenan, DJ**, and Pizzo, S. (2004). An inhibitor of the F1 subunit of ATP synthase (IF1) modulates the activity of angiostatin on the endothelial cell surface. J Immunother 27, S7-S7.

Kenan, D.J., and Keene, J.D. (2004). La gets its wings. Nature Structural and Molecular Biology 11, 303-305.

Li, X., Kimbrel, E., **Kenan, D. J.**, and McDonnell, D. P. (2002). Direct interactions between corepressors and coactivators permit the integration of nuclear receptor mediated repression and activation. Molecular Endocrinology, 16: 1482-1491.

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Ali, N., Pruijn, G. J. M., **Kenan, D. J.**, Keene, J. D. and Siddiqui, A. (2000) Human La antigen is required for the hepatitis C virus internal ribosome entry site (IRES)-mediated translation. J. Biol. Chem. 275:27531-27540.

Nagai, Y., Tucker, T., **Kenan, D. J.**, Henderson, B. H., Keene, J. D., Strittmatter, W. J., and Burke, J. R. (2000) A synthetic peptide that inhibits polyglutamine protein aggregation in vitro and in cells. J. Biol. Chem. 275:10437-10442.

Chang, C.Y., Norris, J.D., Gron, H., Paige, L.A., Hamilton, P.T., **Kenan, D.J.**, Fowlkes, D., and McDonnell, D.P. (1999) Dissection of the LXXLL nuclear receptor-coactivator interaction motif using combinatorial peptide libraries: Discovery of peptide antagonists of estrogen receptors alpha and beta. Molecular & Cellular Biology. 19:8226-8239.

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Miller, S.E., Levenson, R.M., Aldrigde, C., Hester, S., **Kenan, D.J.** and Howell, D.N. (1997) Identification of focal viral infections by confocal microscopy for subsequent ultrastructural analysis. Ultrastructural Pathology 21: 183-193.

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Svitkin, Y.V., Meerovitch, K., Lee, H.S., Dholakia, J.N., **Kenan, D.J.**, Agol, V.I. and Sonenberg, N. (1994) Internal translation initiation on poliovirus RNA: further characterization of La function in poliovirus translation in vitro. Journal of Virology 68: 1544-1550.

Maraia, R.J., **Kenan, D.J.**, and Keene, J.D. (1994) The eukaryotic transcription termination factor La mediates transcript release and facilitates reinitiation by RNA polymerase III. Molecular and Cellular Biology 14: 2147-2158.

Maraia, R.J., **Kenan, D.J.**, and Keene, J.D. (1994) Eukaryotic transcription termination factor La mediates transcript release and facilitates reinitiation by RNA polymerase III. Mol Cell Biol 14: 2147-2158.

Kenan, D.J., Tsai, D.E., and Keene, J.D. (1994) Exploring molecular diversity with combinatorial libraries. Trends in Biochemical Sciences 19: 57-64.

Chang, Y.-N., **Kenan, D.J.**, Keene, J.D., Gatignol, A. and Jeang, K.-T. (1994) Direct interactions between autoantigen La and human immunodeficiency virus leader NRA. Journal of Virology 68:7008-7020.

Meerovitch, K., Svitkin, Y.V., Lee, H.S., Lejbkowicz, F., **Kenan, D.J.**, Chan, E.K.L., Agol, V.I., Keene, J.D., and Sonenberg, N. (1993) La autoantigen enhances and corrects aberrant translation of poliovirus RNA in reticulocyte lysate. Journal of Virology 67: 3798-3807.

Tsai, D.E., **Kenan, D.J.**, and Keene, J.D. (1992) In vitro selection of an RNA epitope immunologically cross-reactive with a peptide. Proceedings of the National Academy of Sciences, U.S.A. 89: 8864-8868.

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Kenan, D.J., Query, C.C., and Keene, J.D. (1991) RNA recognition: Towards identifying the determinants of specificity. Trends in Biochemical Sciences 16: 214-220.

St. Clair, E.W., **Kenan, D**., Burch, J.A., Keene, J.D. and Pisetsky, D.S. (1990) The fine specificity of anti-La antibodies induced in mice by immunization with recombinant human La autoantigen. Journal of Immunology 144: 3868-3876.

Chambers, J.C., **Kenan, D**., Martin, B.J. and Keene, J.D. (1988) Genomic structure and amino acid sequence domains of the human La autoantigen. Journal of Biological Chemistry 263: 18043-18051.

Keene, J.D., Deutscher, S.L., **Kenan, D**., and Kelekar, A. (1987) Minireview: Nature of the La and Ro RNPs. Molecular Biology Reports 12: 235-238.

Robinson, A.C., **Kenan, D.J**., Sweeney, J., and Donachie, W.D. (1986) Further evidence for overlapping transcriptional units in an Escherichia coli cell envelope-cell division gene cluster: DNA sequence and transcriptional organization of the ddl ftsQ region. Journal of Bacteriology 167: 809-817.

Robinson, A.C., **Kenan, D.J**., Hatfull, G.F., Sullivan, N.F., Spiegelberg, R. and Donachie, W.D. (1984) DNA sequence and transcriptional organization of essential cell division genes ftsQ and ftsA of Escherichia coli: evidence for overlapping transcriptional units. Journal of Bacteriology 160: 546-555.

Grants:

Development of biomarkers for improved classification of membranous lupus Nephritis; Co-Investigator (10% effort); Agency: NIH/NIMHD; $300,934; Type R43 MD014110; Period: 7/26/2019-6/30/2020; The major goal of this project is to obtain proof of concept for the utility of mass spectrometry in determination of autoantigen types within immune complex deposits in kidney tissue biopsies from patients with membranous lupus nephritis.

Endothelial Cell Molecular Alterations in Cancer; Principal Investigator: Daniel J. Kenan, M.D., Ph.D. (20% effort); Agency: NIH/NCI; $1,278,835 TDC; Type: R33 CA94365; Period: 8/1/05-7/31/08; The major goal of this project is to develop tissue-specific epitope-tagged RNA binding proteins for detection and characterization of mRNAs that are differentially expressed in the native context of the tumor vasculature.

Interfacial Biomaterials; Principal Investigator Duke subcontract from Boston University: Daniel J. Kenan (10% effort); Agency: NIH/NIBIB; $550,954 TDC; Type: subcontract to Boston University (for R01, Mark Grinstaff, PI); Period: 9/1/03-3/31/07; The major goal of this project is to develop interfacial biomaterials that mediate interactions between endothelial cells and artificial materials for use in improved vascular grafts.

Recombinant Antibody Adjuvants for Toll-Like Receptors; Principle Investigator Project 1: Daniel J. Kenan, M.D., Ph.D. (20% effort); Component of U19 Program Project Grant, PI Michael D. Gunn; Agency: NIH/NIAID; $791,208 TDC (project 1); Type: U19 AI056572; Period: 7/1/03-12/31/07; The major goal of this project was to develop engineered single chain antibodies that mediate crosslinking and activation of Toll-Like Receptors. Such antibodies will be developed as vaccine adjuvants by conjugation of immunogens directly to the recombinant antibodies.

Endothelial Cell Molecular Alterations in Cancer; Principal Investigator: Daniel J. Kenan (20% effort); Agency: NIH/NCI; $100,000 TCD; Type: R21 CA94365; Period: 8/23/02-7/31/05; The major goal of this project was to develop tissue-specific epitope-tagged RNA binding proteins for detection and characterization of mRNAs that are differentially expressed in the native context of the tumor vasculature.

Nanoparticle Sensors for Biological Agent Detection; Principle Investigator: Ashutosh Chilkoti, Ph.D.; Kenan role on project: Co-Investigator (5% effort); Agency: CDC; $1,932,055 TDC; Type: NIRT 0303919; Period: 7/1/03-6/30/07; The major goal of this “Nanotechnology Interdisciplinary Research Team” project was to develop nanoparticle Surface Plasmon Resonance detection technologies using single chain antibodies and peptides as “receptor” molecules for detection of anthrax lethal toxin.

Biophysical Characterizations of Interfacial Biomaterial Peptide Coatings; Principal Investigator: Daniel J. Kenan, M.D., Ph.D. (5% effort); Agency: North Carolina Biotechnology Center; $60,000 TDC; Type: Collaborative Funding Grant; Period: 1/1/06-12/31/07 The major goal of this project was to develop a complete molecular model of biomedical device coatings by describing thermal stability, solvent effects, and self-interactions. To characterize this adhesion, we adapted standard high-resolution analysis techniques and developed new methods for determining bioactivity and stability in order to design better templates for future biomaterial coatings.

Modulation of Angiogenesis via the Angiostatin Receptor; Principal Investigator: Salvatore Pizzo; Kenan role on project: Co-Principal Investigator (40% effort); Agency: NIH/NCI; Type: R01 CA 086344; Period: 7/1/01-6/30/06; The goal of this project was to develop therapeutic antibodies and peptides that inhibit tumor angiogenesis in vivo by targeting the angiostatin receptor.

Development of Peptide Antagonists of Estrogen Signaling; Principal Investigator: Donald McDonnell; Kenan role on project: Co-Investigator (10% effort); Agency: Agency: NIH/NCI; Type: R01 CA090645; Period: 4/1/01-3/31/06; The major goal of this project was to develop a novel class of ER-antagonists that function by directly blocking the ability of ER to interact with transcription coactivators within target cells.

Polymer Nanowires for Device Construction; Principal Investigator: Daniel Kenan; Co-Principal Investigator: Mark Grinstaff; Agency: Army Research Office; Type: ARO research award; Period: 2/20/04-2/19/05; The goal of this project was to employ interfacial biomaterials, combinatorial libraries, peptide engineering, and polymer chemistry to develop nanowires for use in sensitive biosensing and chemical sensing applications.

Tie2-Associated Molecular Targets in Tumor Vasculature; Principal Investigator: Daniel J. Kenan; Agency: NIH/NCI; $200,000 TDC; Type: R21 CA95347; Period: 7/01/02-6/30/04; The major goal of this project was to develop antibody phage display technologies for detection and characterization of proteins that function together with the Tie2 receptor to regulate tumor angiogenesis.

Tumor Vascular Imaging Agents from Anti-Endothelial Cell scFv Phage Display Libraries; Principal Investigator: Daniel J. Kenan; Agency: NIH/NCI; $50,000 TDC; Type: Pre-ICMIC development project; Period: 8/01/02-7/31/03; This development project is a component of a pre-ICMIC P20 grant (Edward Coleman, MD, PI). The major goal of this project was to adapt scFv specific for endothelial cell surface proteins into vascular imaging agents.

Endothelial cell molecular alterations in cancer; Principal Investigator: Daniel J. Kenan; Agency: American Cancer Society-Institutional Research Grant; $14,257 TDC; Type: IRG; Period: 7/01/01-12/31/01; The major goal of this project was to develop tissue-specific epitope-tagged RNA binding proteins for detection and characterization of mRNAs that are differentially expressed in the native context of the tumor vasculature. This project provided preliminary data that enabled funding the R21/R33 project CA94365 detailed above.

Monoclonal Antibodies React with the Angiostatin Receptor to Replace Angiostatin as an Anti-Tumor Agent; Principal Investigator: Carol Wikstrand; Kenan role on project: Co-Investigator; (5% effort); Agency: The Brain Tumor Society; Type: Honorary Research Grant; Period: 9/11/00-9/10/01; The goal of this project was to develop therapeutic antibodies and peptides that inhibit brain cancer angiogenesis in vivo by targeting the angiostatin receptor.

Combinatorial Probes for Discovery of Metastatic Markers; Principal Investigator: Daniel J. Kenan, (30% effort); Agency: NIH/NCI $150,000 TDC; Type: R21 CA81088; Period: 8/1/99-7/31/01; The major goal of this project was to discover molecular alterations associated with metastasis in breast cancer.

Tissue-specific probes from combinatorial libraries; Principal Investigator: Daniel J. Kenan (35% effort); Agency: NIH/NCI; $417,353 TDC; Type: R01 CA77042; Period: 9/30/97-9/29/01; The major goal of this project was to develop technologies for detection of molecular alterations in tissues.