# CURRICULUM VITAE

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# ACADEMIC BACKGROUND

1987 Ph.D., in Neuropharmacology, University of Bradford, England 1985 M.Sc., in Pharmacology, University of Bradford, England

1978 B. Pharm., (Hons), University of Benin, Nigeria

# PROFESSIONAL EXPERIENCE

2020--present Director, William Paterson University (WPU) Animal Research Laboratory 2020--present Chairman WPU, Institutional Animal Care and Use Committee

2022--present NIH- ZRG1 BN-R 86 reviewer

2022--present William University Faculty Senator

2013--2014 Fulbright Scholar, Addis Ababa University, Addis Ababa, Ethiopia 2014--present Honorary Professor, Addis Ababa University, Addis Ababa, Ethiopia

2013--2013 Reviewer for German-Israel Foundation for Scienctific Research and development 2012--2012 NIH-NPAS Grant reviewer

2011--present Professor of Biology, WPU, and Wayne, New Jersey 2011--2011 AAAS-Grant reviewer

2009--present Professor, WEB DuBois Institute, Princeton University, Princeton, New Jersey 2009--2009 Chairman WPU University Range Adjustment Committee

2007--2011 Associate Professor, WPU, and Wayne, New Jersey 2000--2007 Assistant Professor, WPU, and Wayne, New Jersey

2000--2001 Associate Research Professor, Psychiatry and Pharmacology, Vanderbilt, University, Nashville, TN

2000--present Guest Researcher, NIDA-National Institutes of Health, Baltimore, MD 1996--2000 Assistant Research Professor, Psychiatry and Pharmacology, Vanderbilt,

University, Nashville, TN

1995--1996 Adjunct Assistant Research Professor, Psychiatry and Pharmacology, Vanderbilt, University, Nashville, TN

1992--1996 Assistant Professor Pharmacology, Meharry Medical College, Nashville, TN 1990--1992 Visiting Research Scientist, Department of Anesthesiology, Stanford University

School of Medicine and MRI, Palo Alto, California

1989--1990 Research Instructor, Laboratory of Neuroscience, Pennington Biomedical Research Center, Baton Rouge, Louisiana

1987--1989 Postdoctoral Fellow, Department of Pharmacology, Medical College of Virginia, Richmond, Virginia

# AWARDS AND HONORS

2021 William Paterson University Award - Excellence in Scholarship

2015 William Paterson University Award - Excellence in Scholarship

2007 William Paterson University Award - Excellence in Scholarship 2013 Fulbright Scholar Award for Sabbatical at AAU in Ethiopia

2007 William Paterson University Award for Excellence in Scholarship

2004 Council on Undergraduate Research selection and presentation in Capitol Hill before United States Congress

1997 International Brain Research Organization travel award

1994 American College of Neuropsychopharmacology travel award 1993 American College of Neuropsychopharmacology travel award

1989 Biochemical Pharmacology Honorarium as Co-author of “Nature of mecamylamine’s antagonism of the central effects of nicotine”.

1988 College on problems of drug dependence travel awardee

1987 European Neuroscience Association Fellow-Autumn School, Santa Margurita, Italy 1987 European Neuroscience Association Fellow-Winter School, Zuoz, Switzerland

# FEDERAL AND OTHER RESEARCH SUPPORT

2020--2023 NIAAA Grant R15AA027909: “Neuroimmune behavioral effects of CB2 cannabinoid receptors” (PI, E.S. Onaivi)

2012--2016 NIDA Grant R15DA32890: “Behavioral effects of CB2 cannabinoid receptors (CB2Rs)” (PI, E.S. Onaivi)

2013--2014 Fulbright Scholarship Award (PI, E.S. Onaivi)

2003--2009 WPU SURP “Neurobiology of cannabinoid receptors” (PI, E.S. Onaivi)

2001--2001 NIDA Intramural Contract #263-MI-107518 “Cannabinoid project” (PI, E.S. Onaivi) 2001--2001 NIDA Professional Service Contract #263-MI-216718 “Role of endocannabinoids in

the behavioral and central effects of cocaine” (PI, E.S. Onaivi) 2000--2000 WPU Intra-Mural Funds, Laboratory setup (PI, E.S. Onaivi) 1998--2001 Institute for Coffee Studies: (PI, P. Martin)

1995--2000 NHLBI K01 Award: “The role of the CNS in the cardiovascular effects of cocaine” (PI, E.S. Onaivi)

1995--1998 NIMH Supplemental award: “Psychopharmacology: Beta adrenoceptor regulation in brain” (PI, F. Sulser)

1995--1998 NSF Grant: “Regulation of neuronal differentiation by polyamines” (Co-PI, E. S. Onaivi)

1995--1998 NHLBI-Minority Institutional Training Award (PI, Townsel)

1995--1995 Meharry-Oak Ridge National Laboratory Project. “Analysis of mutant mice” (Co-PI,

E.S. Onaivi)

1994--1996 EPA-Minority Academic Institutions: Training Program in Pharmacology and Toxicology (PI, E.S. Onaivi)

1993--1993 NSF-MRCE Grant Award: “Neurobiology of bound dopamine transporter” PI, (E.S. Onaivi)

1993--1993 NSF-MRCE Seed Grant Award: “Regulation of membrane bound dopamine transporter” PI, (E.S. Onaivi)

1990--1993 US Army Research and Development Command. DMDD-17-88-Z-8023 to Pennington Biomedical Research Center (Investigator, E.S.Onaivi)

1990--1992 Stanley Foundation Research Award. National Alliance for the mentally ill.

Research award in schizophrenia

1991--1991 Syntex: “Analysis of Syntex anxiolytic compounds” (E.S.Onaivi) 1991--1991 Searle: “Analysis of Searle anxiolytic compounds” (E.S.Onaivi)

1990--1991 MRI Research Award: Visiting Research Scientist, Stanford University.

**Global Patent Filed and on Pause:** Liu QR, Onaivi ES inventor; WILLIAM PATERSON UNIVERSITY: United States., assignee. Floxed mouse line of cannabinoid receptor 2 (*Cnr2*) gene site-specific recombination as an animal model for medicinal marijuana development. USA 2017. Provisional Patent Application on Transgenic Mice #62/121,227, 3/12/2015.

# EDITORIAL WORK

**CHIEF…Editor**

*Advances in Drug and Alcohol Research 2021-*

# EDITORIAL BOARDS

Current Pharmaceutical Design

American Journal of Endocannabinoid Medicine Tropical Journal of Pharmaceutical Research Journal of Drug and Alcohol Research Cannabinoid Receptors – Drug Times

Pharmaceuticals Special issue: Medical marijuana – MDPI Special editor Frontiers in Molecular Neuroscience

# Memberships – Scientific Societies

* Society for Neuroscience (SFN)
* College on Problems of Drug Dependency (CPDD)
* International Behavioral Neuroscience Society (IBNS)
* Society for Experimental Biology and Medicine(SEBM)
* Curriculum on Undergraduate Education(CUR)
* International Drug Abuse Research Society (IDARS)
* International Cannabinoid Research Society (ICRS)
* International Behavioral and Neural Genetics Society(IBNS)
* International Brain Research Organization(IBRO)
* International Association for Cannabinoids as Medicine(IACM)

# REVIEWER (SELECTED)

JAMA

Journal of Neuroscience Research Physiology and Behavior

Pharmacology, Biochemistry and Behavior Life Sciences

American Journal of Medical Genetics Part B: Neuropsychiatric Genetics. Current Anesthesia and Critical Care

Journal of Neuroscience Research Experimental Brain Research Neuropsychopharmacology Archives of Medical Research

Israeli Science Foundation: Research Grant Review

Motor Neuron Disease Association: Research GrantReview Neuroscience letters

Libertas Academica Saudi Medical Journal

Behavioral Brain Research Dove Medical Press

Neuroscience and Biobehavioral Review Synapse

Biological Psychiatry

European Neuropsychopharmacology Journal of Toxicology

Brain Research Experimental Brain Research

British Journal of Pharmacology Cannabinoids

Pharmacology Biochemistry and Behavior Psychopharmacology

Cell Biology and toxicology Journal of Neural Transmission Science Alert

Israeli Science Foundation

Motor Neuron Disease Association Current Neuropharmacology Pharmaceuticals Neurotherapeutics

# TEACHING EXPERIENCE: COURSES TAUGHT AT WPUNJ

Course Coordinator: Applied Anatomy and Physiology, 2004-present

|  |  |
| --- | --- |
| Bio 599 | Pharmacology (Development of Course) |
| Bio 460 | Pharmacology (Undergraduate) |
| Bio 560 | Pharmacology (Graduate) |
| Bio 114 | Applied Anatomy and Physiology. |
| Bio 113 | General Anatomy and Physiology to nursing students. |
| Bio 120 | Human Biology |
| Bio 164 | General Biology II |
| Bio 248 | Behavioral component of Ecology Evolution and Behavior (EEB). |
| Bio 415 | Psychopharmacology |
| Bio 480 | Bioseminar |
| Bio 499 | Independent Study |
| Bio 536 | Neural Basis of Behavior (Undergraduate/Graduate) |
| Bio 599 | CEDL 399 (Undergraduate/Graduate) - Workshop on Drug Addiction. |
| Bio 702 | Independent Reading (Graduate) |

# TEACHING AND RESEARCH DURING FULBRIGHT SABBATICAL

**-Courses taught at Addis Ababa University 2013-2014**

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| --- | --- | --- |
|  | Pharma | 6672 Autacoids and Neuropharmacology |
|  | Pharma | Molecular Cell Biology |
|  | Pharma | Molecular Pharmacology |

**-Master’s Thesis Defense Examiner at Addis Ababa University 2013-2014**

|  |  |  |
| --- | --- | --- |
|  | Pharma | Ermias Mergias |
|  | Pharma | Faiz Mohammed |
|  | Pharma | Jemal Abdela |
|  | Pharma | Jibril Seid |
|  | Pharma | Netsanet Fekadu |

**-Public Lectures at Addis Ababa and Jimma Universities 2013-2014**

Endocannabinoids: The brain and body’s marijuana and beyond.

# Guest and Visiting Professors to my laboratory & Pharmacology Course

2010-2010 Dr. Shan zhi Gu, Xian University, China.

2010-present Dr. Hiroki Ishiguro. University of Yamanashi, Japan. 2014-present Dr. Qing-Rong Liu, NIDA-NIH, Baltimore, MD

2014-present Dr. Joseph Morgan

2012-Present Dr. Zhicheng Carl Lin, Harvard University, Boston, MA 2017 Dr. George Koob. NIAAA-NIH Director, Bethesda, MD 2019 May-June Dr. Nicola Simola. University of Cagliari, Italy.

# Pre-Doctoral Students completing part of their PhD projects in my laboratory

1. Alvaro Llorente-Berzal: European Research Scholar from Spain, completed part of his PhD research with me in 2008
2. Joao Carlos Escostteguy-Neto: Brazilian research scholar completed part of PhD research with me in 2013.
3. Berhanu Gibret. Addis Ababa University, Ethiopia. Research on Khat interaction with the endocannabinoid system in mouse models of CNS function, 2019.

# Supervision of Student Reading and Research at William Paterson University

1. Chiara Brandoni: Independent Study on interaction of rimonabant on withdrawal from cocaine after chronic cocaine treatment 2002.
2. Danielle Colas. Behavioral effects of capsaicin 2003.
3. David Niglo: Independent-Reading 2003.
4. Zoila Mora: Summer Research 2003
5. Alex Perchuk: Independent Study. Prenatal exposure to capsaicin, 2004.
6. Lester Myers: Summer Research 2004
7. Caroline Schmidt: Independent Reading spring 2004
8. Jocelyn Dexter: Independent Reading spring 2004
9. Sejal Patel: Independent Study summer 2004
10. Tiffany Alderson: Independent Reading summer 2004.
11. Shoma Dutta: Genetic Immunization (DNA vaccine). 2005.
12. Lindsey Teasenfitz: Independent Study fall, 2005
13. Gabriela Hrebrikova: Independent Research and assistant, 2005
14. Amer Moughrab: Independent Reading, fall 2005.
15. Josaih Adaelu: Graduate Independent Reading, 2005.
16. Paul Meozzi: Student Research Assistant, 2006.
17. David Macharia: Independent study project titled, “Behavioral Effects of CB2 Receptor antagonism in Mice under the Chronic Mild Stress Model of Depression”, 2006.
18. Orlando Carpio: Graduate Student research project titled, “The role of CB2 cannabinoid receptors in mice alcohol preference and food intake and in human alcoholism”, and 2006.
19. Angelica Alvarez: Student Assistant project titled, “The role of CB2 cannabinoid receptors in mice alcohol preference and food intake and in human alcoholism”, 2006.
20. Hock, E: Student research assistant project titled, “A role of CB2 cannabinoid receptors in depression and substance abuse”, 2006.
21. Joanne Hung: Student research assistant project titled, “ Neurobehavioral effects of CB2 cannabinoid receptor activation”, 2006
22. Ennid Gonzalez: Student research assistant project, titled “Modification of mouse behavior by CB2 cannabinoid receptor ligands”, 2007
23. Jennifer Lee: Student research assistant, project titled “Modification of mouse behavior by CB2 cannabinoid receptor ligands”, 2007.
24. Hale Atil: Student research assistant project, titled “Autism pilot project”, 2007.
25. Leizl Chua: Student research assistant project, titled “Autism pilot project”, 2007.
26. Michele Volaric: Graduate Independent Reading, 2007.
27. Elizabeth Njoroge: Graduate Independent Reading, 2007.
28. Tara Halpern: Student Research Assistant, Endocannabinoid system in Autism, 2008.
29. Mersiha Mehanovic: CB2 cannabinoid receptors and depression, 2008.
30. Evadney Brown: CB2 cannabinoid receptors and depression, 2008.
31. Jacqueline Pietri: CB2 cannabinoid receptors and depression, 2008.
32. Uma Mirza: Undergraduate Independent Reading, 2008.
33. Alvaro Llorente-Berzal: Research Scholar from Spain, completing part of his pre- doctoral research with me, 2008.
34. Maria Bell: Graduate Independent Reading, 2008.
35. Mridula Shukla: Graduate Independent Reading, 2008.
36. Steve Wang: Summer High School Research Assistant, Endocannabinoid and psychostimulant action in a mouse model of autism, 2009
37. Tara Halpern: Student Research Assistant, Endocannabinoid system in Autism,2009.
38. Monzer Fares El-Safdi: Graduate Independent Reading, 2009.
39. Sean Edward Santiago: Graduate Independent Reading, 2009.
40. Kayode Oluyemi: Graduate Independent Reading, 2010.
41. Apeksha Rao: Grad. Ind. Reading on therapeutic progress in Parkinson’s disease. 2010.
42. Nancy Abdallat: Grad. Ind. Reading on telomeres and ageing. 2010.
43. Sachin Thakkar: Grad. Ind. Reading on heat shock proteins and ageing process. 2010.
44. Swapnil Macwan: Grad. Ind. Reading on malaria vaccine: new hope for cure. 2010.
45. Carina Puello: Grad. Ind. Reading on clinical advances in diagnosis and prognosis of acute myeloid leukemia. 2011.
46. Dosuek Kim: Grad. Ind. Reading on possible therapeutic application of dopaminergic ligands in obesity. 2011
47. Fatima Bensabeur: Grad. Ind. Reading and Study on the interaction between alcohol and cannabinoids and Dopamine: Does it have a role in drug addiction? 2011.
48. Daniel Rizzolo: Grad. Ind. Reading on therapeutic effects of arsenic trioxide in acute myeloid leukemia. 2012.
49. Larissa Pamen: Grad. Ind. Reading and Study on cannabinoid receptor genes, gene structure, regulation and variation. 2012 -2013.
50. Chris Mat: Grad. Ind. Reading. Nanoparticles in detection and treatment of cancer in humans. 2012.

# Students Completing Research and Research Assistants in my lab 2014-2019

1. Ndeah Terry: Independent study on the “Molecular Basis for Chronic Mild Stress Induced Depression: the Role of CB2 cannabinoid receptor gene expression”.
2. Sneha Tammareddy: Independent study on the “Modification of acute stress inducedalcohol consumption by cannabinoid CB2 receptor”.
3. Jasmine Wood: Independent studyon “The Role of Cannabinoids in Anxiolysis in Autistic Phenotype Mice”.
4. Eugene Dennis: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
5. Monika Chung: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
6. Paola Velandria: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
7. Kevin Penkoski: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
8. Branden Sanabria: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
9. Stephen Gross: Research Assistant on the behavioral effects of CB2 cannabinoid receptor project.
10. Tameh Rohani: Research Assistant. Work on neuro-immune cannabinoid receptor crosstalk

# Teaching Experience at Meharry Medical College (MMC)

* + Overview of CNS drugs to Medical, Dental and Graduate students:- Anxiolytic agents Behavioral Pharmacology

Neuroleptic agents, Antidepressants and Anti-manic agents Anti-parasitics I-III and drugs used in leprosy

* + Vitamins and Anti-microbial agents to medical technology students
  + Drug Abuse Pharmacology to Medicalresidents
  + Anxiolytic agents in clinical pharmacology to Dentalstudents
  + **Course Co-coordinator, 1994 –1996:** Neuropsychopharmacology to Graduate students. My role: Lectured on serotonin, modern advances in psychopharmacology, summarizes course. Graded exams and presented report to Chairperson and Dean.

# Graduate Student Supervision at Meharry Medical College (MMC)

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| --- | --- | --- | --- |
| 1. | Cassandra Bishop Robinson | 2. | Shorye Payne |
| 3. | Deidra Atkins | 4. | Stephanie Talton |
| 5. | Karen McClendon | 6. | Carma D. Hodge. |

**Mentor to College/High School Students at MMC**

1. Tamra Gentry, 1995 Summer College Student
2. Ike Onwere, 1995 Summer NIH researchstudent
3. Carter Smith, 1996 Summer College Student
4. Jeff Smith, 1995 High School Student
5. Shan Duseja, 1994 High School Student

# Mentor to Post-Doctoral Fellows, Residents and other Visiting Professors at MMC

1. Dr. Amitabha Chakrabarti (1993-1999)
2. Dr. Saba Abaci (1998)
3. Dr. E. T. Gwebu: Professor on sabbatical and worked on cannabinoid receptor gene expression.
4. Dr. Ana Canseco Alba: Postdoc 2016-present. Analysis of mice with cell selective deletion of CB2 receptors from microglia and dopamine neurons.
5. Dr. Berhanu Kibret: 2020-present: Role of CB2 cannabinoid receptors in mouse models of CNS function. Molecular basis of behavioral changes.

# Continuing Education and Short Courses

* Second messenger systems. ASPET meeting in Montreal Canada, 1988
* Neurobiology of addictive disorders. Society for Neuroscience meeting. Phoenix, AZ, 1989
* Molecular endocrinology training course. Houston, TX, 1989
* Temple University certificate award of 2.0 continuing education units. 1991
* Spring series, Recombinant DNA course – A hands on course, 1993
* DNA Microarrays: Society for Neuroscience, Miami, FL, 1999.
* NIDA events on frontiers in addiction research at society for neursience meeting in Washington DC, USA, 2008.
* Emerging evidence for epigenomic changes in Human disease, NIH, Bethesda, 2009.

# Committees and other Special Assignments

1. Institutional Animal and Use Committee (IACUC) member at MMC, 1994-1996
2. MBRS grant advisory committee, 1994-1996
3. Neuroscience day symposium (1995), member and speaker
4. Cardiovascular Training grant: Co-PI and advisory committee member, 1994-1996
5. Faculty Welfare Committee (1995 – 1996)
6. Vanderbilt committee on Behavioral Genetics(1997)
7. Role model Scientist by Science Museum of Nashville, 1994
8. Symposium Organizer at IBNS meeting in Italy on Cannabinoids,2002.
9. Conducted Research and presentations to Graduate Students in Tsukuba, Japan 2005, 2006.
10. Member Program Committee IBNS, 2003-2006.
11. Chairman scientific sessions at ICRS and IACM meetings, 2005/2006.
12. Member CPDD minority representation committee, 2009
13. IDARS newsletter Editor, 2006-present.
14. Pharmaceuticals: Editorial Board Member andReviewer
15. Associate editor: Journal of drug and alcohol research.

# Committees and other Special Assignments at William Paterson University

1. Student Advisor: Average of about 25 students per semester, 2003-2017
2. Department of Biology Seminar Coordinator 2000-2006.
3. Course coordinator for Applied Anatomy and Physiology 2004-present.
4. Student and ad hoc biotechnology committee 2000-2003.
5. Pre-professional, Technician Review committee, Undergraduate curriculum, and Technology committee and Senate Athletic activities council committees. 2003-2005.
6. Faculty senate council, Graduate, 2004-2005 and 2016-present.
7. Member of search committee for Animal Physiologist/Behavioral Biologist position 2004, 2007.
8. Member Timely Degree Completion Initiatives (TDCI) Task Force on Pre-College Issues, 2007.
9. Member College of Science and Health Assessment Committee 2004-2006.
10. Member College of Science and Health Research Committee, 2008.
11. Member Nursing School search Committee 2008-present.
12. Member Biology Student Committee, 2007-2009.
13. Member Institutional Animal Care and Use Committee (IACUC), 2007-2011
14. Member Institutional Review Board, 2011-2013.
15. Developed Pharmacology Course, now offered every fall, 2005-present.
16. Formed an International Autism Collaborative Research Group, 2006-present.
17. Prepared Application for AALAC certification for use ofanimals.
18. Council Member Biology Department, 2009-2010.
19. Biology Department Assessment Committee Member, 2014-2015.
20. Graduate program committee member 2020 present.

# Invited Speaker and Presentations

* Behavioral and biochemical consequences of MPTP infusion into substantia nigra and caudate putamen of the rat brain, Florida A & M University, Tallahassee, 1990.
* The application of some behavioral and biochemical techniques to assess drug action in the brain; LSUMC, New Orleans (1990) and at Shreveport (1991), LA and at Southern University, Baton Rouge, 1990; and at Ohio Northern University, Ada,(1992)
* Potential application of 5-HT agents in schizophrenia; Stanford University Mental health Clinical Research Center. 1991
* A comparison of behavioral and [3H] BDZ binding in three rat strains. Morehouse School

of Medicine in Atlanta, GA, 1991

* Cellular and molecular biological approaches to further understand dopamine function in the CNS. University of Pennsylvania, Smell and Taste Center, Philadelphia, PA, 1991
* Cultural and b rai n research metho ds in A fric a. Int. s pea ker’ s bur e a u ( Bechtel International Center, Stanford University, for Gun High School Int. Festival, 1992
* Animal behavioral models for the study of anxiety. Synthex Inc. Palo Alto, 1992
* Predicting drugs with abuse potential using the two compartment black and white box, Synaptic Pharmaceutical Corporation, Paramus, NJ, 1992
* Animal behavioral models to study drug action in the brain. Visiting lecturer to the Department of Anesthesiology Grand Rounds, University of California, Davis, CA, 1992
* Are there subtypes of cannabinoid receptors in the brain? Kirksville College of Osteopatic Medicine, 1993.
* Molecular correlates of behavioral changes in assessing drug action in the central nervous system, Vanderbilt University, 1993.
* Neural Networks to predict neurobehavioral effects in the r odent model. Presentation to Tennessee State University and Meharry Medical College Collaborating group, 1994.
* Neurobiological basis of emotionality. Presented to organic chemistry,

biochemistry and psychology students and faculty at Oakwood College. April 26 and 27, 1994.

* Are there subtypes of marijuana receptors in the brain? Presented during the membrane biology research symposium sponsored by Meharry Center of Excellence in cell and molecular biology. May 9, 1994.
* Neurobiological bases of the action of psychostimulants in the hippocampus. Presented at the satellite meeting of the International society of Neurochem in Niigata, Japan. 1995.
* Aggression and hyperactivity following lesions of the raphe nuclei: Behavioral and neurochemical correlates. Presented at the1995 Neuroscience symposium on Violence and aggression-the neurochemical basis at Meharry Medical College. July 20-21, 1995.
* Molecular bases for neurobehavioral changes. Temple Universi t y Sc h ool of P h armacy. December 6, 1995.
* Animal models to study brain function. Elizabeth-City State University, NC. 2/8/96.
* Meharry representative on the 23rd annual symposium: Increasing Health career opportunities. A 16 Institutions Health Sciences consortium. Greensboro, NC,1996.
* Cannabinoid induced neurobehavioral alteration. Morehouse School of Medicine,1996.
* Recent advances in cannabinoid research. Presented to the Vanderbilt Addiction Medicine Rounds 1997.
* The use of genetically altered mice for neurobehavioral analysis. Presented at the Lawrence Livermore National laboratory, Livermore, CA, 1998.
* Cannabinoid receptor genetics and be havi or. Presented at the

International Cannabinoid Research Society in Montpellier, France, 1998.

* Cannabinoid receptor genetics and behavior. Presented at the University of Mississippi, Oxford, MS, 1999 and in 2008.
* Molecular genetic approach es in c a nn a bin oi d research. Presented to t he Molecular Neurobiology branch at NIDA intramural program in Baltimore, March, 2000.
* Progress in Cannabis Research. Presented at Columbia University’s division on substance abuse monthly seminar on 9/26/02.
* Ibogaine Research. Presented at Harlem NYC support for ibogaine and iboga access at the Dempsey center in NY on 11/16/2002.
* Cannabinoid Research Up date. Presented at the Psychiatry Department t reatment research center at UPENN on 01/27/2003.
* Cannabinoid Genomics. Presented at University of Buenos Aires on03/18/2003.
* Endocannabinoid hypothesis of substance abuse. Presented at IACM meeting in Leiden, Netherlands, 2005.
* Tsukuba University Japan: Lectured on the neurobiology ofaddiction, 2006.
* Xia University in China: Lectured on Discovery of CB2 receptors in the brain and endocannabinoid hypothesis of substance abuse, 2006.
* Howard University Washington DC: Lectured on Discovery of CB2 receptors in the brain and endocannabinoid hypothesis of substance abuse, 2007.
* Nathan Kline Institute, New York. Presentation on Discovery of Brain CB2 cannabinoid receptors.
* Neuronal CB2 cannabinoid receptors: Beyond neuro-immunocannabinoid activity. Oral presentation at the International Behavioral Neuroscience Society, St. Thomas.

Caribbean, 2008.

* Targeting brain neuronal CB2 cannabinoid receptors in drug abuse and depression. Oral presentation at International Cannabinoid Research Society meeting. Cyprus, 2008.
* Antidepressant-like behavioral effects of CB2 cannabinoid ligands in the mouse forced swim test. Poster presentation. ICRS, Cyprus.
* Brain c cannabinoid C B2 receptor and schizophrenia. Poster presentation. Society for Neuroscience meeting, Washington DC. 2008.
* CB2 Cannabinoid Receptors: Identification of novel human promoter elements, isoforms and tissue expression patterns. Poster presentation. Society for Neuroscience meeting, Washington DC. 2008.
* Targeting brain CB2 cannabinoid receptors in depression: From mice to human subjects. Poster presentation. Society for Neuroscience meeting, Washington DC. 2008.
* Behavioral effects of CB2 cannabinoid receptor activation and its influence on food and alcohol consumption in mice. Oral Presentation. WPUNJ research day. 2008.
* Guest Speaker: Drexel University College of Medicine, Philadelphia: Gender differences in drug effects, 2008.
* Targeting brain neuronal CB2 cannabinoid receptors in drug abuse and depression. International cannabinoid research society, Cyprus, 2008.
* Genetic basis of marijuana use: William Paterson University Research Symposium.
* ICRS in Chicago, USA; IDARS, in Seoul, S. Korea, 2009.
* Genetic basis of marijuana use, Fairleigh Dickinson University, NJ, 2010.

# RECENT PRESENTATIONS

* Symposium presentation titled “Neuro-immune crosstalk and CB2Rs in marijuana-cannabinoid medicine” in Puerto Vallarta, Mexico 2021.
* Co-Chairman of the Neurobiology of endocannabinoid system in psychiatric disorders, symposium at the AsCNP conference in Fukuoka, Japan October 10-14th, 2019.
* Co-Chairman of the Marijuana/Cannabinoids session at the 7th biennial meeting of International Drug Abuse Research Society in Casablanca, Morocco; September 2-6, 2019.
* Symposium organizer and Co-Chairman at IBNS conference in Florida 2018.

Hiroki Ishiguro, M.D., Ph.D. (Japan) and Emmanuel S. Onaivi, Ph.D. (USA). Advances in the neurobiology of cannabinoid type 2 receptors.

* Branden Sanabria, Ana Canseco-Alba, Qing-Rong Liu, Hiroki Ishiguro Emmanuel S. Onaivi. Microglial and dopaminergic-neuron-specific deletion of CB2 cannabinoid receptors in stress induced neuroinflammation and behavior. Presented at IBNS conference in Florida USA 2018.
* Zamora Maria F, Canseco-Alba Ana, Liu Qing-Rong, Onaivi Emmanuel S, Bierbower Sonya M. The role of cannabinoid 2 receptor in modulating microglia activation after a traumatic brain injury. Presented at IBNS conference in Florida USA 2018.
* Hiroki Ishiguro, Kouichi Tabata, Chiaki Mochizuki, and Emmanuel S. Onaivi. Environmental stressors induce psychosis based on genetic variation of Cannabinoid CB2 Receptors. Presented at IBNS conference in Florida USA 2018.
* Emmanuel S. Onaivi, Ana Canseco-Alba, Qing-Rong Liu, Hiroki Ishiguro. Cannabinoid Receptor Genetics: From Mice to Human Subjects. Presented at IBNS conference in Florida USA 2018.
* Bernadin Rollanda, Canseco-Alba Ana, Onaivi Emmanuel S. The role of cannabinoid CB2 receptors in cognitive function of DAT-Cnr2 conditional knockout mice. Presented at WPUNJ symposium in Wayne, NJ. 2018.
* Hammouda Mariam, Canseco Ana, Schanz Norman, Onaivi Emmanuel S The impact of selective deletion of cannabinoid CB2 receptors in the neurodevelopment of DAT-Cnr2 and Cx3cr1-Cnr2 transgenic mice. Presented at WPUNJ symposium in Wayne, NJ. 2018.
* Tameh Rohani, Canseco-Alba Ana, Schanz Norman, Liu Qing-Rong, Onaivi Emmanuel S. Characterizing the effects of deletion of CB2Rs in dopamine neurons in a novel mouse knockout strain. Presented at WPUNJ symposium in Wayne, NJ. 2018.
* Canseco A, Zhang H, Gardner EL, XI ZX, Ishiguro H, Liu QR, Onaivi ES. Cannabinoid typereceptors in brain dopamine neurons modulates anxiety-like and psychostimulant behaviors in floxed DAT-*Cnr*2 mouse model. Presented at IDARS meeting in Croatia, 2017.
* Onaivi ES, Canseco A, Zhang HY, Chung M, Dennis E, Sanabria B, Schanz N, Ishiguro H, Lin Z, Sgro S, Leonard CM, Gardner EL, Egan JM, Xi ZX, Liu QR. Behavioral modifications following deletion of type 2 cannabinoid receptors in dopamine neurons. Presented at IDARS meeting in Croatia in 2017.
* Onaivi ES. Neurobiology of compulsive behaviors: Translational tools in addiction. Presented at the International Neurotoxicology Association joint meeting with the Neurotoxicity Society in Florianapolis, Brazil 2017.
* Canseco A, Dennis E, Chung M, Sanabria B, Schanz N, Ishiguro H, Liu QR, Onaivi ES. Role of cannabinoid type 2 receptors in brain dopamine neurons in the rewarding effects of psychostimulants, alcohol and cannabinoids in DAT-Cnr2 conditional knockout mice. Presented at the society for neuroscience meeting in Washington DC in 2017.
* Ishiguro H, Tabata K, Mochizuki C, Onaivi ES. Environmental stressors and psychiatric disorders based on genetic dysfunction of cannabinoid CB2 receptor. Presented at the society for neuroscience meeting in Washington DC in 2017.
* Onaivi ES, Canseco A, Zhang HY, Chung M, Dennis E, Sanabria B, Schanz N, Ishiguro H, Lin Z, Sgro S, Leonard CM, Gardner EL, Egan JM, Xi ZX, Liu QR. Behavioral modifications following deletion of type 2 cannabinoid receptors in dopamine neurons. Presented at the society for neuroscience meeting in Washington DC in 2017.
* Onaivi ES, Canseco A, Liu QR, Ishiguro H. Cannabinoid receptor genetics: From mice to Human subjects. Presented at the World Congress of Biological Psychiatry in Copenhagen, 2017.
* Ishiguro H, Tabata K, Mochizuki C, Onaivi ES. Environmental stressors induce psychosis- based variation of cannabinoid CB2 receptors. Presented at the World Congress of Biological

Psychiatry in Copenhagen, 2017.

* Onaivi ES and Dennis E. Endocannabinoid system alteration in an animal model of Autism Spectrum Disorders (ASDs). Presented at the World Congress of Biological Psychiatry in Copenhagen, 2017.
* Onaivi ES and Liu QR. Species differences in cannabinoid receptor genes. Presented at the World Congress of Biological Psychiatry in Copenhagen, 2017.
* Onaivi ES. Endocannabinoid System. Presented at “Advancing Research, Scholarship and Creative Expression at William Paterson University. 2016.
* Qing-Rong Liu, Haiying Zhang, Hong Qu, Zheng-Xing Xi and Emmanuel S. Onaivi Species differences in cannabinoid CB1 and CB2 receptor gene structures, expression and function in human, rat and mouse. Marijuana cannabinoid Neuroscience summit, Bethesda, MD 2016.
* Hiroki Ishiguro, Kouichi Tabata, Emmanuel S. Onaivi. Environmental stressors induce schizophrenia-like symptoms based on genetic dysfunction of cannabinoid type 2 receptor. Marijuana cannabinoid Neuroscience summit, Bethesda, MD 2016.
* Eugene Dennis, Joao Escosteguy-Neto, Monika Chung, Hiroki Ishiguro, , Norman Schanz, Susan Sgro, Claire M. Leonard, Kevin Penkoski, Carl Lin, Syed F. Ali, Joseph Morgan, Scott Hall, Georgianna G. Gould, Jair Guilherme Santos-Junior, George R. Uhl, Balapal Basavarajappa, Qing-Rong Liu and Emmanuel S. Onaivi. Brain CB2 cannabinoid receptor (CB2R) expression during neurodevelopment and in transgenic MOR, DAT, DAT-CI and SERT knockout (KO) mice. Marijuana cannabinoid Neuroscience summit, Bethesda, MD 2016.
* Norman Schanz, Hiroki Ishiguro, Qing-Rong Liu and Emmanuel S. Onaivi. Involvement of CB2 cannabinoid receptors (CB2Rs) in alcohol consumption: From mice to Human subjects: Marijuana cannabinoid Neuroscience summit, Bethesda, MD 2016.
* Morgan JJ, Onaivi ES. Plant rebuild: Research with FDA/DEA schedule 3 (CIII) status by compounding or reverse engineering *C. Sativa’s* chemical components. ICRS meeting Wolfville, Nova Scotia 2015.
* Onaivi ES, Escosteguy-Neto J , Santos-Junior J, Sgro S, Schanz N, Dennis E, Pamen L, Leonard CM, Penkoski K, Chung M, Terry N, Wood J, Tammareddy S, Lin ZC, Morgan J, Hall F, Gould G, Balapal B, Uhl G, Ali S, Ishiguro H, Liu QR. Endocannabinoid system (ECS) alterations in an animal model of autism spectrum disorders. International drug abuse research society (IDARS) meeting in Sydney, Australia, 2015.
* Ishiguro H, Onaivi ES, Miyake K, Tabata K, Nakayama S, Sogabe H, Sakurai T, Kubota T, Motohashi N. NRCAM related neural system in an model of addiction. IDARS meeting Sydney Australia, 2015.
* Onaivi ES, Koob GF. Neurobiology of drug addiction – New tools for a pharmacogenomics approach. IDARS meeting Sydney Australia, 2015.
* Onaivi ES. Cannabisul in Medicina. Marijuana therapeutics. Invited lecture. Department of Addictology and Medical Psychology. State University of Medicine and Pharmacy, Chisinau, Moldova, 2015.

# BIBLIOGRAPHY

**DISSERTATION**

1. Onaivi, E. S: Behavioral and biochemical consequences of bilateral and unilateral infusion of 1- methyl-4-phenyl-1, 2, 3, 6-tetrahydropridine (MPTP) into the caudate putamen and substantia nigra of the rat brain. M.Sc. dissertation, University of Bradford, England,1985.
2. Onaivi, E. S: Development of behavioral models for the assessment of drug action on cerebral 5-hydroxytryptamine function. Doctoral dissertation. University of Bradford England, 1987.



Joshi N, Onaivi ES. Psychiatric Disorders and Cannabinoid Receptors. Ad Exp Med Biol. 2021: 1264:131-153. Doi: 10.1007/978-3-030-57369-0\_9.

Liu QR, Canseco-Alba A, Liang Y, Ishiguro H, Onaivi ES. Int J Mol Sci. 2020. 21(24):9763. Doi: 10.3390/ijms21249763.

Musa A, Simola N, Piras G, Caria F, Onaivi ES, De Luca MA. Brain Sci. 2020. 18:10(12):1011. Doi: 10.3390/brainsci10121011.

Onaivi ES, Sharma V. Cannabis for COVID-19: can cannabinoids quell the cytokine storm? Future Sci OA. 2020. Doi:10.2144/fsoa-2020-0124.

Onaivi ES, Chauhan SBP, Sharma V. Challenges of cannabinoid delivery: how can nanomedicine help? Nanomedicine. 2020. Doi: 10.2217/nnm-2020-0221.

Joshi N, Onaivi ES. Endocannabinoid System Components: Overview and tissue distribution. Ad Exp Med Biol. 2019, 1162:1-12. doi: 10.1007/978-3-030-21737-2-1.

Geresu B, Canseco-Alba, Sanabria B, Zhao J, Lin Z, Liu QR, Onaivi ES, Engidawork E. Involvement of CB2 receptors in the neurobehavioral effects of Catha Edulis (Vahl) Endl. (Khat) in mice. Molecules.

2019 Aug 30;24(17). pii: E3164. doi: 10.3390/molecules24173164.

Canseco-Alba A, Schanz N, Sanabria B, Zhao J, Lin Z, Liu QR, Onaivi ES. Behavioral effects of psychostimulants in mutant mice with cell-type specific deletion of CB2 cannabinoid receptors in dopamine neurons. Behav Brain Res. 2019, 360: 286-297.

Liu QR, Huang NS, Qu H, O’Connell JF, Gonzalez-Mariscal I, Santa-Cruz-Calvo S, Doyle ME, Xi ZX, Onaivi ES, Egan JM. Identification of novel mouse and rat CB1R isoforms and in silico modeling of human CB1R for peripheral cannabinoid therapeutics. [Acta Pharmacol Sin.](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/29991708) 2019, 40: 387-397.

[Perchuk A](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Perchuk%20A%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Bierbower SM](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Bierbower%20SM%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Canseco-Alba A](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Canseco-Alba%20A%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Mora Z](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Mora%20Z%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Tyrell L](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Tyrell%20L%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Joshi N](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Joshi%20N%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Schanz N](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Schanz%20N%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Gould GG](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Gould%20GG%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708), [Onaivi ES.](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Onaivi%20ES%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29991708) Developmental and behavioral effects in neonatal and adult mice following prenatal activation of endocannabinoid receptors by capsaicin. [Acta Pharmacol Sin.](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/29991708) 2019, 40: 418-424.

Ishiguro H, Miyake K, Tabata K, Mochizuki C, Sakurai T, Onaivi ES. Neural cell adhesion molecule regulating neural systems underlying addiction. Neuropsychopharmacology Rep. 2019, 39: 10-16.

Canseco-Alba A, Schanz N, Ishiguro H, Liu QR, Onaivi ES. Bio Protoc. 2018, Bio Protoc. 2018 Oct 20;8(20). pii: e3061. doi: 10.21769/BioProtoc.3061.

[Hiroki Ishiguro](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Hiroki%20Ishiguro&amp;orcid=0000-0002-1620-7204) , [Yasue Horiuchi](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Yasue%20Horiuchi&amp;orcid) , [Koichi Tabata](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Koichi%20Tabata&amp;orcid) , [Qing-Rong Liu](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Qing-Rong%20Liu&amp;orcid=0000-0001-8477-6452) , [Tadao Arinami](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Tadao%20Arinami&amp;orcid) and [Emmanuel](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Emmanuel%20%20S.%20Onaivi&amp;orcid)

1. [Onaivi.](http://www.mdpi.com.ezproxy.nihlibrary.nih.gov/search?authors=Emmanuel%20%20S.%20Onaivi&amp;orcid) Cannabinoid CB2 Receptor Gene and Environmental Interaction in the Development

of Psychiatric Disorders**.** Molecules 2018, *23*(8), 1836; [https://doi-](https://doi-org.ezproxy.nihlibrary.nih.gov/10.3390/molecules23081836) [org.ezproxy.nihlibrary.nih.gov/10.3390/molecules23081836.](https://doi-org.ezproxy.nihlibrary.nih.gov/10.3390/molecules23081836)

[Ishiguro H](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Ishiguro%20H%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29477030), [Higuchi S](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Higuchi%20S%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29477030), [Arinami T](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Arinami%20T%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29477030), [Onaivi ES.](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/?term=Onaivi%20ES%5BAuthor%5D&amp;cauthor=true&amp;cauthor_uid=29477030) Association between alcoholism and the gene encoding the endocannabinoid synthesizing enzyme diacylglycerol lipase alpha in the Japanese population. [Alcohol.](https://www-ncbi-nlm-nih-gov.ezproxy.nihlibrary.nih.gov/pubmed/29477030) 2018 May; 68:59-62. doi: 10.1016/j.alcohol.2017.09.005. Epub 2017.

Liu QR, Canseco-Alba A, Zhang HY, Tagliaferro P, Chung M, Dennis E, Sanabria B, Schanz N, Escosteguy-Neto JC, Ishiguro H, Lin Z, Sgro S, Leonard CM, Santos-Junior JG, Gardner EL, Egan JM, Lee JW, Xi ZX, Onaivi ES. (2017). Cannabinoid type 2 receptors in dopamine neurons inhibits psychomotor behaviors, alters anxiety, depression and alcohol preference. Scientific Reports. 7: 17410 (DOI: 10.1038/s41598-017-17796-y)

Ishiguro H and Onaivi ES. (2017). Beyond the Kraepelian dichotomy of schizophrenia and bipolar disorder. J. Schizophrenia Research. 4: 1-2.

Dang DK, Shin EJ, Mai AT, Jang CG, Nah SY, Jeong JH, Ledent C, Yamamoto T, Nabeshima T, Onaivi ES, Kim HC. (2017). Genetic or Pharmacological depletion of CB1 receptor protects against dopaminergic neurotoxicity induced by methamphetamine in mice. Free Radical Biology and Medicine. 108: 204-224.

Geresu B, Onaivi ES and Engidawork E. (2016). Behavioral evidence for the interation between cannabinoids and Catha edulis F. (Khat) in mice. Brain research. 1648: 333-338.

Escosteguy-Neto JC, Varela P, Correa-Neto NF, Coelho LS, Onaivi ES, Santos-Junior JG. (2016). Reconsolidation and update of morphine-associated contextual memory in mice. Neurobiol Learn Mem., 130: 194-201.

Zhang HY, Bi GH, Li X, Li J, Zhang SJ, Li CY, Onaivi ES, Gardner EL, Xi ZX, Liu QR. (2015). Species differences in cannabinoid receptor 2 and receptor responses to cocaine self- administration in mice and rats. *Neuropsychopharmacology,* 40: 1037-1051.

Onaivi ES, Ishiguro H, Liu QR (2015). Future perspectives: Cannabinoid CB2 receptor ligands and their therapeutic potential in mental diseases in L. Fattore (Ed): Cannabinoid in Neurologic and Mental Disease. Elsevier Inc.

Onaivi ES, Schanz N, Lin ZC. (2014). Psychiatric disturbances regulate the innate immune system in CSF of conscious mice. *Transl Psychiatry*, 4:e367.

Connors KA, Valenti TW, Lawless K, Sackerman J, Onaivi ES, Brooks BW, Gould GG. (2014). Similar anxiolytic effects of agonist targeting serotonin 5HT1A or cannabinoid CB receptors on zebrafish behavior in novel environments. *Aquat Toxicol.,* [Epub ahead of print].

Yuan Ma J, Zhi Gu S, Meng M, Hui Dang Y, Ya Huang C, Onaivi ES. (2014). Regional expression of extracellular signal-regulated kinase 1 and 2 mRNA in a morphine induced conditioned place preference model. *Brain Res.* 1543: 191-199.

Gould GG, Burke TF, Osorio MD, Smolik CM, Zhang WQ, Onaivi ES, Gu TT, DeSilva MN, Hensler JG. (2013). Enhanced novelty-induced corticosterone spike and upregulated serotonin 5HT1A and cannabinoid CB1 receptors in adolescent BTBR mice. *Psychoneuroendocrinology,* [Epub ahead of print]. Onaivi ES, Ishiguro H, Sgro S, Leonard CM. (2013). Cannabinoid receptor gene variations in drug addiction and neuropsychiatric disorders. *JDAR*, Doi:10.4303/jdar/235714.

Ishiguro H, Leonard CM, Sgro S, Onaivi ES. (2013). Cannabinoid receptor gene variations in neuropsychiatric disorders in Eric Murillo-Rodriguez (Ed): Endocannabinoids: Molecular, Pharmacological, Behavioral and Clinical Features.

Bentham Science Publishers.

Onaivi ES. (2011). Genetics of cannabinoids: When addiction is coded in our genes in Eric Murillo- Rodriguez (Ed): Molecular, Biochemical and Genetic aspects of

cannabinoids. Bentham Science Publishers.

Onaivi ES, Ishiguro H, Gu S, Liu QR. (2012). CNS effects of CB2 cannabinoid receptors: beyond neuro-immuno-cannabinoid activity. *J Psychopharmacol*, 26: 92- 103.

Ishiguro H, Hall FS, Horiuchi Y, Sakurai T, Hishimoto A, Grumet M, Uhl GR, Onaivi ES, Arinami

1. (2012). NrCAM – regulating neural systems and addiction-related behaviors. Addict Biol. Ahead of print.

Onaivi ES, Benno R, Halpern T, Mehanovic M, Sanders C, Yan X, Ishiguro H, Liu QR, Berzal AL, Viveros MP, Ali SF. (2011). Consequences of cannabinoid and monoaminergic system disruption in a mouse model of autism spectrum disorders. Curr Neuropharmacol,

9: 209-214.

Onaivi ES. (2011). Commentary: Functional neuronal CB2 cannabinoid receptors in the CNS. Curr Neuropharmacol, 9: 205-208.

Gould GG, Hensler JG, Burke TF, Benno RH, Onaivi ES, Daws LC. (2011). [Density and](http://www.ncbi.nlm.nih.gov/pubmed/21070242) [Function](http://www.ncbi.nlm.nih.gov/pubmed/21070242) [of Central Serotonin (5-HT) Transporters, 5-HT(1A) and 5-HT(2A) Receptors, and](http://www.ncbi.nlm.nih.gov/pubmed/21070242) [Effects of their](http://www.ncbi.nlm.nih.gov/pubmed/21070242) [Targeting on BTBR T+tf/J Mouse Social Behavior.](http://www.ncbi.nlm.nih.gov/pubmed/21070242) J Neurochem 116: 291- 303.

López EM, Tagliaferro P, Onaivi ES, López-Costa JJ. (2011). Distribution of CB2 cannabinoid receptor in adult rat retina. Synapse 65: 388-392.

Ali SF, Onaivi ES, Dodd PR, Cadet JL, Schenk S, Kuhar MJ, Koob GF (2011). Understanding the global problem of drug addiction is a challenge for IDARS scientists. Curr Neuropharmacol 9: 2- 7.

Onaivi, ES. (2010). Endocannabinoid system, pharmacogenomics and response to therapy. Pharmacogenomics, 11: 907-910.

Ishiguro H, Carpio O, Horiuchi Y, Shu A, Higuchi S, Schanz N, Benno R, Arinami T, Onaivi ES. (2010). [A nonsynonymous polymorphism in cannabinoid CB2 receptor gene is associated](http://www.ncbi.nlm.nih.gov/pubmed/19768813?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=3) [with](http://www.ncbi.nlm.nih.gov/pubmed/19768813?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=3) [eating disorders in humans and food intake is modified in mice by its ligands.](http://www.ncbi.nlm.nih.gov/pubmed/19768813?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=3) Synapse. 64: 92-96.

Onaivi ES. [Cannabinoid receptors in brain: pharmacogenetics,](http://www.ncbi.nlm.nih.gov/pubmed/19897083?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=2) [neuropharmacology,](http://www.ncbi.nlm.nih.gov/pubmed/19897083?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=2) [neurotoxicology, and potential therapeutic applications.](http://www.ncbi.nlm.nih.gov/pubmed/19897083?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=2) Int Rev Neurobiol: 88:335-69. 2009.

Liu QR, Pan CH, Hishimoto A, Li CY, Xi ZX, Llorente-Berzal A, Viveros MP, Ishiguro H, Arinami T, Onaivi ES, Uhl GR. [Species differences in cannabinoid receptor 2 (CNR2](http://www.ncbi.nlm.nih.gov/pubmed/19496827?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=4) [gene):](http://www.ncbi.nlm.nih.gov/pubmed/19496827?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=4) [identification of novel human and rodent CB2 isoforms, differential tissue expression](http://www.ncbi.nlm.nih.gov/pubmed/19496827?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=4) [and](http://www.ncbi.nlm.nih.gov/pubmed/19496827?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=4) [regulation by cannabinoid ligands.](http://www.ncbi.nlm.nih.gov/pubmed/19496827?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=4) Genes Brain Behav: 519-30. 2009.

Ishiguro H, Horiuchi Y, Ishikawa M, Koga M, Imai K, Suzuki Y, Morikawa M, Inada T, Watanabe Y, Takahashi M, Someya T, Ujike H, Iwata N, Ozaki N, Onaivi ES, Kunugi H, Sasaki T, Itokawa M, Arai M, Niizato K, Iritani S, Naka I, Ohashi J, Kakita A, Takahashi H, Nawa H, Arinami T. [Brain](http://www.ncbi.nlm.nih.gov/pubmed/19931854?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=1) [Cannabinoid CB2 Receptor in Schizophrenia.](http://www.ncbi.nlm.nih.gov/pubmed/19931854?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=1) Biol Psychiatry. 2010.

Onaivi ES. [An endocannabinoid hypothesis of drug reward and drug addiction.](http://www.ncbi.nlm.nih.gov/pubmed/18991888?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=8) Ann N Y

Acad Sci. 1139:412-21, 2008.

Brusco A, Tagliaferro PA, Saez T, Onaivi ES. [Ultrastructural localization of neuronal brain CB2](http://www.ncbi.nlm.nih.gov/pubmed/18991892?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=5) [cannabinoid receptors.](http://www.ncbi.nlm.nih.gov/pubmed/18991892?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=5) Ann N Y Acad Sci. 1139:450-7, 2008.

Onaivi ES, Carpio O, Ishiguro H, Schanz N, Uhl GR, Benno R. [Behavioral effects of CB2](http://www.ncbi.nlm.nih.gov/pubmed/18991890?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=7) [cannabinoid receptor activation and its influence on food and alcohol consumption.](http://www.ncbi.nlm.nih.gov/pubmed/18991890?itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum&amp;amp%3Bamp%3Bamp%3Bordinalpos=7) Ann N Y Acad Sci. 1139:426-33, 2008.

[Onaivi ES, Ishiguro H, Gong JP, Patel S, Meozzi PA\*, Myers L\*, Perchuk A\*, Mora Z\*,](http://www.ncbi.nlm.nih.gov/pubmed/18286196?ordinalpos=2&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) [Tagliaferro](http://www.ncbi.nlm.nih.gov/pubmed/18286196?ordinalpos=2&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) [PA, Gardner E, Brusco A, Akinshola BE, Hope B, Lujilde J, Inada T, Iwasaki S,](http://www.ncbi.nlm.nih.gov/pubmed/18286196?ordinalpos=2&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) [Macharia D\*,](http://www.ncbi.nlm.nih.gov/pubmed/18286196?ordinalpos=2&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) [Teasenfitz L\*, Arinami T, Uhl GR.](http://www.ncbi.nlm.nih.gov/pubmed/18286196?ordinalpos=2&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) Brain neuronal CB2-Rs in drug abuse and depression: from mice to human subjects. PLoS ONE. 3(2):e1640, 2008.

[Johnson WD 2nd, Parandaman V, Onaivi ES, Taylor RE, Akinshola BE.](http://www.ncbi.nlm.nih.gov/pubmed/18585685?ordinalpos=1&amp;amp%3Bamp%3Bamp%3Bitool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum) Disruption of agonist and ligand activity in an AMPA glutamate receptor splice-variable domain deletion mutant. Brain Res. 1222:18-30, 2008.

Iwasaki S, Ishiguro H, Higuchi S, Onaivi ES and Arinami T. Association study between alcoholism and endocannabinoid enzyme genes encoding fatty acid amide hydrolase and monoglyceride lipase in a Japanese population. Psychiatric Genetics 17: 215-220, 2007.

Ishiguro H, Iwasaki S, Teasenfitz L\*, Higuchi S, Horiuchi Y, Saito T, Arinami T and Onaivi ES. Involvement of cannabinoid CB2 receptor in alcohol preference in mice and alcoholism in humans. Pharmacogenomics. 7: 380-385, 2007.

Onaivi ES. Neuropsychobiological evidence for the functional presence and expression of cannabinoid CB2 receptors in the brain. Neuropsychobiology. 54: 231-246, 2006.

Onaivi ES, Ishiguro H, Gong JP, Patel S, Perchuk A, Meozzi PA\*, Myers L\*, Mora Z\*, Tagliaferro PA, Gardner E, Brusco A, Akinshola BE, Liu QR, Hope B, Iwasaki S, Arinami T, Teasenfitz L\* and Uhl GR. Discovery of the presence and functional expression of CB2 receptors in brain. Ann. N. Y. Acad. Sci. 1074: 514-536, 2006.

[Gong JP, Onaivi ES, Ishiguro H, Liu QR, Tagliaferro PA, Brusco A, Uhl GR.](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&amp;amp%3Bamp%3Bamp%3Bcmd=Retrieve&amp;amp%3Bamp%3Bamp%3Bdopt=AbstractPlus&amp;amp%3Bamp%3Bamp%3Blist_uids=16472786&amp;amp%3Bamp%3Bamp%3Bquery_hl=1&amp;amp%3Bamp%3Bamp%3Bitool=pubmed_docsum) Cannabinoid CB2 receptors: Immunohistochemical localization in rat brain. Brain Res. 1071: 10-23, 2006.

Tagliaferro P, Ramos JA, Onaivi ES, Evrard SG, Lujilde J and Brusco A. Neuronal cytoskeleton and synaptic densities are altered after a chronic treatment with the cannabinoid receptor agonist WIN 55212-2. Brain Res 1085: 163-176, 2006.

Chirwa, S., Aduonum, A., Pizarro, J., Kawai, Y., Gonzalez, M., McAdory, B.S., Onaivi, E.S & Rodriguez, E.J. Dopaminergic DA (1) signaling couples growth-associated protein-43 and long- term potentiation in guinea pig hippocampus. Brain Res Bull. 64: 433-40, 2005.

Ping-Wu Zhang, Hiroki Ishiguro, Tsuyuka Ohtsuki, Judith Hess, Fely Carillo, Donna Walther, Emmanuel S. Onaivi, Tadao Arinami, George R. Uhl. Human Cannabinoid Receptor 1: 5' Exons, Candidate Regulatory Regions, Polymorphisms, Haplotypes and Association with Polysubstance Abuse. Molecular Psychiatry, 9: 916-931, 2004.

Onaivi, E. S., Ishiguro, H., Lin, Z., Akinshola, B. E., Zhang, P-W and Uhl, G. R: Cannabinoid receptor genetics and behavior in: Onaivi, E. S (ed.), Biology of marijuana: from gene to behavior. London & New York: Taylor & Francis, 1-44, 2002.

Onaivi, E. S., Leonard, C. M., Ishiguro, H., Zhang, P-W., Lin, Z., Akinshola, B. E. Uhl, G. Endocannabinoids and cannabinoid receptor genetics. Prog. Neurobiology 66:307-344, 2002.

Onaivi, E. S., Ali, S. F., Chirwa, S. S., Zwiller, J., Thiriet, N., Akinshola, B. E and Ishiguro H. Ibogaine signals addiction genes and methamphetamine alteration of long-term potentiation. Ann N Y Acad Sci 965: 28-46, 2002.

Onaivi, E. S., Akinshola, B. E and Ali, S. F. Changes in gene expression and signal transduction following ibogaine treatment. Alkaloids Chem Biol. 56: 135-153, 2001.

Zhang, Z. J., Schmidt, D. E., de Paulis, T., Trivedi, B. E., Onaivi, E. S, Ebert, M. H and Hewlett,

W. A. Anxiolytic-like effects of DAIZAC, a selective high-affinity 5-HT3 receptor antagonist, in the mouse elevated plus-maze. Pharmacol. Biochem Behav. 69: 571-578, 2001.

Arinami, T., Ishiguro H. and Onaivi, E. S. Polymorphisms in genes involved in neurotransmission in relation to smoking. Eur J Pharmacol. 410: 215-226, 2000.

Onaivi, Emmanuel S., Gautama Chaudhuri, Asli S. Abaci, Monica Parker, Donald H. Manier, Peter

1. Martin and John R. Hubbard: Expression of cannabinoid receptors and their gene transcripts in human blood cells. Prog. Neuro-Psychopharmacol. & Biol. Psychiat. 23: 1063- 1077, 1999.

Hubbard, J. R., Franco, S. E. and Onaivi, E. S. Marijuana: Medical Implications. Am Fam Physician 60: 2583-93, 1999.

Akinshola, B. E., Taylor, R. E., Ogunsitan, A. B. and Onaivi, E. S. Anandamide inhibition of recombinant AMPA receptor subunits in xenopus oocytes is increased by forskolin and 8-bromo- cyclic AMP. Naunyn-Schmiedeberg’s Arch Pharmacol. 360: 242-248, 1999.

Akinshola, B. E., Chakrabarti, A. and Onaivi, E. S. In-vitro and in-vivo action of cannabinoids. Neurochemical Research 24(10): 1235-1242, 1999.

Onaivi, E. S., Reggio, P. H. and Chakrabarti, A. Genes encoding marijuana receptors. NIDA Res. Monog., 178: 238, 1998.

Onaivi, E. S., Ali, S. F and Chakrabarti, A. In-vivo ibogaine blockade and in-vitro PKC action of cocaine. Annals New York Acad. Sci. 844: 227-244, 1998.

Brock, J. W., Farooqui, S. M., Onaivi, E. S., Hamdi, A. and Prasad, C. Dietary protein and central monoamine concentrations in the rat. Nutritional Neuroscience 1: 69-76, 1998.

Chakrabarti, A., Ekuta, J. E. and Onaivi, E. S. Neurobehavioral effects of anandamide and cannabinoid receptor gene expression in mice. Brain Res. Bulletin 45: 67-74, 1998.

Stubbs, L., Chittenden, L., Chakrabarti, A and Onaivi E. S. The mouse cannabinoid receptor gene is located in proximal chromosome 4. Mammalian Genome, 7: 165-166, 1996.

Onaivi, E. S., Chakrabarti, A and Chaudhuri, G. Cannabinoid receptor genes. Progress in Neurobiology, 48: 275-305, 1996.

Onaivi, E. S., Bishop-Robinson, C.,Chakrabarti, A., Motley, E. D and Chirwa, S. S Neurobiological actions of cocaine in the hippocampus. Ann. NY Acad. Sci., 801: 76-94, 1996.

Onaivi, E. S., Chakrabarti, A., Gwebu, E. T. and Chaudhuri, G. Neurobehavioral effects of delta-9- THC and cannabinoid receptor gene expression in mice. Behavioral Brain Research 72(1-2): 115-125, 1995.

Chakrabarti, A., Onaivi, E. S. and Chadhuri, G. Cloning and sequencing of a cDNA encoding the mouse brain-type cannabinoid receptor protein. DNA Sequence 5(6): 385-388, 1995.

Onaivi, E. S., Bishop-Robinson, C., Darmani, N. A. and Sanders-Bush, E. Behavioral effects of (±)-1- (2,5-dimethoxy-4-iodophenyl)-2-aminopropane, (DOI) in the elevated plus-maze. Life Sciences, 57: 2455-2466, 1995.

Davies, M. F., Onaivi, E. S., Chen, S. -W., Maguire, P., Tsai, N. F and Loew, G. Evidence for central BDZ receptor heterogeneity from behavior tests. Pharmacol. Biochem. Behav. 49: 47-56, 1994.

Prasad C, Ikegami, H., Shimizu, I. and Onaivi, ES. Chronic nicotine intake decelerates aging of nigrostriatal dopaminergic neurons. Life Sciences 54: 1169-1184, 1994.

Farooqui, S., Brock, J. W., Onaivi, E. S., Hamdi, A and Chandan Prasad. Differential modulation of dopaminergic systems in the rat brain by dietary protein. Neurochemical Research, 19: 167-176.

1994.

Onaivi, E. S., Payne, S., Brock, J. W., Hamdi, A., Farooqui, S. and Prasad. Chronic nicotine reverses age-associated increase in tail-flick latency and anxiety in rats. Life Sciences, 54: 193- 202, 1994.

Onaivi E.S. Changes in dopamine, DA-D2 receptor mRNA expression following apomorphine induced hyothermia and Stereotypy. NeuroReport 4, 703-705. 1993.

Hamdi A., Onaivi E.S. Farooqui S, and C. Prasad. Levels of Protein in diet modulates dopamine receptor. Life Science 50: 1529-1534, 1992.

Salonen M, Onaivi E.S., and Maze M. Dexmedetomidine synergism with midazolam in the elevated plus-maze in rats. Psychopharmacology 108: 229-234, 1992.

Onaivi E.S., Brock J.W., and C. Prasad. Dietary protein levels alter rat behavior. Nutrition Research. 12: 1025-1039, 1992.

Onaivi E.S., Maguire P. Davies F, and Loew G. Comparison of the behavioral and central BDZ binding profile in three rat strains. Pharmacol. Biochem. Behavior 43(3): 825-831 (1992).

Prasad C, Hilton C.W., Szec C, Onaivi E.S. and P. Vo: Could dietary proteins serve as Cyclo His Pro precursors. Neuropetide 19: 17-21, 1991.

Onaivi E.S., Talton S, and C. Prasad. The level of protein in diet modulates the behavioral effects of amphetamine. Book Chapter Endocrine and Nutritional Control of Basic Biological Functions, H. Lehnert R. Murison, H. Weiner, D. Hellhammer and J. Beyer (Eds), 1991.

Costall B., Kelly M.E., Onaivi E.S. and Naylor R.J.: The effect of ketotifen in rodent models of anxiety and on the behavioral consequences of withdrawing from treatment with drugs of abuse. Naunyn-Schmiedebergs Archives of Pharmacology, 341: 547-551, 1990.

Singh V.B., Onaivi E.S., Tam-Hao Phan, and Margaret C. Boadle-Biber: The increase in rat cortical and midbrain tryptophan hydroxylase activity in response to acute or repeated sound stress are blocked by bilateral lesions to the central nucleus of the amygdala. Brain Res 530: 49-53, 1990.

Costall B., Jones B.J., Kelly M.E., Onaivi E.S., Naylor R.J. and M.B. Tyers: Odansetron inhibits a behavioral consequence of withdrawing from drugs of abuse. Pharmacol.

Biochemist and Behav. 1990 June, 36: 339-344.

Onaivi E.S., Green M.R. and B.R. Martin: Pharmacological characterization of cannabinoids in the Elevated-Plus Maze. J. of Pharmacol. & Exp. Ther., 253: 1002-1009. 1990.

Costall B., Jones B.J., Kelly M.E., Naylor R.J., Oakley N.R., Onaivi E.S. and M.B. Tyers. The effects of Ondansetron (GR38032F) in rats and mice treated subchronically with diazepam. Pharmacol. Biochem. Behav., 34: 769-778. 1990.

Barnes J.M., Costall B., Coughlan J., Domeney A.M., Gerrard P.A., Kelly M.E., Naylor R.J., Onaivi E.S., Tomkins D.M. and M.B. Tyers: The effects of Ondansetron, a 5 -HT3 receptor antagonist, on cognition in rodents and primates. Pharmacology Biochemistry and Behavior, 35:955-962, 1990.

Costall B., Jones B.J., Kelly M.E., Onaivi E.S., Naylor R.J., and M.B. Tyers: Sites of action of Odansetron to inhibit withdrawal from drugs of abuse. Pharmacology, Biochemistry and Behavior, 36: 97- 104, 1990

Barnes NM, Costall B., Kelly M.E., Onaivi E.S. and Naylor R.J.: Ketotifen and its analogues reduce aversive responding in the rodent. Pharmacology, biochemistry and Behavior 37: 785 - 793, 1990.

Onaivi E.S. and B.R. Martin: A neuropharmacological and physiological validation of a computer- controlled two-compartment black and white box for the assessment of anxiety. Prog. Neuro - Psychopharmacol & Biol. Psychiatry, 13: 963-976, 1989.

Costall B., Kelly M.E., Naylor R.J. and E.S., and M.B. Tyers: Neuroanatomical sites of action of 5- HT3 receptor agonist and antagonists for alteration of aversive behavior in the mouse. Br. J. Pharmacol. 96: 325-332, 1989.

Onaivi E.S., Todd S. and B.R. Martin: Behavioral effects in the mouse during and following withdrawal from ethanol ingestion and/or nicotine administration. Drug and Alcohol Dependence. 24: 205-211, 1989.

Martin B.R., Onaivi E.S. and T.J. Martin. What is the nature of mecamylamine's antagonism of the central effects of nicotine? Biochemical Pharmacology, 38:3391-3397, 1989.

Costall B., Kelly M.E., Naylor R.J. and Onaivi E.S.: The actions of nicotine and cocaine in a mouse model of anxiety. Pharmacology, biochemistry and Behavior. 33: 197-203, 1988.

Onaivi E.S. and B.R. Martin: Behavioral effects in the mouse during and following withdrawal from repeated ethanol and nicotine administration. Nida Research Monograph 90. Problems of drug dependence 355, 1988.

Costall B., Kelly M.E., Naylor R.J. and E.S. Onaivi: Actions of buspirone in a putative model of anxiety in the mouse. J. Pharm. Pharmacol. 40: 494-500, 1988.

Bradbury A.J., Costall, B. Naylor, RJ. and E.S. Onaivi: 5-Hydroxytryptamine involvement in the locomotor activity suppressant effects of amphetamine in the mouse. Psychopharmacology 93: 457-465, 1987.

# Books

Onaivi, E. S., Editor: Biology of marijuana: from gene to behavior. London & New York: Taylor &

Francis, 1-44, 2002.

Endocannabinoids: The Brain and Body’s Marijuana and Beyond. Editors: Emmanuel S. Onaivi, Takayuki Sugiura and Vincenzo Di Marzo. CRC Press. 2006.

Marijuana and Cannabinoid Research: Methods and Protocols. Editor: Emmanuel S. Onaivi. The Humana Press Inc. 2006.

Applied Anatomy and Physiology, Laboratory Manual, 2nd Edition. Emmanuel S. Onaivi and Donna R. Potacco. McGraw-Hill Company. 2005.

Applied Anatomy and Physiology, Laboratory Manual, 3rd Edition. Emmanuel S. Onaivi and Donna R. Potacco. McGraw-Hill Company. 2019.

# Book Chapters

Onaivi ES, Akinshola BE, Ali SF. Changes in gene expression and signal transduction following Ibogaine treatment. In, Ibogaine: Proceeding of the International conference. Eds KR Alper and SD Glick. Academic press 1999.

Ishiguro H, Leonard CM, Sgro S, Onaivi ES. Cannabinoid receptor gene

variations in neuropsychiatric disorders. In, Molecular, Pharmacological, Behavioral and Clinical Features. Ed. Eric Murillo-Rodrigues, 2013.

Onaivi ES, Ishiguro H, Sgro S, Leonard CM. Cannabinoid receptor gene variations in drug addiction and neuropsychiatric disorders. Journal of drug and alcohol research. 2013.

Onaivi ES. Genetics of cannabinoids: When addiction is coded in our genes. In: Molecular, biochemical and genetic aspects of cannabinoids. Ed. Eric Murillo Rodrigues, 2011.

Onaivi ES. Endocannabinoid hypothesis of drug addiction. The Praeger International Collection on Addictions. Ed. Angela Brown-Miller. 2: 371-382. 2009.

Ishiguro H, Koga M, Horiuchi Y, Onaivi ES and Higuchi S. Development of biomarkers for alcoholism and polysubstance abuse. Ritner MS (Ed). Neuropsychiatric Biomakers, Endophenotypes, and genes. Chapter 49, pages 863-873. 2009.

Onaivi ES, Ishiguro H, Liu QR (2015). Future perspectives: Cannabinoid CB2 receptor ligands and their therapeutic potential in mental diseases in L. Fattore (Ed): Cannabinoid in Neurologic and Mental Disease. Elsevier Inc.

Onaivi ES, Ishiguro H, Liu QR. (2017). Cannabinoid CB2 receptor mechanism of cannabis sativa. S. Chandra et al. (eds). In Cannabis sativa L. Botany and Biotechnology.

Josh N, Onaivi ES. Endocannabinoid system components: Overview and tissue distribution. *Adv Exp Med Biol,* 1162: 1-12. 2019.

# Selected Abstracts.

1. Onaivi ES, Ishiguro H, Leonard CM, Sgro S, Liu Q-R (2013). Behavioral effects of CB2 cannabinoid receptor gene variations and modulation. ICRS, Vancouver, Canada.
2. Onaivi ES, Ishiguro H, Leonard CM, Sgro S, Liu Q-R (2013). Involvement of CB2 cannabinoid receptors in alcohol consumption: From mice to Human subjects. ICRS, Vancouver, Canada.
3. Costall B., Naylor R.J. and E.S. Onaivi: A model of asymmetry and circling behavior following asymmetric lesion of mouse medial raphe nucleus. Br. J. Pharmacol. Suppl. 87: 214, 1986.
4. Onaivi E. S.Receptor changes and neurotransmitter dysfunction in animal m odels

of neurological disorders. European Neuroscience Association Autumn School, Santa Marguerita, Italy, 1987.

1. Onaivi E.S., Kelly M.E. and B. Costall: The topography of brain sites involved with the mediation of anxiolytic activity and anxiogenesis in the rodent. European

Neuroscience Association Winter School, Zuoz, 1987.

1. Onaivi E.S., Kelly M.E. and B. Costall: The locus of drug action in the brain to alter anxiety changes associated with chronic nicotine, cocaine and alcohol intake. European Neuroscience Association Winter School, Zouz, 1987.
2. Costall B., Kelly M.E., Naylor R.J., Onaivi E.S. and M.B. Tyers: Topography of the anxiolytic action of 5-HT3 receptor antagonists in mouse brain. Neurosci. Lett. Supp. 29: 571, 1987.
3. Costall B., Naylor R.J. and E.S. Onaivi: Circling behavior following lesion of the MRN is modified by drug action on 5-HT systems. Br. J. Pharmacol. Supp. 90: 255, 1987.
4. Kelly M.E., Costall B., Domney A.M. and E.S. Onaivi: Changes in anxiety during intake of drugs of addiction and anxiogenesis of abstinence withdrawal in rodent and primate. European Neuroscience Association Winter School, Zuoz, 1987.
5. Costall B., Naylor R.J., Onaivi E.S. and M.B. Tyers: GR38032F antagonizes the aggression caused by medial raphe nucleus lesions in the mouse. Neurosci. Lett. Supp. 29: 570, 1987.
6. Barry J.M., Costall B., Kelly M.E., Naylor R.J. and E.S. Onaivi: A simple habituation test on the mouse. Brit. J. Pharmacol. Suppl. 92: 651, 1987.
7. Costall B., Kelly M.E. and E.S. Onaivi: Reduction in anxiogenesis of withdrawal from long- term alcohol and nicotine intake by diazepam action in the amygdala. Presented at British Ass. Psychopharmacology, Cambridge, July1987.
8. Onaivi E.S. and B.R. Martin: The effects of some cannabinoids in a model of anxiety in rats and mice. Pharmacologist A135.7, 1988.
9. Onaivi E.S., Rosecrans, J.A. and B.R. Martin: Acute and subacute effects of nicotine in a mouse model of anxiety: Comparison with the reference anxiolytic diazepam.

Presented at the International Symposium on Nicotinic Receptors in the CNS, Uppsala, Sweden, and June 19-21, 1988.

1. Boadle-Biber M.D., Corley K.C., Onaivi E.S., Phan T.H. and V.B. Singh: Activation of cortical tryptophan hydroxylase by sound stress is blocked by bilateral lesions to the central nucleus of the amygdala. International Symposium on Serotonin from Cell Biology to Pharmacology and Therapeutics. 60, 1989.
2. Onaivi ES, Little PJ and Martin PJ: Approaches to the determination of the central sites of action of cannabinoids. ICSG meeting, Richmond, VA,1989.
3. Costall B., Kelly M.E., Naylor R.J., Onaivi E.S., and Tyers M.B: Topography of action of GR38032F to inhibit behavioral consequences of withdrawing from treatment with drugs of abuse. International Symposium on Serotonin from Cell Biology to Pharmacology and Therapeutics. 175, 1989.
4. Martin B.R., Onaivi E.S. and M.R. Green: Antagonism of 9-THC-induced

anxiogenesis in mice. FASEB Journal 3(4): A 1034, 1989.

1. Onaivi E.S., Mitchell J., Green M.R. and B.R. Martin: Predicting drugs with abuse potential using a mouse model of anxiety. FASEB Journal 3(3) A 5861989.
2. Green M.R., Onaivi E.S., Winckler R.L. and B. R. Martin: The behavioral effects of delta-9- THC in different mouse strains. Virginia Academy of Science 67th Annual meeting May 23- 26, 1989.
3. Onaivi E.S Brenda Costall, M.E Kelly and R.J Naylor. Behavioral models for the assessment of drug action on cerebral serotonin function. The New York academy of

sciences Abstracts. July 10-13, 92, 1989.

1. Onaivi E.S Brenda Costall, and R.J Naylor. Serotonergic involvement in the classical dopamine mediated stereotypy and catalepsy. Soc. Neurosc. Absts., 15: 235.2, 1989.
2. Barnes J.M. Costall B. Kelly, M.E., Naylor R.J., Onaivi E.S., Tomkins D.M., and Tyers M.B. GR38032F improves performance in a mouse habituation test, and inhibits cholinergic-linked deficits. Brit. J. Pharmacol., 98: 693p. 1989.
3. Onaivi E. S., Brock J.W., Hamdi A. and Prasad C. High-protein diet modulates dopamine- and non- dopamine mediated behaviors in rats. Soc., Neurosc. Absts. 16(2): 433.1,1990.
4. Onaivi E. S., Talton S. and Prasad C. Level of protein in diet modulates the behavioral effects of amphetamine. The Symposium on Endocrine and Nutritional control of basic biological functions. W. Germany, 1990.
5. Onaivi E. S., Talton S and C Prasad. The behavioral effects of d e l ta -9-THC is potentiated by dietary protein levels. The Clinical Research, Southern meeting, 38(4): 939A.
6. Hamid A, Onaivi E. S, Farooqui S, and C Prasad. Levels of Protein in diet modulates dopamine receptor. The Faseb Journal, 5(4): A853, 1991.
7. Onaivi E. S., Payne S, Brock J. W, Hamdi A, Farooqui S, and C Prasad. The performance of Sprague-Dawley and Hooded rats in the shuttle box avoidance paradigm is dependent on

the

level of protein in diet. Third International Brain Research Organization (IBRO) World Congress of Neuroscience Abstracts, Montreal, Canada. P66.36, 1991.

1. Onaivi E. S., Payne S, Brock J. W, Farooqui S, and C Prasad. Nicotine and age- associated decrease in tail-flick latency. Nida Research Monograph 119: 408,1992.
2. Salonen M, Onaivi ES, and Maze M. Dexmedetomidine synergism with midazolam in the elevated plus-maze in rats. Faseb Journal 5(6): A1880, 1992.
3. Onaivi ES and S Payne. Changes in dopamine, DA-D2 receptor mRNA expression following apomorphine induced hypothermia and stereotypy. Faseb Journal 5(6): A1831, 1992.
4. Brock J. Farooqui S, Onaivi ES, Hamdi A and Prasad C. Dietary Protein modulates dopamine levels in the rat brain. Soc. Neurosc. Absts 18(2): 634.16, 1992.
5. Onaivi ES, Little PJ and Martin BR. Approaches to the determination of the central sites of action of cannabinoids. Soc. Neurosc. Absts 18(1) 157.7, 1992.
6. Hamid A, Brock JW, Farooqui SM, Onaivi ES and Prasad C. Differential effects on 5-HT levels in the rat brain with changes in dietary protein/carbohydrate ratio. Presented at the clinical Research, Southern meeting in January, 1993.
7. Onaivi ES. The anxiolytic profile of buspirone can be detected in the elevated plus- maze test following a2-stimulation by dexmedetomidine. Soc. Neurosc. Absts.

19(1):310.8. 19993.

1. Onaivi ES and Chaudhuri, G. Are there subtypes of marijuana receptors in the brain?

ACNP meeting Honolulu. 1993.

1. Shockley DC, Ansah TA, Cornish JW and Onaivi ES. Strategies for evaluating drug abuse pharmacotherapy. Nida Research Monograph 141(1): 430, 1994.
2. Chaudhuri, C and Onaivi ES. Characterization of the transcriptional initiation sites of the brain- type and the peripheral-type human cannabinoid receptor genes. J. cellular Biochem. 18C: 16, 1994.
3. Chakrabarti, C Onaivi ES and Chaudhuri C. Structural characterization of cannabinoid receptor genes. NIDA Research Monograph series, 153(II): 401, 1994.
4. Bishop-Robinson, C., Freeman, L., Mock, Y. D., Ford, B. D., Motley, E. D., Parker, K., Chakrabarti, A., Chaudhuri, G., Chirwa, S., Hatcher, F. M. and Onaivi, E. S. The expression of protein kinase C isoforms in PC12 cells are differentially modulated by cocaine and alcohol. NIDA Research Monograph series, 153(II): 301, 1994.
5. Onaivi ES, Chakrabati A and Chaudhuri C. Evolutionary characterization of marijuana

receptor genes. Presented at NARCE conference Atlanta, 1994.

1. Onaivi ES, Parker KA, Chakrabarti A, Chaudhuri G, Motley ED, Bishop-Robinson C and Chirwa S. Neurobiology bases of methamphetamine action in the hippocampus. Society for Neuroscience abstracts 20(2) 529.2, 1994.
2. Chakrabarti, A., Onaivi ES and Chaudhuri C. Cloning, sequencing and characterization of mouse brain-type cannabinoid receptor gene. The Faseb Journal, 9(3): 2320, A404,1995.
3. Parker, K. A., Atkins, D., Bishop-Robinson, C., McClendon, K. and Onaivi, E. S. Caffeine alters the performance of three mouse strains in the elevated plus-maze test. The Faseb Journal, 9(3): 2357, A407, 1995.
4. Bishop-Robinson, C., Onaivi, E. S. and Zawia, N. The expression of protein kinase C isoforms in lead exposed PC12 cells following administration of cocaine and alcohol. The Faseb Journal, 9(4): 5462, A941, 1995.
5. Onaivi, E. S., Bishop-Robinson, C., Parker, K., Chakrabarti, A., Chaudhuri, G. and Chirwa,
6. S. Neurobiology of the action of cocaine in the hippocampus. The Faseb Journal, 9(3): 2320, A401, 1995.
7. Bishop-Robinson C, E. S. Onaivi, N. A. Darmani and E. Sanders-Bush. Behavioral

effects of (±‚-1-(2, 5-Dimethoxy-4-iodophenyl)-2-aminopropane, (DOI) in the elevated plus- maze test. Society for Neuroscience abstracts 21(2) 298.11, 1995.

1. Atkins, D. S., Zawia, N and Onaivi, E. S. Acrylamide-induced changes in the expression of Protein kinase isozymes in PC12 cells. Society for Neuroscience abstracts 21(2) 538.6,1995.
2. Chakrabarti, A., Ekuta, J. E., Smith, J. and Onaivi E. S. Neurobehaviora l effects of anandamide and cannabinoid receptor gene expression in mice. The Faseb Journal, 10(3): 4111, A711, 1996.
3. Onwere, I., Chakrabarti, A. and Onaivi, E. S. Effect of ibogaine on cocaine withdrawal anxiogenesis in mice. The Faseb Journal, 10(3): 2595, A450, 1996.
4. Onaivi, E. S., Chakrabarti, A., McDuffie, I., Chittenden, L. R., Stubbs, L. and Chaudhuri, G. Genes encoding marijuana receptors and their chromosomal localization. The Faseb Journal, 10(3): 1730, A300, 1996.
5. Onaivi, E. S., Chakrabarti, A., Chittenden, L. R. and L. Stubbs. Neurobehavioral specificity of Genes encoding cannabinoid receptors and their chromosomal localization. Abstracts of the International Behavioral Neuroscience Society, 5: 24, May1996.
6. Chakrabarti, A., Rossby, S. P., Manier, D. H., Perrin, C., Onaivi E. S. and Sulser, F. Molecular correlates of a chronic mild stress model of depression. Soc. Neurosc. Absts 22(3) 809.15, 1996
7. Onaivi, E. S. and Chakrabarti, A. Neurobehavioral specificity of genes encoding cannabinoid receptors. Soc. Neurosc. Absts 22(3) 662.5, 1996.
8. Onaivi, E. S., Chakrabarti, A and Biaggioni, I. Behavioral and central cardiovascular effects of cocaine. Soc. Neurosc. Absts 23(1) 169.1, 1997.
9. Chakrabarti, A., Onaivi, E. S., Sulser, F. and Akinshola, B. E. Interaction of cannabinoids with NMDA and non-NMDA glutamate receptors. Soc. Neurosc. Absts 23(1) 376.11, 1997.
10. Dutse, C., Schmidt, D. E. and Onaivi, E. S. Aggression and hyperactivity following lesions of the raphe nuclei: Behavioral and neurochemical correlates. Soc. Neurosc. Absts 23(1) 387.7, 1997.
11. Onaivi, E. S., Stubbs, L., Chakrabarti, A., Chittenden, L., Hurst, D.P., Akinshola, B. E., Shire,

D. and Reggio, P. H. Murine cannabinoid receptor genetics. The Faseb J. 12(4): A194, 1998.

1. Onaivi, E. S., Chakrabarti, A., Stubbs, L., Chittenden, L., Hurst, D.P., Akinshola, B. E., Shire,

D. and Reggio, P. H. Cannabinoid receptor genetics and behavior. ICRS Absts., 28,1998.

1. Onaivi, E. S., Akinshola, B. E. and Chakrabarti, A. Cannabinoid (CB1) receptor antagonism induces anxiolysis. ICRS Absts., 132, 1998.
2. Onaivi, E. S., Stubbs, L., Chakrabarti, A., Chittenden, L., Hurst, D.P., Akinshola, B. E., Shire, D., Parker M., Hubbard, J. R. and Reggio, P. H. Cannabinoid receptor genetics and Behavior. Soc. Neurosc. Absts., 24(2), 508.1, 1998.
3. Chakrabarti, A., Akinshola, B. E., Ansah, T. A., and Onaivi, E. S. Cannabinoid (CB1) receptor antagonism induces anxiolysis. Soc. Neurosc. Absts., 24(2), 508.1, 1998
4. Chakrabarti, A., Ali, S. F. and Onaivi, E. S. In-vivo Ibogaine blockade and in-vitro PKC action of cocaine. NIDA Res. Monog., 178: 237, 1998.
5. Onaivi, E. S., Stubbs, L., Chakrabarti, A., Chittenden, L., Hurst, D.P., Akinshola, B. E., Shire, D and Reggio, P. H. Anandamide and murine cannabinoid receptor genetics.

Anandamide and murine cannabinoid receptor genetics.NIDA Res. Monog., 179: 237, 1999.

1. Onaivi, E. S. and Akinshola, B. E. In-vitro and in-vivo action of cannabinoids. The Faseb J. 13(5): II 823.2, 1999.
2. Onaivi, E. S., Chaudhuri, G., Abaci, A. A., Parker, M., Manier, D. H., Martin, P. R. an d Hubbard, J. R. The influence of gender and ethnicity on the expression of cannabinoid receptors and their gene transcripts. CPDD Absts., 1999.
3. Onaivi, E. S., Chaudhuri, G., Abaci, A. A., Parker, M., Mainer, D. H., Martin, P. R. and Hubbard, J. R. Expression of cannabinoid receptors and their gene transcripts in human blood ICRS Absts. 1999.
4. Akinshola, B. E., Onaivi, E. S. and Taylor, R. E. Effects of N-glycosylated side chains on ethanol sensitivity of recombinant AMPA glutamate receptor. RSA Absts. 1999.
5. Onaivi, E. S. and Akinshola, B. E. In-vitro and in-vivo action of cannabinoids. IBRO Absts. 1999.
6. Onaivi, E. S., Chaudhuri, G., Abaci, A. A., Parker, M., Manier, D. H., Martin, P. R. and Hubbard, J. R. The influence of gender and ethnicity on the expression of cannabinoid receptors and their gene transcripts. IBRO Absts. 1999.
7. Onaivi, E. S., Hubbard, J. R., Aileru, A and Akinshola, B. E. Differential display of genes regulated by cocaine and cannabinoids. Soc. Neurosc. Absts., 25(2), 585.5, 1999.
8. Onaivi ES, Ishiguro H, Zhang PW, Akinshola BE, Lin Z, Darmani N, Leonard C, Hall FS, Hope B and Uhl GR. Cannabinoid genetics and behavior. Society for Neuroscience 32 nd Annual Meeting, Orlando, FL. November 2-7, 2002.
9. Zhang PW, Ishiguro H, Onaivi ES, Lin Z, Uhl GR. Human cannabinoid receptor 1 (CB1) gene structure, polymorphisms and associations with substance abuse. Society for Neuroscience 32nd Annual Meeting, Orlando, FL. November 2-7, 2002.
10. Onaivi, ES. Colas, D., Hall, FS. Taylor, RE., Uhl, GR. and Akinshola, BE. Interaction of cannabinoids and vanilloids: A biological basis of why some like it hot and others do not. Sixth IBRO world Congress of Neuroscience Abstracts. #2262, pg 206,2003.
11. Akinshola, B.E., Johnson, W.D., Onaivi, E.S and Taylor, R.E. Ethanol sensitivity of the capsaicin/vanilloid receptor. RSA abstract, Prague,2003.
12. Zhang PW, Ishiguro H, Onaivi ES, Lin Z and Uhl GR. Human cannabinoid receptor 1 (CB1) gene structure, polymorphisms and associations with substance abuse. *Society for Neuroscience 33rd Annual Meeting*, New Orleans, LA. November 8-12, 2003.
13. Johnson, W.D., Parandaman, V., Onaivi, E.S and Taylor, B.E. Ethanol sensitivity of a GluR1 AMPA receptor loop L3 truncation mutant and loop L3/C –terminal truncation double mutant. RSA abstract, Vancouver, Canada, 2004.
14. Mora, Z., Perchuk, A and Onaivi, E.S. Interaction of cannabinoids and vanilloids: A biological basis of why some like hot chili peppers and others do not. Undergraduate Research Posters on the Hill by CUR.pg 16, April 20, 2004.
15. Onaivi, E.S., Mora, Z., Perchuk, A., Brandoni, C., Leonard, C.M., Uhl, G.R and Akinshola, B.E. An endocannabinoid hypothesis of substance abuse. The Faseb Journal, 397.5, 2004.
16. Meozzi, P. A., S. Patel, L. Myers, C. M. Leonard, E. Gardner and E. S. Onaivi. 2004. Decreased alcohol consumption and enhanced cannabinoid CB2 receptor expression in mouse chronic mild stress model of depression. 7th annual undergraduate research symposium in the chemical and biological sciences, UMBC, Baltimore, MD.
17. Myers, L., S. Patel, P. A. Meozzi, C. M. Leonard, E. Gardner, E. S. Onaivi. 2005. Enhanced peripheral cannabinoid (CB2) receptor expression in brain and reduced alcohol consumption

in mouse chronic mild (CMS) model of depression. ICRS symposium on cannabinoids. Vermont USA.

1. Onaivi, E. S., H. Ishiguro, S. Patel, P. A. Meozzi, L. Myers, P. A. Tagliaferro, C. M. Leonard, E. Gardner, A. Brusco, B. E. Akinshola, Q-R. Liu, B. Hope and G. R. Uhl. 2005. Presence and functional expression of peripheral cannabinoid CB2 receptors in the brain. College on Problems of drug dependency. Orlando, FL.
2. Onaivi, E. S., H. Ishiguro, J-P. Gong, S. Patel, P. A. Meozzi, L. Myers, P. A. Tagliaferro, C. M. Leonard, E. Gardner, A. Brusco, B. E. Akinshola, Q-R. Liu, B. Hope and G. R. Uhl. 2005. Peripheral cannabinoid CB2 receptors are expressed in the brain and involved in depression and substance abuse. P. 66. ICRS symposium on cannabinoids. Vermont USA.
3. Onaivi ES, H. Ishiguro, J-P Gong, S. Patel, P.A. Meozzi, L. Myers, P. A. Tagliaferro, Leonard, E. Gardner, A. Brusco, B. E. Akinshola, Q-R. Liu, B. Hope and G. R. Uhl. 2005. Presence and functional expression of CB2 cannabinoid receptors in brain that is involved in depression and substance abuse. International Society for Neurochemistry/European Society for Neurochemistry Satellite meeting. Isola di San Servolo, Venice,Italy.
4. Gong, J-P., E. S. Onaivi and G. R. Uhl. 2005. Cannabinoid CB2 receptors: Immunohistochemical localization in rat brain. P. 91. ICRS symposium on cannabinoids. Vermont USA.
5. Onaivi, E. S., H. Ishiguro, J-P. Gong, S. Patel, P. Meozzi, L. Myers, Z. Mora, A. Perchuk, P. Tagliaferro, C. Leonard, E. Gardner, A. Brusco, B. Akinshola, Q-R. Liu, B. Hope, G. R. Uhl. 2005. International narcotic research society meeting. Annapolis, MD.
6. Gong, J-P., E. Onaivi, G. R. Uhl. 2005. Peripheral cannabinoid CB2 receptors: Expression in neuronal patterns and localization in rat brain. International narcotic research society meeting. Annapolis, MD.
7. Onaivi, E. S., H. Ishiguro, J-P. Gong, S. Patel, P. Meozzi, L. Myers, Z. Mora, A. Perchuk, P. Tagliaferro, C. Leonard, E. Gardner, A Brusco, B. Akinshola, Q-R. Liu, B. Hope, G. R. Uhl. 2005. Discovery of the presence and functional expression of CB2 cannabinoid receptors in brain that is involved in depression and substance abuse. Society for Neuroscience Abstracts. Washington DC.

**List of Published Work in My Bibliography:**

<https://www.ncbi.nlm.nih.gov/myncbi/emmanuel.onaivi.1/bibliography/public/>