

CURRICULUM VITAE

ALEXANDROS MAKRIYANNIS, Ph.D.

*George D. Behrakis Chair in Pharmaceutical Biotechnology,
Professor of Pharmaceutical Science, Chemistry and Chemical Biology
Director of the Center for Drug Discovery, Northeastern University*

EDUCATION:

1960 B.Ph. Chem., University of Cairo
1967 Ph.D. (Medicinal Chemistry), University of Kansas (Supervisor E.E. Smissman)
1967-69 Post-doctoral Fellow (Synthetic Organic Chemistry), University of California, Berkeley, CA (Supervisor H. Rapoport)

PROFESSIONAL SUMMARY:

1969-70 Senior Chemist, *Smith, Kline and French Laboratories*, Philadelphia, PA (Supervisor J. Wilson)
1971-72 Research Associate, Department of Biochemistry and Pharmacology, *Tufts Medical School*, Boston, MA (Supervisor H. Mautner)
1972-74 Assistant Professor, Department of Biochemistry and Pharmacology, *Tufts Medical School*, Boston, MA
1974-80 Assistant Professor of Medicinal Chemistry, *University of Connecticut*, Storrs, CT
1980-86 Associate Professor of Medicinal Chemistry, *University of Connecticut*, Storrs, CT
1981-87 Head, Medicinal Chemistry and Pharmacognosy, School of Pharmacy, *University of Connecticut*, Storrs, CT
1983-96 Visiting Scientist, F. Bitter National Magnet Laboratory, *Massachusetts Institute of Technology*, Cambridge, MA
1985-91 Director and Founder, Institute of Organic and Pharmaceutical Chemistry, *National Hellenic Research Foundation* (Greece)
1986-04 Professor of Medicinal Chemistry and Pharmacognosy, *University of Connecticut*, Storrs, CT
Director of the Drug Design Program, Critical Technologies Initiative, *State of Connecticut*
1994-04 Professor of Molecular and Cell Biology (joint), *University of Connecticut*, Storrs, CT
1997-04 Director, Center for Drug Discovery, *University of Connecticut*, Storrs, CT
1997-04 Professor of Pharmacology (joint), *University of Connecticut Health Center*, Farmington, CT
1996-04 Board of Trustees' Distinguished Professor of Medicinal Chemistry and Molecular and Cell Biology, *University of Connecticut*, Storrs, CT
2003- Founder, *MAKScientific* (Drug Discovery Start-up)
2004- Adjunct Professor, Dept. Pharm. Sciences, *University of Connecticut*, Storrs, CT
2004- George D. Behrakis Chair in Pharmaceutical Biotechnology, Professor of Chemistry & Chemical Biology and Pharmaceutical Sciences, and Director of the Center for Drug Discovery, *Northeastern University*, Boston, MA
2012 Founder, *Pafos Pharma* (Drug Discovery Start-up)
2014- Distinguished Adjunct Professor, Dept. of Chemistry, *King Abdulaziz University*, Saudi Arabia
2016 New England Center for Addiction Research (Co-Founder)

HONORS:

McNeil Endowment Fellowship (1964-67)
Research Scientist Award, NIDA (1990-95, 1995-2000)
Fellow, American Association for the Advancement of Science (1993)
President, International Cannabinoid Research Society (ICRS) (1993)

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Distinguished Scientist Award, University of Connecticut Alumni (1996)
Fellow, American Association of Pharmaceutical Sciences (1997)
National Institute of Health MERIT Awards (1997-2007, 2007-2017)
Senior Scientist NIDA Award (2000-2011)
Distinguished Professor, University of Connecticut, Board of Trustees (2002)
Research Achievement Award in Drug Design and Discovery, American Association of Pharmaceutical Scientists (AAPS) (2002)
Behrakis Trustee Chair in Pharmaceutical Biotechnology, Northeastern University (2004)
Honorary Doctorate of Philosophy, University of Athens, Greece (2005)
Recognition of Scholarly or Creative Work by Northeastern Faculty and Staff, Northeastern University (2005)
Mechoulam Life Achievement Award in Cannabinoid Research (ICRS) (2006)
Distinguished Patent Award, University of Connecticut (2007)
Kenneth E. Avis Award in Medicinal Chemistry (2007)
Marquis Who's Who in Science and Engineering (2007)
ACS Research Lifetime Achievement Award in Medicinal Chemistry (2012)
Annual NU Award for Excellence in Research and Creativity (2012)
ACS Medicinal Chemistry Hall of Fame (2013)
Highly Cited Researcher, Thomson Reuters (2014)
Distinguished Professor, Northeastern University (2015)
AAPS Distinguished Pharmaceutical Scientist Award (2015)
Honorary Doctorate of Philosophy, University of Crete Medical School, Greece (2018)
CPDD Nathan B. Eddy Memorial Award (2018)
ICRS President's Lecture (2019)

FIELDS OF SPECIALIZATION:

Target-based drug design and synthesis; chemical biology; chemical pharmacology; membrane and protein biophysics (LC/MS/MS-NMR); proteomic and metabolomic LC/MS technologies

RESEARCH INTERESTS:

Cannabinergic agents; drugs of abuse; structure and function of G-protein coupled receptors and enzymes; enzyme inhibitors; drug-membrane interactions; neurosteroids; endocannabinoid biomarkers

CONSULTING ACTIVITIES:

Glaxo Wellcome; Bristol Myers; Genaissance Pharmaceuticals (Co-Chair, Scientific Advisory Board); Medochemie (Cyprus); Pfizer; Synaptic Corporation; MAKScientific (Chairman Scientific Advisory Board); Forest Laboratories, Inc.; Biogen Idec; Aileron Therapeutics; Nestle; Ischemix, Inc.

ADVISORY APPOINTMENTS:

Consultant Intramural NIAAA Biophysics Research Program (1985-87)
Ad Hoc Member, NIDA Study Section (1985-89)
Senior Advisor National Research Council of Greece (1985-present)
NIDA Special Rev. Committee (1987-2000)
Member of Ad Hoc Committee NIAID (1990-1992)
Member, NIDA-L Medications Development Review Committee (1998-2004); Chair (2001-2004)
Member, NIH MCDN-5 Review Committee (1998-2008)

American Association of Pharmaceutical Scientists (AAPS)-Chair, Division of Medicinal Chemistry and Natural Products (1998-99); Chair, Division of Drug Design and Discovery (1999-00)
 Member, Nat. Advisory Council for the Center for Medicinal Cannabis Research (2001-present)
 Member, External Review Board, Institut de Recherches Cliniques de Montreal (2006-present)
 Member, Scientific Review Board of the Institute for the Study of Aging, Alzheimer's Drug Discovery Foundation (2007-present)
 Member, NIH Drug Discovery Scientific Study Section (2008-2012)
 Member of Industry Consulting Board, Tufts Clinical and Translational Science Institute, Tufts Medical Center, Boston, MA (2009)
 Member, Drug Discovery for the Nervous System Review Group (2009-present)
 Member, Awards Committee, American Association of Pharmaceutical Scientists (AAPS) (2010-present)
 Board Member, Alzheimer Drug Discovery Foundation (2016 - present)
 Molecular Neuropharmacology and Signaling Study Section, Center for Scientific Review (2019-present)

EDITORIAL ACTIVITIES:

1999-04 PharmSci, Senior Associate Editor for Medicinal Chemistry
 2001-06 Member, Editorial Board, Il Farmaco
 2002-07 Member, Editorial Board, Journal of Medicinal Chemistry
 2002- Member, Editorial Advisory Board, Letters in Drug Design and Discovery
 2010- Member, Editorial Board, Global Journal of Organic Chemistry
 2014- Member, Editorial Board, American Journal of Pharmaceutical Sciences
 2014- Member, Editorial Board, Journal of Nanomedicine Research
 2015- Member, Editorial Board, Computational Drug Discovery
 2017- Member, Editorial Board, Journal of Addiction Research

ACADEMIC ACTIVITIES:

1976-04 Member, Institute of Materials Science, University of Connecticut, Storrs, CT
 1980-87 Member, Polymer Science Program, University of Connecticut, Storrs, CT
 1983-11 Chairman, Organizing Committee for 1st through 12th Cyprus Conference on "New Methods in Drug Research"
 1987-98 Member, Biomolecular and Structural Analysis Center, University of Connecticut Health Center, Farmington, CT
 2007-08 Member, Research Policy Oversight Committee, Northeastern University, Boston, MA
 2011-12 Member, Research Policy Oversight Committee, Northeastern University, Boston, MA
 2011- Member, Dean's Leadership Team, Northeastern University, Boston, MA
 2011- Member, Tenure and Promotion Committee, Pharmaceutical Sciences, Northeastern University, Boston, MA
 2013-15 Member, Faculty Senate, Northeastern University, Boston, MA
 2013- Affiliated Professor, Bioengineering Graduate Program, Northeastern University, Boston MA
 2017- Founder, Chemistry and Pharmacology of Drug Abuse Conference, Northeastern University, Boston, MA

PROFESSIONAL MEMBERSHIPS:

American Chemical Society (ACS), American College of Neuropsychopharmacology (ACNP) Emeritus Membership Status, The Protein Society, American Association for the Advancement of Science (AAAS, Science), American Association of Colleges of Pharmacy (AACP), The Society of Neuroscience (SfN), American Society for Pharmacology and Experimental Therapeutics (ASPET), The New York

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Academy of Science, Molecular Neuropharmacology and Signaling Study Section (MNPS), American Society for Biochemistry and Molecular Biology (ASBMB), American Association of Pharmaceutical Scientists (AAPS), International Cannabinoid Research Society (ICRS), American Society for Microbiology (ASM), American Society for Neurochemistry (ASN)

INVENTIONS:

- 1995 “Compositions Useful as a Cannabinoid Receptor Probe” – A. Makriyannis, G. Yan, V. Abadji
 1996 “Phospholipid Compounds and Use Thereof” – A. Makriyannis, R. Duclos Jr., D. Fournier
 1997 “Anandamide Amidase Inhibitors as Analgesic Agents” – A. Makriyannis, S. Lin, W. Hill
 1998 “Phospholipid Compounds and Use Thereof” – A. Makriyannis, R. Duclos, Jr., D. Fourier
 1999 “Compositions Useful as a Cannabinoid Receptor Probe” – A. Makriyannis, Y. Guo, V. Abadji
 1999 “Anandamide Amidase Inhibitors as Analgesic Agents” – A. Makriyannis, S. Yin, W. Hill
 2000 “Cannabinoids Selective for the CB2 Receptor” – A. Makriyannis, A. Khanolkar, D. Lu
 2002 “Anandamide Inhibitors as Analgesic Agents” – A. Makriyannis, S. Yin, W. Hill
 2003 “Anandamide Amidase Inhibitors as Analgesic Agents” – A. Makriyannis, S. Yin, W. Hill
 2005 “Bicyclic cannabinoid Agonists for the Cannabinoid Receptor” – A. Makriyannis, A. Khanolkar
 2005 “Cannabimimetic Indole Derivatives” – A. Makriyannis, H. Deng
 2005 “Analgesic and Immunomodulatory Cannabinoids” – A. Makriyannis, D. Lu, A. Khanolkar
 2006 “Peripheral Cannabinoid Receptor (CB2) Selective Ligands” – A. Makriyannis, A. Khanolkar
 2006 “Bicyclic and Tricyclic Cannabinoids” – A. Makriyannis, S. Nikas, A. Khanolkar
 2006 “GABA A Modulating Neurosteroids” – A. Makriyannis, T. Calogeropoulou, A. Tsotinis, C. Souli
 2006 “Bifunctional Agents Possessing Antioxidant and Antiarrhythmic Activity” – A. Makriyannis, M. Koufaki, T. Calogeropoulou
 2006 “Pyrazole Derivatives as Cannabinoid Receptor Antagonists” – A. Makriyannis, Q. Liu
 2007 “Cannabimimetic Lipid Amides as Useful Medications” – A. Makriyannis, A. Khanolkar, A. Goutopoulos
 2007 “Receptor Selective Cannabimimetic Aminoalkylindoles” – A. Makriyannis, H. Deng
 2007 “Keto Cannabinoids with Therapeutic Indications” – A. Makriyannis, D. Lu, X. Lai
 2007 “Cannabimimetic Indole Derivatives” – A. Makriyannis, H. Deng
 2007 “Retro-anandamides, High affinity and Stability Cannabinoid Receptor Ligands” – A. Makriyannis, Q. Liu, A. Goutopoulos
 2007 “Bicyclic and Tricyclic Cannabinoids” – A. Makriyannis, S. Nikas, A. Khanolkar
 2008 “Bicyclic Cannabinoid Agonists for the Cannabinoid Receptor.” – A. Makriyannis, A. Khanolkar
 2008 “Cannabimimetic Ligands” – A. Makriyannis, H. Deng
 2008 “Pyrazole Analogs Acting on Cannabinoid Receptors” – A. Makriyannis, Q. Liu, R. Thotapally
 2008 “Bicyclic Cannabinoids” – A. Makriyannis, S. Nikas, A. Khanolkar, G. Thakur, D. Lu
 2008 “Heteroaryl Urea Compounds as Endocannabinoid Enzyme Deactivators and a Method of Their Evaluation” – A. Makriyannis, L. Pandarinathan, N. Zvonok, T. Pakkari, L. Chapman
 2009 “Inhibitors of the Anandamide Transporter” – A. Makriyannis, A. Goutsopoulos, C. Li
 2010 “Heteroindanes: A New Class of Potent Cannabimimetic Ligands” – A. Makriyannis, Q. Liu, A. Zvonok
 2010 “Peripheral Cannabinoid Receptor (CB2) Selective Ligands” – A. Makriyannis, A. Khanolkar
 2010 “Pyrazole Analogs Acting on Cannabinoid Receptors” – A. Makriyannis, Q. Liu, R. Thotapally
 2010 “Receptor Selective Cannabimimetic Aminoalkylindoles” – A. Makriyannis, H. Deng
 2011 “Inhibitors of the Anandamide Transporter” – A. Makriyannis, S. Lin, D. Piomelli
 2011 “Pyrazole Derivatives as Cannabinoid Receptor Antagonists” – A. Makriyannis, Q. Liu, R. Thotapally, V.K. Vemuri
 2011 “Novel Heteropyrrole Analogs Acting on Cannabinoid Receptors” – A. Makriyannis, V.K. Vemuri, T. Olszewska

- 2011 "Method of Developing Cannabinoids with Controlled Duration of Action and Uses Thereof" – A. Makriyannis, G.A Thakur, R. Sharma
- 2011 "Cannabinergic Resorcinol Analogs" – A. Makriyannis, S. Bajaj, M.R D'Souza, S. Nikas, G. Thakur
- 2012 "Novel Cannabinergic Nitrate Esters and Related Analogs" – A. Makriyannis, V.K. Vemuri
- 2012 "Antiprotozoal Ring-substituted Phospholipids" – A. Makriyannis, T. Calogeropoulou, M. Koufaki, N. Avlonitis
- 2012 "Cannabinergic Lipid Ligands" – A. Makriyannis, C. Li, D. Lu
- 2012 "CB1 Receptor Antagonists and Uses Thereof" – A. Makriyannis, V.K. Vemuri
- 2012 "Therapeutic Applications of Fatty Acid Amide Hydrolase Inhibitors" – A. Makriyannis, G. Kunos
- 2013 "Heteropyrrole Analogs Acting on Cannabinoid Receptors" – A. Makriyannis, R. Thotapally, V.K. Vemuri, T. Olszweska
- 2014 "Heteropyrrole Analogs Acting on Cannabinoid Receptors" – A. Makriyannis, V.K. Vemuri
- 2014 Novel Urea and Carbamates FAAH/MAGL or Dual FAAH/MAGL Inhibitors and their Uses Thereof" – A. Makriyannis, V.G. Shukla, S.O. Alapafuja
- 2014 "N-Acylethanolamine Hydrolyzing Acid Amidase (NAAA) Inhibitors and their Use Thereof" – A. Makriyannis, M. Malamas, K.V Subramanian, K. Whitten, N. Zvonok, J.M West, S. Pavlopoulos
- 2015 "Fatty Acid Amide Hydrolase Inhibitors" – A. Makriyannis, S. Nikas, S.O. Alapafuja, V.G. Shukla
- 2016 "Inhibitors of Fatty Acid Amide Hydrolase and Monoacylglycerol Lipase for Modulation of Cannabinoid Receptors" – A. Makriyannis, L. Pandarinathan, N. Zvonok, T. Parkkari, L. Chapman
- 2016 "2-Cycloalkyl Resorcinol Cannabinergic Ligands" – A. Makriyannis, M.R. D'Souza, S. Bajaj, S. Nikas, G. Thakur
- 2017 "Cannabinergic Nitrate Esters and Related Analogs" – A. Makriyannis, V.K. Vemuri
- 2017 "Carbamates ABHD6 and Dual ABHD6/MGL Inhibitors and their Use Thereof"- A. Makriyannis, M. Malamas, M. Lamani, S.I Farah

PUBLICATIONS:

1. Smissman E.E., **A. Makriyannis**, (1970), Solvent effects in the NMR spectra of cyano compounds. *J. Pharm. Sci.*, **59**, 1186. PMID: 5457343
2. Smissman E.E., **A. Makriyannis**, E.J. Walaszek, (1970), Synthesis and pharmacology of N-Cyano-(β -Arylethyl) amines. *J. Med. Chem.*, **13**, 640. PMID: 5466125
3. **Makriyannis A.**, R.F. Sullivan, H.G. Mautner, (1972), Conformational relationships between analogs of acetylcholine and those of local anesthetics in solution. *Proc. Natl. Acad. Sci.*, **69**, 3416. PMID: 4508331
4. **Makriyannis A.**, J.S. Frazee, J.W. Wilson, (1972), 3-Phenyl-5-quinolinemethanol antimalarials. *J. Med. Chem.*, **16**, 118-122. PMID: 4566626
5. **Makriyannis A.**, W.H.H. Gunther, H.G. Mautner, (1973), Selenol esters as specific reagents for the acylation of thiol groups. *J. Am. Chem. Soc.*, **95**, 8403-8406.
6. Smissman E.E., **A. Makriyannis**, (1973), Azodicarboxylic acid esters as dealkylating agents. *J. Org. Chem.*, **38**, 1652. PMID: 4709670
7. Feinstein M.B., M. Volpi, S. Perrie, **A. Makriyannis**, R.I. Sha'afi, (1977), Mechanisms of local anesthetic action on the permeability of erythrocytes, leukocytes and liposomes containing the erythrocyte anion channel protein. *Mol. Pharmacol.*, **13**, 840-851. PMID: 897520

8. **Makriyannis A.**, J. Knittel, (1978), Conformational studies on phenethylamine hallucinogens: The role of α -alkyl substitution. *NIDA Research Monograph Series*, **22**, 464-481. PMID: 101888
9. **Makriyannis A.**, J. Knittel, (1979), The conformational analysis of aromatic methoxyl groups from carbon-13 chemical shifts and spin lattice relaxation times. *Tet. Lett.*, **20**, 2753-2756.
10. **Makriyannis A.**, J. Theard, H.G. Mautner, (1979), A direct approach to the determination of the rotational barriers of the acetylcholine and choline molecules. *Biochem. Pharmacol.*, **28**, 1911-1915. PMID: 454463
11. **Makriyannis A.**, G. Hite, (1979), Nortropacocaine hydrochloride conformation in aqueous and hydrophobic media. *J. Pharm. Sci.*, **68**, 788-790. PMID: 458585
12. **Makriyannis A.**, J.B. Anderson, J. DiPiro, E. Kostiner, G. Hite, (1979), Steric requirements for adrenergic activity. I. The crystal structure of β - (2-hydroxy-phenyl) ethanolamine hydrochloride. *Acta. Crystal. B.*, **35**, 2247-2250.
13. Williams D.A., **A. Makriyannis**, (1979), Carbon-13 and proton magnetic resonance spectra of 2, 4-disubstituted 3, 3-diphenyltetrahydrofurans derived from isomethadone and isomethadol. *J. Hetero. Chem.*, **16**, 1223-1226.
14. **Makriyannis A.**, S.W. Fesik, (1980), Effects of anesthetics on sulfate transport in the red cell. *J. Neurosci. Res.*, **5**, 25-33. PMID: 7381978
15. Weintraub J.R., D.E. Nichols, **A. Makriyannis**, S.W. Fesik, (1980), Conformational energy differences between side chain-alkylated analogues of the hallucinogen DOM. *J. Med. Chem.*, **23**, 339- 341. PMID: 7365752
16. Henkel J.G., N. Sikand, **A. Makriyannis**, (1981), Synthesis and adrenoreceptor affinity of some highly polar β -substituted catecholamines. *J. Med. Chem.*, **24**, 1258-1260. PMID: 7328588
17. Knittel J., **A. Makriyannis**, (1981), Studies on phenethylamine hallucinogens. 2. Conformations of arylmethoxyl groups using ^{13}C NMR. *J. Med. Chem.*, **24**, 906-909. PMID: 7277405
18. **Makriyannis A.**, J. Knittel, (1981), The conformational analysis of amphetamine in solution based on the unambiguous assignment of diastereotopic benzylic protons in the ^1H NMR spectra. *Tet. Lett.*, **22**, 4631-4634.
19. de Jong A.P., S.W. Fesik, **A. Makriyannis**, (1982), Conformational requirements for norepinephrine uptake inhibition by phenethylamines in brain synaptosomes. Effects of α -alkyl substitution. *J. Med. Chem.*, **25**, 1438-1441. PMID: 7154004
20. de Jong A.P., F. Huggins, D. Fournier, **A. Makriyannis**, (1982), Inhibition of [^3H]5-HT binding to rat brain membranes by psychotomimetic amphetamines. *Eur. J. Pharmacol.*, **83**, 305-308. PMID: 7173311
21. **Makriyannis A.**, S.W. Fesik, (1982), Methoxy group conformations of phenyl methyl ethers in solution. *J. Am. Chem. Soc.*, **104**, 6462-6463.
22. **Makriyannis A.**, D. Bowerman, P.Y. Sze, D. Fournier, A.P. de Jong, (1982), Structure activity correlations in the inhibition of brain synaptosomal ^3H -norepinephrine uptake by phenethylamine analogs: The role of α -alkyl side chain and methoxyl ring substitutions. *Eur. J. Pharmacol.*, **81**, 337-340. PMID: 7117379
23. Naccache P., M. Volpi, E.L. Becker, **A. Makriyannis**, R.I. Sha'afi, (1982), Cannabinoid induced degranulation of rabbit neutrophils. *Biochem. Biophys. Res. Commun.*, **104**, 6462. PMID: 6288043
24. **Makriyannis A.**, J.L. Nilsson, (1983), Designing new drugs. *Pharmacy International*, **4**, 193.
25. **Makriyannis A.**, S.W. Fesik, (1983), Mechanism of steroid anesthetic action: interactions of alphaxalone and Δ^{16} -alphaxalone with bilayer vesicles. *J. Med. Chem.*, **26**, 463-465. PMID: 6834378
26. Fesik S.W., **A. Makriyannis**, (1985), Geometric requirements for membrane perturbation and anesthetic activity. Conformational analysis of alphaxalone and Δ^{16} -alphaxalone and ^2H

- NMR studies on their interactions with model membranes. *Mol. Pharmacol.*, **27**, 624-629. PMID: 4000106
27. **Makriyannis A.**, S. Fesik, R. Kriwacki, (1985), Nuclear magnetic resonance in drug research. New methods in drug research. *J.R. Prous Science Publishers*, **1**, 19-43.
 28. Ruocco M.T., **A. Makriyannis**, D.J. Siminovitch, S. Das Gupta, R.G. Griffin, (1985), Deuterium NMR study of ether and ester-linked phosphatidylcholines. *Biochemistry*, **24**, 4844-4851. PMID: 4074662
 29. **Makriyannis A.**, D.J. Siminovitch, S.K. Das Gupta, R.G. Griffin, (1986), Studies on the interactions of anesthetic steroids with phosphatidylcholine using ²H and ¹³C solid-state NMR. *Biochim. Biophys. Acta.*, **859**, 49-55. PMID: 3755060
 30. Banijamali A., **A. Makriyannis**, (1987), Separation of tetrahydrocannabinol isomers by reverse-phase high pressure liquid chromatography. *J. Liq. Chromatogr.*, **10**, 2931-2938.
 31. Banijamali A., A. Charalambous, C.J. Van der Schyf, **A. Makriyannis**, (1987), Specific deuteration of phenols and aromatic ethers using borontrifluoride and deuterium oxide. *J. Label. Compounds*, **24**, 1479-1482.
 32. **Makriyannis A.**, A. Banijamali, H. Jarrell, C.J. Van der Schyf, (1987), Interactions of cannabinoids with membranes: The role of the cannabinoid stereochemistry and absolute configuration and orientation of Δ⁹-THC in the cannabinoid bilayer. *NIDA Research Monograph Series*, **79**, 123-133. PMID: 2830533
 33. Siminovitch D.J., M. Ruocco, **A. Makriyannis**, R.G. Griffin, (1987), The effect of cholesterol on lipid dynamics and packing in diether phosphatidylcholine bilayers. X-ray diffraction and 2H-NMR study. *Biochim. Biophys. Acta.*, **901**, 191-200. PMID: 3607045
 34. Banijamali A., N. Abou Taleb, A. Charalambous, C.J. Van der Schyf, **A. Makriyannis**, (1988), Synthesis of deuterium labeled cannabinoids. *J. Label. Compounds*, **25**, 73-82.
 35. **Makriyannis A.**, A. Banijamali, (1988), A novel synthesis of (-)-trans-Δ^{9,11}-tetrahydrocannabinol. *J. Heterocyclic Chem.*, **25**, 823-825.
 36. Van der Schyf C.J., T. Mavromoustakos, **A. Makriyannis**, (1988), The conformation of (-) 8α and (-) 8β-hydroxy-Δ⁹-tetrahydrocannabinols and their interactions with model membranes. *Life Sci.*, **42**, 2231-2239. PMID: 2836679
 37. Abdelmageed O., D. Siminovitch, M. Ruocco, R.I. Duclos Jr., R.G. Griffin, **A. Makriyannis**, (1989), Syntheses of ²H- and ¹³C-labeled 1,2-di-O-hexadecyl-sn-glycero-3-phosphoethanolamines and 1,2-di-O-hexadecyl-sn-glycero-3-phosphocholines. *Chem. Phys. Lipids*, **50**, 163-169.
 38. Kriwacki R.W., **A. Makriyannis**, (1989), The conformational analysis of Δ⁹- and Δ^{9,11}-tetrahydrocannabinols in solution using high resolution nuclear magnetic resonance spectroscopy. *Mol. Pharmacol.*, **35**, 495-503. PMID: 2539557
 39. Lee C.W., G.S. Das, J. Mattai, G.G. Shipley, M.O. Abdel, **A. Makriyannis**, R.G. Griffin, (1989), Characterization of the L- phase in trehalose-stabilized dry membranes by solid-state NMR and X-ray diffraction. *Biochemistry*, **28**, 5000-5009. PMID: 2765521
 40. **Makriyannis A.**, A. Banijamali, H.C. Jarrell, D.P. Yang, (1989), The orientation of (-) Δ⁹-tetrahydrocannabinol in DPPC bilayers as determined from solid-state 2H-NMR. *Biochim. Biophys. Acta.*, **986**, 141-145. PMID: 2554980
 41. **Makriyannis A.**, T. Mavromoustakos, (1989), Studies on drug membrane interactions using solid state NMR, small angle X-ray diffraction and differential scanning calorimetry. *Rev. Clin. Pharmacol. Pharmacokinetics, Int. Ed.*, **3**, 95-114. PMID: 1753995
 42. Abdelmageed O.H., R.I. Duclos Jr., E. Abushanab, **A. Makriyannis**, (1990), Chiroselective syntheses of ²H- and ¹³C-labeled 1-O-alkyl-2-O-alkyl'-sn-glycero-3-phosphoethanolamines and 1-O-alkyl-2-O-alkyl'-sn-glycero-3-phosphocholines. *Chem. Phys. Lipids*, **54**(1), 49-59. PMID: 2361232
 43. **Makriyannis A.**, R.S. Rapaka, (1990), The molecular basis of cannabinoid activity. *Life. Sci.*, **47**, 2173-2184. PMID: 2266785

44. **Makriyannis A.**, D.P. Yang, R.G. Griffin, G.S. Das, (1990), The perturbation of model membranes by (-)- Δ^9 -tetrahydrocannabinol. Studies using solid-state ^2H - and ^{13}C -NMR. *Biochim. Biophys. Acta.*, **1028**(1), 31-42. PMID: 2169880
45. Mavromoustakos T.M., D.P. Yang, A. Charalambous, L.G. Herbet, **A. Makriyannis**, (1990), Study of the topography of cannabinoids in model membranes using x-ray diffraction. *Biochim. Biophys. Acta.*, **1024**(2), 336-344. PMID: 2162206
46. Melchior D.L., A. Carruthers, **A. Makriyannis**, R.I. Duclos Jr., M.O. Abdel, (1990), Alterations in red blood cell sugar transport by nanomolar concentrations of alkyl lysophospholipid. *Biochim. Biophys. Acta.*, **1028**(1), 1-8. PMID: 2207116
47. Burstein S.H., C.A. Audette, A. Charalambous, S.A. Doyle, G. Yan, S.A. Hunter, **A. Makriyannis**, (1991), Detection of cannabinoid receptors by photoaffinity labeling. *Biochem. Biophys. Res. Commun.*, **176**(1), 492-497. PMID: 1850270
48. Charalambous A., G. Marciniak, C.Y. Shiue, S.L. Dewey, D.J. Schlyer, A.P. Wolf, **A. Makriyannis**, (1991), PET studies in the primate brain and biodistribution in mice using (-)-5'- ^{18}F - Δ^8 -THC. *Pharmacol. Biochem. Behav.*, **40**(3), 503-507. PMID: 1666914
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 15. **Makriyannis A.**, (1995), The Role of Cell Membranes in Cannabinoid Activity in *Cannabinoid Receptors*, R. Pertwee, Ed., Academic Press, New York, 87-116.
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 17. Gatley S.J., N.D. Volkow, **A. Makriyannis**, (1999), Studies of the Brain Cannabinoid System Using Positron and Single-Photon Emission Tomography, in *Marihuana and Medicine*, G.G. Nahas, K.M. Sutin, S. Agurell, Eds., Humana Press, Totowa, 163-176.
 18. **Makriyannis A.**, S. Pavlopoulos, (1999), Structural Chemistry Using NMR Spectroscopy, Pharmaceuticals in: *Encyclopedia of Spectroscopy & Spectrometry*, J. Lindon, G. Tranter, J. Holmes, Eds., Academic Press, London, **3**, 2261-2271.
 19. Schuel H., M.C. Chang, L.J. Burkman, R.P. Picone, **A. Makriyannis**, A.M. Zimmerman, S. Zimmerman, (1999), Cannabinoid Receptors in Sperm in *Marihuana and Medicine*, G.G. Nahas, K.M. Sutin, S. Agurell, Eds., Humana Press, Totowa, 335-345.
 20. Palmer S.L., G.A. Thakur, **A. Makriyannis**, (2002), Cannabinergic ligands in *Chem. Phys. Lipids*, **121**(1-2), 3-19.
 21. Palmer S.L., A.D. Khanolkar, **A. Makriyannis**, (2002), Endocannabinoid Proteins and Ligands in *Biology of Marijuana: From Gene to Behavior*, E.S. Onaivi, Ed., Taylor and Francis, Inc., New York, NY, **18**, 491-522.
 22. Gatley S.J., A.N. Gifford, Y.S. Ding, R. Lan, Q. Liu, N.D. Volkow, **A. Makriyannis**, (2003), Development of PET and SPECT radioligands for cannabinoid receptors in *Drug Discovery Strategies and Methods*, **A. Makriyannis**, D. Biegel, Eds., CRC Press, New York, NY, **1**, 129-146.
 23. **Makriyannis A.**, A. Goutopoulos, (2004), Cannabinergics: Old and new therapeutic possibilities in *Drug Discovery Strategies and Methods*, **A. Makriyannis**, D. Biegel, Eds., CRC Press, New York, NY, **1**, 89-128.

24. Rapaka R., **A. Makriyannis**, V. DiMarzo, D. Piomelli, (2005), Targeted lipidomics: endocannabinoids and other endolipid modulators in *Life Sci.*, **77**(14), 1517-1518.
25. Guo J., X. Tian, S. Pavlopoulos, **A. Makriyannis**, (2006), Phospholipid bicelle membrane systems for studying drug molecules in *Handbook of Modern Magnetic Resonance*, G.A. Webb, D. Craik, Eds., Kluwer Academic Publishers, London, UK.
26. G.A. Thakur, S.P. Nikas, R.I. Duclos, **A. Makriyannis**, (2006), Methods for Synthesis of Cannabinergic Ligands in *Marijuana and Cannabinoid Research: Methods and Protocols*, E.S. Onaivi, **7**, 113-148, Humana Press, Totowa, NJ.
27. V. K. Vemuri, **A. Makriyannis**, (2009), Endocannabinoids and their Synthetic Analogs in *The Cannabinoid Receptors*, P.H. Reggio, Humana Press, Totowa, NJ.
28. S. Jiang, F. Yigong, S. Avraham, **A. Makriyannis**, H.V. Avraham, (2012), Regulation of Stem Cells by the Endocannabinoid System in *Stem Cells and Cancer Stem Cells: Therapeutic Applications in Disease and Injury*, **6** (30), 345-352. M.A. Hayat, Springer Dordrecht Heidelberg, New York, NY.
29. J.A. Hartsel, J. Eades, B. Hickory, **A. Makriyannis**, (2016), Cannabis Sativa and Hemp in *Nutraceuticals: Efficacy, Safety, and Toxicity*, 53, 735-756. R.C. Gupta, Elsevier, Inc., London, UK.
30. D.R. Janero, A. Korde, **A. Makriyannis**, (2017), Ligand-Assisted Protein Structure (LAPS): An Experimental Paradigm for Characterizing Cannabinoid- Receptor Ligand-Binding Domains in *Methods in Enzymology: Cannabinoids and their Receptors*, **593** (10), 218-232. P.H. Reggio, Elsevier Inc., London, UK.
31. D.R. Janero, K. Vemuri, **A. Makriyannis**, (2019), The Molecular Basis of Cannabinoid Activity: Application to Therapeutics Design and Discovery for Cannabis Use Disorders in *Cannabis Use Disorders*, 43-55. I.D. Montoya, S.R.B. Weiss, Springer Nature, Cham, Switzerland.

REVIEWS:

1. Mavromoustakos T., **A. Makriyannis**, (1993), The use of molecular graphics as an aid in the study of the conformational properties of biologically active molecules. *Rev. Clin. Pharmacol.*, **11**, 88-89.
2. Malan Jr. T.P., M.M. Ibrahim Jr., J. Lai, T.W. Vanderah, **A. Makriyannis**, F. Porreca, (2003), CB2 cannabinoid receptor agonists: Pain relief without psychoactive effects? *Curr. Opin. Pharmacol.*, **3**(1), 62-67. PMID: 12550743
3. Thakur G.A., S.P. Nikas, **A. Makriyannis**, (2005), CB1 cannabinoid receptor ligands. *Mini Rev. Med. Chem.*, **5**(7), 631-640. PMID: 16026309
4. Thakur G.A., S.P. Nikas, C. Li, **A. Makriyannis**, (2005), Structural requirements for cannabinoid receptor probes. *Handbook of Experimental Pharmacology*, (168), 209-246. PMID: 16596776
5. Lu D., V.K. Vemuri, R.I. Duclos Jr., **A. Makriyannis**, (2006), The cannabinergic system as a target for anti-inflammatory therapies. *Current Topics in Medicinal Chemistry*, **6**(13), 1401-1426. PMID: 16918457
6. Pavlopoulos S., G.A. Thakur, S.P. Nikas, **A. Makriyannis**, (2006), Cannabinoid receptors as therapeutic targets. *Curr. Pharm. Des.*, **12**(14), 1751-1769.
7. Thakur G.A., S.P. Nikas, R.I. Duclos Jr., **A. Makriyannis**, (2006), Methods for the synthesis of cannabinergic ligands. *Methods Mol. Med.*, **123**, 113-148.
8. Janero D.R., **A. Makriyannis**, (2009), Cannabinoid receptor antagonists: Pharmacological opportunities, clinical experience, and translational prognosis. *Expert Opin. Emerg. Drugs*, **14**(1), 43-65. PMID: 19249987

9. Janero D.R., S.K. Vadivel, **A. Makriyannis**, (2009), Pharmacotherapeutic modulation of the endocannabinoid signaling system in psychiatric disorders: Drug-discovery strategies. *Int. J. Psychiatry*, **21**(2), 122-133. PMID: 19367506
10. Kunos G., D. Osei-Hyiaman, S. Bátkai, K.A. Sharkey, **A. Makriyannis**, (2009), Should peripheral CB(1) cannabinoid receptors be selectively targeted for therapeutic gain? *Trends Pharmacol. Sci.*, **30**(1), 1-7. PMID: 19042036

ACTIVE RESEARCH FUNDING:

FEDERAL GRANTS (Active)

P01 DA009158 **(PI)** *Endocannabinoid Active Sites as Therapeutic Targets (9/30/94-6/30/20)*

R13 DA040423 **(PI)** *Chemistry and Pharmacology of Drugs of Abuse Symposium (7/15/15-6/30/20)*

R01 DA041435 **(PI)** *Structure Function of CB1 Cannabinoid Receptor (9/15/16-6/30/21)*

R01 DA040537 **(PI)** *Nano-delivery of methanandamide across BBB to block cannabinoid induced effects in HIV-1 infection (8/1/16-7/31/20)*

R01 DA045020 **(PI)** *Structure and Function of CB2 Receptor (9/30/17-8/31/22)*

P01 DA041307 **(PI)** *New Modalities for the Tx of Pain & Drug Abuse: Proj 3 CB1/CB2 Cannabinoid Ligands for HIV Neuropathic Pain (5/1/17-4/30/22)*

R01 DA003801 **(PI)** *Molecular Basis of Cannabinoid Activity, including supplements (4/1/92-2/28/20)*

R01 DA043700 **(PI)** *Behavioral Pharmacology for Synthetic Cannabinoids(9/30/18-6/30/23)*

NU-DFCI Cancer Act **(PI)** *Targeting Inflammation in Mouse and Human Models of Triple Negative Breast Cancers by Inhibition of MGL (8/1/18-10/30/20)*

R01 DK119498 **(PI)** *Gut-brain endocannabinoid signaling in feeding behavior and obesity (7/1/19-6/30/24)*

FOUNDATION GRANTS

Klarman Foundation, *Cannabinoid Medications for Anorexia Nervosa (6/1/14-2/28/17)*

Alzheimer's Drug Discovery Foundation, *Fatty Acid Amide Hydrolase Inhibitors as AD Medications (9/1/15-12/31/2017)*

INDUSTRIAL GRANTS

Endo Pharmaceuticals, *CB2 Selective Agonists*

Glaxo Wellcome, *Design and Synthesis of Antineoplastic Alkyl Lysophospholipids*

Glaxo Wellcome, *Antineoplastic Ether Lipids Molecular Mechanisms of Action*

WHO, *World Health Organization Research Award*

Pfizer Central Research, *Development of Porcine Somatotropin Receptor Binding Assays*

INVITED LECTURES SINCE 1998:

Last Updated 2/10/2020

- 1998 American Assoc. of Pharma. Scientists' Eastern Regional Meeting, Parsippany, NJ (**Keynote**)
 Regional American Chemical Society Meeting, Middlebury, CT (**Keynote**)
 Boston University, School of Medicine, Boston, MA
 Virginia Commonwealth University NIDA Seminar Series, Richmond, VA
 National Neuroscience Meeting, Los Angeles, CA
 Fudan University, Shanghai, China
 College of Pharmacy, Second Military Medical University, Shanghai, China
 Shanghai Institute of Organic Chemistry, Chinese Academy of Science, China
 Institute of Materia Medica- Chinese Academy of Medicine, Shanghai, China
 Qing Hua University, Shanghai, China
 International Cannabinoid Research Society, Palais des Congres, La Grande Motte, France
- 1999 University of Cyprus, Nicosia, Cyprus
 Boston University, School of Medicine, Boston, MA
 8th Cyprus Conference on New Methods in Drug Research, Limassol, Cyprus
 American Association of Pharmaceutical Scientists Annual Meeting, New Orleans, LA
 FASEB Summer Research Conference, Copper Mountain, CO
 2nd Annual BEACON SYMPOSIUM Drug Discovery, Design and Delivery Symposium (**Keynote**)
 NIDA IRP Special Seminar, Bethesda, MD
 American Chemical Society Regional Meeting, Boston, MA
 University of Connecticut Health Center, Farmington, CT
 Harvard Medical School-McLean Hospital, Belmont, MA
- 2000 RBI Sigma, Natick, MA
 American Chemical Society National Meeting, San Francisco, CA
 Yale Psychosis Research Seminar Series, New Haven, CT
 University of Connecticut Health Center, Farmington, CT
 University of Connecticut, Physiology and Neurobiology, Storrs, CT
 Synaptic Pharmaceutical Corporation, Paramus, NJ
 New Perspectives in the Therapeutic Uses of Endocannabinoids, Madrid, Spain
 University of Minnesota, Minneapolis, MN
 University of Connecticut, School of Pharmacy All-School Seminar Series, Storrs, CT
 Pacificchem Joint American and Japanese Chemical Society 2000 Conference, Honolulu, HI
- 2001 Harvard Medical School-McLean Hospital, Belmont, MA
 Wayne State University, Detroit, MI
 University of Connecticut Chemistry Colloquium, Storrs, CT
 Abbott Laboratories, Chicago, IL
 American Chemical Society National Meeting, Chicago, IL
 NIDA Symposium on Cannabinoids: Chemistry and Biology Meeting, Bethesda, MD
 AstraZeneca R&D, Montreal, Canada
- 2002 National Institute of Mental Health, Bethesda, MD
 Purdue University, Indianapolis, IN
 University of Louisville, Louisville, KY
 NIDA Symposium on Structural Biology & Structural Genomics/Proteomics, Bethesda, MD
 International Behavioral Neuroscience Society 11th Annual Meeting, Capri, Italy
 International Symposium on Medicinal Chemistry, Barcelona, Spain
 Scientific Seminar Series at the University of Connecticut, Groton, CT
 Mini-Symposium on Current Trends in Drug Abuse Research, Storrs, CT (**Keynote**)
 American Association of Pharmaceutical Scientists Annual Meeting, Toronto, Ontario, Canada
 Marine Sciences, University of Connecticut, Groton, CT

Center for Genetics and Molecular Medicine, University of Louisville, Louisville, KY

- 2003 National Institute on Drug Abuse, Rockville, MD
 Northeastern University, Boston, MA
 University of Connecticut School of Pharmacy Advisory Board, Storrs, CT
 American Society for Pharmacology and Experimental Therapeutics, San Diego, CA
 Crompton Corporation Chapter of Sigma Xi, Middlebury, CT **(Keynote)**
 NIDA's Southern Africa Initiative, Cape Town, South Africa
 Center for Vascular Biology, University of Connecticut Health Center, Farmington, CT
 National Hellenic Research Foundation, Athens, Greece **(Keynote)**
 4th International Symposium on Pharmaceutical Chemistry, Istanbul, Turkey
 Institute of Living Neuroscience Rounds, Hartford, CT
- 2004 Virginia Commonwealth University, Richmond, VA
 Signaling Lipids and Drugs of Abuse for the National Institute on Drug Abuse, Washington, D.C.
 NIDA on Medications Development for Cannabis Dependence, Rockville, MD
 National Institute on Drug Abuse and the American Psychiatric Association, New York, NY
 10th Cyprus Conference on New Methods in Drug Research, Limassol, Cyprus
 Meeting for the College on Problems of Drug Dependence (CPDD), San Juan, Puerto Rico
 International Cannabinoid Research Society (ICRS) Satellite Meeting, Paestum, Italy
 CMCR Conference: Future Directions in Cannabinoid Therapeutics, Paestum, Italy
 American Chemical Society National Meeting, Philadelphia, PA
 AAPS-NIDA Symposium, Bethesda, MD
 Northeastern University, Boston, MA
 Northeastern University, Massachusetts Council of Biotechnology, Boston, MA **(Keynote)**
 1st Hellenic Symposium ORGANIC SYNTHESIS, U. of Athens, Greece **(Keynote)**
 Institute of Montreal Pfizer Lecture Series, Montreal, Canada
 NIDA for the American College of Neuropsychopharmacology, San Juan, Puerto Rico
- 2005 Symposium Chair for the Center for Drug Discovery and Northeastern University, Boston, MA
 Provost's Innovations in Research, Northeastern University, Boston, MA
 Washington University, St. Louis, MO
 15th Noordwijkerhout-Camerino Symposium, Amsterdam, Netherlands
 Boehringer-Ingelheim Pharmaceutical, Ridgefield, CT
 XV Annual International Cannabinoid Research Society Symposium, Clearwater, FL
 Moderator for AAPS National Biotechnology Conference, San Francisco, CA
 NIDA SPIRDAP Special Emphasis Panel, Bethesda, MD
 Columbia University, Department of Medicine and Sanofi-Aventis, New York, NY
 Panel Moderator and Presenter, ACNP Annual Meeting, Waikoloa, HI
- 2006 NIDA, Bethesda, MD
 ICRS 16th Annual Symposium on the Cannabinoids, Tihany, Hungary
 GRASP, Northeastern University, Boston, MA **(Keynote)**
 SBIR, Governor's Office of Workforce Competitiveness, East Hartford, CT **(Keynote)**
- 2007 10th IBN Sina International Conference on Pure and Applied Heterocyclic Chemistry, Luxor, Egypt
 The Threat of Obesity, Northeastern University, Boston, MA **(Keynote)**
 Kenneth E. Avis Distinguished Visiting Professor Lecture, Memphis, TN **(Keynote)**
 ASPET, Washington, D.C.
 Camerino Lectures, Camerino, Italy
 NU Today Event, Northeastern University, Boston, MA
 American Chemical Society National Meeting, Boston, MA

NIDA/NIH, Rockville, MD
 ECSN Scientific Forum, Boca Raton, FL

- 2008 Medications Development for Treatment of Cannabis-Related Disorders, NIDA/NIH, Bethesda, MD
 National Hellenic Research Foundation, Athens, Greece **(Keynote)**
 235th ACS Spring National Meeting and Burger Award, New Orleans, LA
 American Society of Addiction Medicine, Toronto, Canada
 11th Cyprus Conference on “New Methods in Drug Research”, Limassol, Cyprus
 NU Board of Trustees Annual Corporation Faculty Symposium, Boston, MA **(Keynote)**
- 2009 University of Hawaii, Honolulu, HI
 Northeastern University Pharmaceutical Sciences Showcase, Boston, MA **(Keynote)**
 Northeastern University Chemistry and Chemical Biology Retreat, Boston, MA
 National Institute of Health, Bethesda, MD
 The College on Problems of Drug Dependence Special Symposium, Reno, NV
 American Association of Colleges of Pharmacy, Boston, MA
 Gordon Research Conference: Cannabinoid Function in the CNS, Biddeford, ME
 Biogen Idec, Cambridge, MA
- 2010 Northeastern University, Special Topics in Chemistry, Boston, MA
 COST Chemistry: Free Radicals in Chemical Biology, Athens, Greece **(Keynote)**
 Alnylam Biotherapeutics, Cambridge, MA, March 2010
 28th Camerino-Cyprus-Noordwijkerhout Symposium, Camerino, Italy
 International Narcotics Research Conference, Malmö, Sweden
 Beijing Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing, China
 International Symposium, Nanjing University, Nanjing, China **(Keynote)**
 Shanghai Institute of Materia Medica, Chinese Academy of Sciences, Shanghai, China
 Fudan University, School of Pharmacy, Shanghai, China
 Shanghai Institute of Organic Chemistry, Shanghai, China
 Behavior, Biology, and Chemistry: Translational Research in Addiction, San Antonio, TX **(Keynote)**
- 2011 The Royal Danish Academy of Sciences and Letters, Copenhagen, Denmark
 Philip S. Portoghese Symposium, University of Minnesota, Minneapolis, MN
 Drug Discovery, Delivery & Development, Northeastern University, Boston, MA
 12th Cyprus Conference on “New Methods in Drug Research”, Limassol, Cyprus
 NIDA Training Grant Symposium, University of Kentucky, Lexington, KY
 Northeastern University Pharmcal Sciences Research Showcase, Boston, MA
 Behavior, Biology, and Chemistry: Translational Research in Addiction Conference, San Antonio, TX
 Brigham and Women’s Hospital Presentation, Harvard University, Cambridge, MA
- 2012 Department of Pharmaceutical Sciences Seiminar, University of Pittsburgh, Pittsburgh, PA
 18th Society on Neuroimmune Pharmacology Scientific Conference, Honolulu, HI
 33rd National Medicinal Chemistry Symposium, University of Arizona, Tuscon, AZ
 Arcade Conference on Chemistry for Health, Athens, Greece
 The Foundation for Research and Technology- Hellas 30th Anniversary Celebration, Heraklion, Crete
 Northeastern University Honors Special Topics in Health Care, Boston, MA
 Northeastern University PRISM Lecture Series, Boston, MA
- 2013 Northeastern University Biophysical Methods in Drug Design, Boston, MA
 Northeastern University Understanding Design Special Lectures Series, Boston, MA
 University of Hawaii, Manoa Drug Design and Discovery, Honolulu, HI
 TRP Colloquium, National Institute on Drug Abuse, Washington D.C.

Spice Colloquium, National Institute on Drug Abuse, Washington D.C.

- 2014 Northeastern University Biophysical Methods in Drug Design, Boston, MA
 RTI, Durham, NC
 Department of Medicinal Chemistry, Virginia Commonwealth University, Richmond, VA
 McLean Hospital, Boston, MA
 34th National Medicinal Chemistry Symposium, Charleston, SC
 Medical Cannabis Symposium, Connecticut Pharmacists Association, Plantsville, CT **(Keynote)**
 SupplySide West Conference, Las Vegas, NV
 University of Hawaii, Manoa, Honolulu, HI
 Beijing Biomedicine Summit, Beijing Biomedicine Forum, Beijing, China **(Keynote)**
- 2015 Northeastern University Biophysical Methods in Drug Design, Boston, MA
 Northeastern University, Alumni Center Reception, Boston, MA
 Beijing Biomedical Conference, Beijing, China **(Keynote)**
 King Abdulaziz University, Jeddah, Saudi Arabia
 Scientific Memorial, Dr. Steven Goldberg, NIDA Intramural Research Program, Baltimore, MD
 ANPA Meeting, Orlando, FL
 Hikewell Institute, Beijing, China **(Keynote)**
 Nanjing University, Nanjing, China
 University of Hawaii, Honolulu, HI
 College on Problems of Drug Dependence, Phoenix, AZ
 Northeastern University, New Provost Bear Orientation, Boston, MA
 Northeastern University, Honors Special Topics in Healthcare, Boston, MA
 King Faisal University, Al Ahsa, Saudi Arabia
 International GPCR Meeting, iHuman Institute and ShanghaiTech University, Suzhou, China **(Keynote)**
- 2016 Keystone Symposia on Molecular and Cellular Biology. Keystone, CO
 AOCS Annual Meeting and Expo, Salt Lake City, UT **(Keynote)**
 MassBio Formulations and Drug Discovery Forum, Cambridge, MA **(Keynote)**
 Pain Mechanism and Therapeutics Conference, Taormina, Sicily
 P30 CDAR EAB Meeting, Pittsburgh, PA **(Keynote)**
 17th Annual ADDF Meeting, Jersey City, NJ
- 2017 Applied Pharmaceutical Chemistry 2017 at The Broad Institute, Cambridge, MA
 CannMed 2017 Conference, Harvard Medical School, Cambridge, MA
 ASPET Annual Meeting at Experimental Biology 2017, Chicago, IL
 Institute of Cannabis Research Conference, Pueblo, CO **(Keynote)**
 UCONN Seminar Series, Storrs, CT
 ICRS 2017, Montreal, QC Canada
 2017 Drugs of Abuse Conference, Boston, MA **(Keynote)**
 American Chemical Society Symposium of the MEDI Division, Bethesda, MD
 ADDF 18th International Conference on Alzheimer's Drug Discovery, Jersey City, NJ
 Boston Veteran Affairs (VA) Healthcare System seminar Series, Boston, MA **(Keynote)**
 4th Annual Personalized NanoMedicine 2017, Miami, FL
- 2018 Mount Sinai Pharmacological Sciences Seminar Series, New York, NY
 Pain Mechanisms and Therapeutics Conference, Taormina, Sicily Italy
 The College on Problems of Drug Dependence, INC. 80th Annual Scientific Meeting, San Diego, CA
 256th American Chemical Society Meeting and Exposition, Boston, MA **(Keynote)**
 Johns Hopkins University Department of Psychiatry and Behavioral Sciences, Baltimore, MD

Novel Analgesic Drug Discovery Summit 2018, Boston, MA
 24th Biotechnology Congress: Research & Innovations, Boston, MA
 British Pharmacological Society- Molecular Pharmacology of GPCRs Meeting, Parkville, Australia

2019 NECANN Boston, Boston, MA
 Wertheim Lectureship Series, Miami, FL
 University of Arizona Minisymposium on Neurobiology, Tucson, AZ
 12th Chicago Symposium on Translational Neuroscience, Chicago, IL
 8th WHBA Summer School in Medical and Bio-sciences Research, Mani, Greece (**Keynote**)
 ICRS 2019, Bethesda, MD (**Keynote**)
 International Cannabinoid Derived Pharmaceuticals Summit, Boston, MA
 Conference on Bioactive Lipids in Cancer, Inflammation, and Related Diseases, St. Petersburg, FL
 Drug Discovery Meeting 2019, Boston, MA

MENTORING ACTIVITIES:

Graduate, Post-Doctoral Students, and Visiting Scholars Directly Advised Since 2000 (University of Connecticut and Northeastern University, partial list)

- | | |
|-------------------------------------------------------------|----------------------------------------------------------------------------|
| 1. X. Tian, Ph.D., 1993-2004; Postdoctoral, 2004-2011. | 27. Y.C. Leung, Postdoctoral, 2001-2004. |
| 2. D. Lu, Ph.D., 1994-2005; Postdoctoral, 2005-2006. | 28. P. McLaughlin, Postdoctoral, 2001-2005. |
| 3. H.F. Deng, M.Sc., Ph.D., 1995-2000 | 29. J. Anday, Ph.D., 2001-2006. |
| 4. R. Picone, Ph.D., 1995-2001;
Postdoctoral, 2002-2004. | 30. K. Winston, Ph.D., 2001-2006. |
| 5. T. Kourouli, Visiting Scholar (Greece),
1996-2001. | 31. S. Filppula, Postdoctoral, 2001-2006. |
| 6. X.Z. Lai, Ph.D., 1996-2004. | 32. S. Yaddanapudi, Ph.D., 2001-2007. |
| 7. J. Guo, Ph.D., 1996-2003; Postdoctoral,
2004-2003. | 33. P. Fan, Visiting Scholar (China), 2001-
2007; 2009-2010; 2011-2014. |
| 8. Q. Liu, M.Sc., 1996-2002. | 34. L. Pandarinathan, Postdoctoral, 2002-
2003. |
| 9. R. Chari, Ph.D., 1998-2005. | 35. G. Choi, Postdoctoral, 2002-2004. |
| 10. A. Ramamurthy, M.Sc., 1998-2001. | 36. J. Zhao, M.Sc., 2002-2005. |
| 11. A.K. Singh, M.Sc., 1999-2001. | 37. Y. Pei, Ph.D., 2002-2007. |
| 12. S. Palmer, Postdoctoral, 1999-2002. | 38. D. Kazolias, M.Sc., 2002-2005. |
| 13. M. Sommer, Postdoctoral, 1999-2000. | 39. C. Rajan, M.Sc., 2002-2005. |
| 14. C. Souli, Postdoctoral, 1999-2000. | 40. J. Wood, Postdoctoral, 2002-2005. |
| 15. F.M. Yao, Postdoctoral, 1999-2001. | 41. S. Varadarajan, Postdoctoral, 2003-2004. |
| 16. Y. Zhuang, Postdoctoral, 1999-2001. | 42. L. Bizeta, Postdoctoral, 2003-2004. |
| 17. A. Zvonok, Postdoctoral, 1999-2002. | 43. V. Veerappan, Postdoctoral, 2003-2004. |
| 18. S. Nikas, Postdoctoral, 1999-2003. | 44. T. Olszewska, Postdoctoral, 2003-2005. |
| 19. R. Mercier, Postdoctoral, 2000-2006. | 45. K.V. Subramanian, Postdoctoral, 2003-
2005. |
| 20. T. Neelands, Postdoctoral, 2000-2001. | 46. J. Zhang, M.Sc., 2003-2006. |
| 21. H. Hu, Postdoctoral, 2000-2001. | 47. D. Fortin, Ph.D., 2003-2006. |
| 22. G. Thakur, Postdoctoral, 2000-2003. | 48. Y. Peng, M.Sc., 2003-2007; 2008-2009. |
| 23. W. Xu, Ph.D., 2000-2006. | 49. C. Haile, Postdoctoral, 2004-2005. |
| 24. C. Li, M.Sc., 2001-2004. | 50. J. Williams, Ph.D., 2004-2007. |
| 25. C.R. Ramanathan, Postdoctoral, 2001-
2004. | 51. K.R. Vemuri, Postdoctoral, 2004-2007. |
| 26. R. Thotapally, Postdoctoral, 2001-2004. | 52. O.S. Alapafuja, Ph.D., 2004-2009. |
| | 53. J. Zhai, Postdoctoral, 2005-2006. |
| | 54. P. Holmberg, Postdoctoral, 2005-2006. |
| | 55. E. Jutkiewicz, Postdoctoral, 2005-2006. |

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56. K. Dzenko, Postdoctoral, 2005-2006.
57. D. Karanian, Postdoctoral, 2005-2007.
58. S. Divakaramenon, Postdoctoral, 2005-2007.
59. T. Parkkari, Visiting Scholar (Finland), 2005-2007.
60. V. Magriotti, Visiting Scholar (Greece), 2006.
61. P. Salgaonkar, Postdoctoral, 2006-2007.
62. X. Han, Visiting Scholar (China), 2006-2007.
63. P.W. Qin, M.Sc., 2006-2008.
64. A. Kastal, M.Sc., 2006-2009.
65. J. Zhuang, Postdoctoral, 2006-2009.
66. R. Sharma, Ph.D., 2006-2011.
67. M. Johnston, Ph.D., 2006-2011.
68. I. Karageorgos, Ph.D., 2006-2011.
69. E. Shelnut, Ph.D., 2006-2011.
70. D. Szymanski, Ph.D., 2006-2011.
71. W. Aizu, Postdoctoral, 2006-2007.
72. L. Song, Postdoctoral, 2006-2007.
73. V. Shukla, Postdoctoral, 2006-2009.
74. H. Teng, Ph.D., 2006-2011.
75. D. Anagnostopoulos, Visiting Scholar (Greece), 2007.
76. F. Desarnaud, Postdoctoral, 2007.
77. H. Jang, Postdoctoral, 2007.
78. S. Tyukhtenko, Postdoctoral, 2007-2010.
79. C. Freni, M.Sc., 2007-2008.
80. C. Kearn, Postdoctoral, 2007-2008.
81. S. Gopalakrishnan, M.Sc., 2007-2008.
82. S. Cararas, Postdoctoral, 2007-2008.
83. A. Bowman, Postdoctoral, 2007-2009.
84. I. Kendrick, Ph.D., 2007-2011.
85. M. Papanastasiou, Postdoctoral, 2007-2010.
86. P. LeBeaume, Ph.D., 2007-2010.
87. M. D'Souza, Ph.D., 2007-2011.
88. S. Bajaj, Ph.D., 2007-2012.
89. S. Tai, Ph.D., 2007-2012.
90. P. Yin, Ph.D., 2007.
91. H. Zhou, Ph.D., 2007-2014, Postdoc 2014-2016.
92. H. Li, Postdoctoral, 2007-2009.
93. R. Serbanescu, M.Sc., 2008-2010.
94. R. Tichkule, Ph.D., 2008-2012.
95. M. Nasr, Ph.D., 2008-2012.
96. K. Whitten, Ph.D., 2008-2012.
97. C. Sallum, Postdoctoral, 2008-2009.
98. D. Smith, Postdoctoral, 2008-2010.
99. A. Rafalko, Ph.D., 2008-2011.
100. S. Sanghavi, M.Sc., 2008-2009.
101. S. Marathe, M.Sc., 2008-2009.
102. V. Kodumuru, Postdoctoral, 2008-2010.
103. S. Bhatt, M.Sc., 2009-2010.
104. M. Johnson, Ph.D., 2009-2014.
105. S.H. Chalasani, M.Sc., 2009-2010.
106. B. Patel, M.Sc., 2009-2010.
107. C. Mushti, Postdoctoral, 2009-2010.
108. D. Finnegan, Postdoctoral, 2009-2011.
109. K. Melchior, Postdoctoral, 2009-2010.
110. J. West, Postdoctoral, 2009-2013.
111. F. Sekyere, Ph.D., 2010.
112. Y. Jmeian, Postdoctoral, 2010.
113. A. Kulkarni, M.Sc., 2010-2011.
114. L. Shen, Postdoctoral, 2010-2011.
115. B. Zhang, Postdoctoral, 2010-2011.
116. J. Garcia, Postdoctoral, 2010-2013.
117. C. Habrukowich, Postdoctoral, 2010-2014.
118. S. Ganguly, M.Sc., 2010-2011.
119. G. Rajarshi, Ph.D., 2010-2017.
120. D. DeFilippo, M.Sc., 2011-2012.
121. Y. Liu, Postdoctoral, 2011-2015.
122. M. Williams, Postdoctoral 2011-2014.
123. A. Korde, Ph.D., 2011-2017.
124. M. Silva, Ph.D., 2012-2013.
125. M. Baradwan, Ph.D. Candidate, 2012-.
126. D. Felsing, Ph.D., 2012-2016.
127. C. Honrao, Ph.D. Candidate, 2012-.
128. S. Kulkarni, Ph.D. Candidate, 2012-.
129. S. Mallipeddi, Ph.D. Candidate, 2012-2016.
130. C. Miyabe, Ph.D. Candidate, 2012-.
131. W. Zhang, M.Sc., 2012-2014; PhD. Candidate, 2014-2017.
132. D. Pelekoudas, M.Sc., 2013-2015; PhD. Candidate, 2015-.
133. P. Raje, M.Sc., 2013-2014.
134. W. Zhu, M.Sc., 2013-2014.
135. S. Jiang, Ph.D. Candidate, 2013-.
136. B. Kochert, Ph.D. Candidate, 2013-.
137. C. Perry, Ph.D. Candidate 2013-.
138. B. Peng, M.Sc., 2013-2014; Ph.D. Candidate 2014-.
139. M. McCormack, Postdoctoral, 2013-2015.
140. B. Suchomel, M.Sc., 2014.
141. B. Wong, M.Sc., 2014.
142. W. Wang, M.Sc., 2014-2015.
143. Y. Liu, Ph.D. Candidate, 2014-.
144. K. Mohammad, Ph.D. Candidate, 2014-.
145. X. Ma, M.Sc., 2014; Ph.D. Candidate, 2015-.
146. J. Raghav, M.Sc. 2013-2014; Ph.D. Candidate, 2014-.

147. X. Sun, Ph.D. Candidate, 2014-.
148. O. Benchama, Ph.D. Candidate, 2017-.
149. A. Casey, Ph.D. Candidate, 2016-.
150. X. Chen, M.Sc. Candidate, 2017-.
151. S. Farah, Ph.D. Candidate, 2017-.
152. L. Fleischer, Ph.D. Candidate, 2015-.
153. C. Iliopoulos-Tsoutsouvas, Ph.D. Candidate, 2016-.
154. L. Ji, , Ph.D. Candidate, 2013-.
155. M. Kassu, Ph.D. Candidate
156. Yu, Tianqi, Ph.D. Candidate, 2012-.

MINORITY ACTIVITIES:

Majority-Minority Interactive Research Program; Collaboration between the University of Connecticut, Florida A&M University; Special Summer Internship Program; NIDA Sponsored Collaboration with North Carolina A&T University (NCAT); Member, External Scientific Advisory Committee of the Minority Biomedical Research Program at NIH, Florida A&M; NIH Special Populations Research Development Effort

MINORITY INDIVIDUALS ADVISED SINCE 2000:

Student	University Attended	Dates Sponsored
Mufeed Basti	North Carolina A&T Associate Professor	Summers 2000, 2001, 2003, 2004
Carl Engmann	University of Connecticut Undergraduate Student	Summer 2000
Sonya Palmer	University of Connecticut Post Doctoral Fellow	2000-2003
Keisha Winston	University of Connecticut Graduate Student	2001-2005
Jenine Anday	University of Connecticut Graduate Student	2001-2007
Shakiru Alapafuja	Northeastern University Doctoral Student	2006-2008
Sherrica Tai	Northeastern University Graduate Student	2007-2011
Elvis Tiburu	Northeastern University Assistant Research Professor	2007-2013
Joseph Allen	Northeastern University Undergraduate Student	2009-2014
Jessica Garcia	Northeastern University Post Doctoral Fellow	2010-2013
Christina Miyabe	Northeastern University Graduate Student	2012-
Murillo Silva	Northeastern University Graduate Student	2012-2013
Othman Benchama	Northeastern University Graduate Student	2017-