

Irving E. Vega

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RESEARCH OBJECTIVE

(1) Understanding the molecular mechanism underlying neurodegenerative disorders such as Alzheimer disease and related dementias, (2) Identification of biomarkers that serve as indicators of disease progression or as diagnostic tool, (3) High-throughput protein analyses of tauopathy animal models and human tauopathy cases using mass spectrometry-based proteomics

TEACHING PHILOSOPHY

(1) “Hand-on” experiences and utilization of ordinary events as tools to teach basic science principles enhance students’ interest on acquiring new knowledge and facilitate the integration of the acquired knowledge into daily life tasks. (2) Student-citizen philosophy promotes and encourages the integration of students’ acquired knowledge into their communities, by generating on them a sense of social responsibility.

EDUCATION

1/2004-12/2005	Senior Research Fellow Mayo Clinic Jacksonville Department of Neuroscience
12/2002-12/2003	Research Fellow Mayo Clinic Jacksonville Department of Neuroscience
01/2002-12/2002	Postdoctoral Trainee Rutgers, The State University of New Jersey Department of Cell Biology and Neuroscience
01/2002	Ph.D. , Molecular Biology and Neuroscience Rutgers, The State University of New Jersey Thesis Topic: <i>The role of the Exocyst complex in neuronal differentiation</i>
05/1996	B.S. , Biology University of Puerto Rico, Mayagüez, Puerto Rico

PROFESSIONAL POSITIONS

- 09/2014-present **Associate Professor**
Department of Translational Sciences and Molecular Medicine
College of Human Medicine
Michigan State University
- 07/2013-05/2014 **Assistant Dean of Research**
Office of the Dean of Graduate School and Research
University of Puerto Rico – Rio Piedras Campus
- 09/2011-08/2014 **Undergraduate Training Program Director**
NIH-ENDURE NeuroID (neuroid.uprrp.edu)
University of Puerto Rico
- 06/2010-08/2014 **Associate Professor**
Department of Biology
University of Puerto Rico – Rio Piedras
- 12/2006-08/2014 **Core Facility Director**
Protein Mass Spectrometry Core
Faculty of Natural Sciences
University of Puerto Rico – Rio Piedras Campus
- 08/2012-08/2013 **Academic Director**
Honor Study Program
College of Natural Sciences
- 12/2005-05/2010 **Assistant Professor**
Department of Biology
University of Puerto Rico – Rio Piedras
- 03/2006-10/2009 **Associate Director**
Center for the Interdisciplinary Study of Genes, Brain and Mind
FILIUS Institute
University of Puerto Rico

ACADEMIC HONORS

- 2010 Tenured, Department of Biology, University of Puerto Rico-Río Piedras Campus
- 2008 Carl Storm Underrepresented Minority Fellowship, Gordon Research Conference:
Neurobiology of Brain Disorders
- 2007 Distinguished Lecture Series, Center for Translational Neuroscience, University of
Arkansas for Medical Sciences
- 2004 Keystone Symposia Minority Travel Award
Meeting: *Mass Spectrometry in System Biology*

- 2003 Technical Assistance Workshop Travel Award
National Institute on Aging
National Institutes of Health
- 2001 MAC/Pfizer, Inc. Poster Award
Minorities Affairs Committee Poster Session
41st American Society for Cell Biology Annual Meeting
- 2001 ASCB/Minorities Affairs Committee Travel Award
41st American Society for Cell Biology Annual Meeting
- 2001 NJAS-Award for Achievement in Research
Senior Academy Student Award
New Jersey Academy of Science
- 2001 Research Achievement Award
Research Day
UMDNJ-Robert Wood Johnson Medical School

FELLOWSHIPS

- 01/2004-12/2005 (F32-NS047930) Postdoctoral Fellowship
National Institute of Neurological Disorders and Stroke
National Institutes of Health
- 12/2002-12/2003 Robert and Clarice Smith Fellowship in Neurodegenerative Diseases and Stroke
Robert and Clarice Smith Foundation
Mayo Clinic Foundation
- 01/2002-12/2002 (RO1-NS38892-02S1) Supplement for Postdoctoral Underrepresented Minorities
National Institute of Neurological Disorders and Stroke
National Institutes of Health
- 04/1999-12/2001 (F31-GM20274) MARC-Predoctoral Fellowship
National Institute of General Medical Sciences
National Institutes of Health
- 01/1998-01/1999 (T32-GM08360) Graduate Training in Cellular and Molecular Biology
NIH-Training Grant
Department of Biochemistry
UMDNJ-Robert Wood Johnson Medical School
- 09/1996-01/1998 (T32-GM55145) Initiative for Minority Student Development
National Institutes of Health

Graduated School of Biomedical Sciences
UMDNJ-Robert Wood Johnson Medical School

08/1994-05/1996 (T34) MARC-NIGMS Undergraduate Fellowship
National Institute of General Medical Sciences
University of Puerto Rico, Mayagüez Campus
Mayagüez, Puerto Rico

RESEARCH EXPERINCE

RESEARCH SUPPORT

ACTIVE RESEARCH SUPPORT

1R15NS081593-01 Vega (PI) 12/01/2012-11/30/2015 \$300,000

NIH/NINDS

Autoimmune Biomarker Profiling In Tauopathy

The development of non-invasive diagnostic tools for neurodegenerative disorders, such as Alzheimer's disease and other tauopathies, is crucial for the testing of new forms of treatment that may prevent, retard or revert the progression of these diseases. The proposed research plan intends to characterize and validate the identification of autoimmune responses in the course of tau-mediated neurodegeneration. The results obtained may lead to the discovery of disease-specific protein biomarkers that serve as diagnostic tools and to better understand the pathobiology of tauopathies.

Role: PI

1R25GM097635-01 Garcia-Arraras/Vega (Multi-PIs) 09/01/2010-08/31/2015 \$1.7 M

NIH/NIGMS

Neuroscience Research Opportunities to Increase Diversity (NeuroID)

NeuroID aims to increase the opportunities available for undergraduate students in the area of Neurosciences. To achieve this goal, it is proposed a multi-component program which would include research experience, enhanced academic training, community outreach and professional development activities.

Role: PI

PENDING RESEARCH SUPPORT

1R21NS089983 VEGA (PI) 12/01/2014-11/30/2016 \$275,000

Role of the novel amyloid protein EFhd2 in the pathobiology of tau-mediated neurodegeneration

The proposed project intends to create a novel mouse model where the human mutant tauP301L protein is overexpressed in the presence or absence of the gene that encodes the EFhd2 protein. This novel mouse model is required to directly test the putative pathological role of EFhd2 in tau-mediated neurodegeneration. The results obtain may lead to important breakthroughs that will unmask molecular mechanisms involve in the pathobiology of tauopathies.

ROLE: PI

COMPLETED RESEARCH SUPPORT

F31GM20274 Vega (PI) 05/01/1999-12/31/2001

NIGMS/NIH-MARC Predoctoral Fellowship

Project: Rad23 phosphorylation in DNA repair and proteasome interaction

The goal of this project was the identification of a Rad23-specific kinase and characterization of the role that phosphorylation plays in Rad23 biological function

Role: Principal Investigator

RO1NS38892-02S1 Hsu (PI) 01/01/2002-12/31/2002

NINDS/NIH-Supplement for Postdoctoral Underrepresented Minorities

Project: The role of the exocyst complex in neuronal differentiation

The main goal of this project was the characterization of the association between the exocyst complex and microtubules during neuronal development

Role: Post-doctoral Fellow (Supplement)

Smith Fellowship in Neurodegenerative Diseases and Stroke

Vega (PI)

01/01/2003-12/31/2003

Mayo Clinic

Project: Molecular events involved in tau-induced neurodegeneration

This project was directed toward the identification of phosphorylation events that leads to tau aggregation in the tauopathy mouse model JNPL3

Role: Principal Investigator

F32NS047930 Vega (PI) 01/01/2004-12/31/2005

NINDS/NIH-Ruth L. Kirschstein National Research Service Award

Project: Proteome analysis in transgenic mice expressing P301L tau

Identification of proteins associated to tau and those altered during tau-induced neurodegeneration in the tauopathy mouse model JNPL3

Role: Principal Investigator

1SC1NS066988-01 Vega (PI) 08/01/2009-12/31/2013 \$1.0 M

NIH/NINDS

The role of a novel tau-associated protein in neurodegeneration

The proposed project intends to characterize the role that the novel tau-associated protein TEA plays in the development and/or progression of tau-mediated neurodegeneration.

Role: PI

2P20RR016470-09 Peña S (PI) 08/01/2009-07/31/2014 \$10,000

NIH/NCRR

Advancing competitive Biomedical Research in Puerto Rico

The continued development of the biomedical research infrastructure in Puerto Rico is achieved through the implementation of a strengthened and cohesive structure with improved integration of common scientific and educational interests, collaborations, and a newly created Mentoring Initiative.

Role: Core Facility Director

FIPI-0660010 Vega (PI) 07/01/2009-06/30/2011 \$20,000

Institutional Funds UPR-Rio Piedras Campus

Functional profiling of brain regions in a Tauopathy Mouse Model

The tauopathy mouse model JNPL3 develops brain-region specific neurodegeneration as observed in human. This brain-region specificity takes place despite the expression of the human tau protein in all

brain regions. Therefore, there are brain regions that are susceptible to tau-mediated neurodegeneration while others are resistant. The proposed project intends to identify proteins which expression is altered during the course of tau-mediated neurodegeneration.

Role: PI

3S06GM008102-35S1 Arce (PI) 08/01/2006-07/30/2008

NIH/Support of Continuous Research Excellence (SCORE)

Minority Biomedical Research Support Awards (MBRS)

Characterization of a novel tau-associated protein in a tauopathy mouse model

This grant intends to characterize a novel tau-associated protein indentified in Dr. Vega's laboratory.

Role: Subproject Principal Investigator

Budget: \$250,000

Center of Biomedical Research Excellence (COBRE) Bonaventura (PI) 07/01/2006-06/30/2007

NIH/NCRR

Protein Research Center – University of Puerto Rico

Project: Mass Spectrometry Facility

Role: Core Facility Director

Funding Period: July 2006 – June 2007

Budget: \$30,000

FIPI-880109 Vega (PI) 07/01/2006-06/30/2008

Institutional Funds UPR-Rio Piedras Campus

Characterization of association between TEA and Tau: Its role in neurodegeneration

Role: Principal Investigator

Budget: \$20,000

FILIUS Institute 07/01/2007-06/30/2008

University of Puerto Rico

Project: Proteomics study of autistic children in Puerto Rico: A pilot study

Role: Principal Investigator

Budget: \$40,000

FILIUS Institute 07/01/2006-06/30/2007

University of Puerto Rico

Project: Proteomics study of autistic children in Puerto Rico: A pilot study

Role: Principal Investigator

Budget: \$34,000

PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science

Society for Neuroscience

Asociación de Alzheimer y Desordenes Relacionados de Puerto Rico

BIBLIOGRAPHY

PEER-REVIEWED SCIENTIFIC ARTICLES

Vazquez-Rosa E, Rodriguez-Crus EN, Serrano S, Rodriguez-Laureano L, **Vega IE** (2014) Cdk5 phosphorylation of EFhd2 at S74 affects its calcium binding activity. *Protein Science* 23:1197-207.

Nogueras-Ortiz CJ, De Jesús-Cortes HJ, Vaquer-Alicea J, **Vega IE**. (2014) Novel autoimmune response in a tauopathy mouse model. *Front Neurosci.* 2014 Jan 10;7:277. doi: 10.3389/fnins.2013.00277. eCollection 2014 Jan 10.

Lasalde C, Rivera A, Leon A, Gonzalez J, Estrella L, Correa M, Cajigas I, Bracho D, **Vega IE**, Wilkinson M, Gonzales CI (2014) Identification and Functional Significance of Novel Phosphorylation Sites in the NMD Protein Upf1. *Nucleic Acid Research* 42:1916-1929.

Trujillo U, Vázquez-Rosa E, Oyola-Robles D, Stagg LJ, Vassallo DA, **Vega IE**, Arnold ST, Baerga-Ortiz A (2013) Solution structure of the tandem acyl carrier protein domains from a polyunsaturated fatty acid synthase reveals beads-on-a-string configuration. *PLoS ONE* 8(2):e57859.

Ferrer-Acosta Y, Rodriguez-Cruz EN, Orange F, De Jesus-Cortes H, Madera B, Vaquer-Alicea J, Ballester J, Guinel M JF, Bloom GS, **Vega IE** (2013) EFhd2 is a novel amyloid protein associated to pathological tau in Alzheimer's disease. *J. Neurochem.* 125:921-931.

Arnold SE, **Vega IE**, Karlawish JH, Wolk DA, Nunez J, Negron M, Xie SX, Wang LS, Dubroff JG, McCarty-Wood E, Trojanowski JQ and Van Deerlin V. (2013) Frequency and Clinicopathological Characteristics of Presenilin 1 Gly206Ala Mutation in Puerto Rican Hispanics with Dementia. *J Alzheimers Dis.* 33:1089-1095

Ferrer-Acosta Y, Rodriguez-Cruz EN, Vaquer-Alicea AC and **Vega IE** (2013) Functional and Structural Analysis of the Conserved EFhd2 Protein. *Protein Pept Lett.* 20:573-583.

De Jesús-Crotés H, Nogueras-Ortiz CJ, Gearing M, Arnold SE and **Vega IE** (2012) Amphiphysin-1 protein level changes associated with tau-mediated neurodegeneration. *Neuroreport.* 23:942-946

Livney MG, Clark CM, Karlawish JH, Cartmell S, **Vega IE**, Entenza-Cabrera F and Arnold SE (2011) Ethnoracial differences in the clinical presentation of Alzheimer's disease. *Am. J. Geriatr. Psychiatr.* 19:430-439.

Bonaventura J, Rodriguez EN, Beyley V, and **Vega IE** (2010) Allylation of intraerythrocytic deoxygenated hemoglobin by raw garlic extracts. *J. Med Food* 13:943-949.

Dickinson GH, **Vega IE**, Walh KJ, Orihuela B, Beyley V, Rodriguez EN, Everett RK, Bonaventura J and Rittschof D (2009) Barnacle cement: a polymerization model based on evolutionary concepts. *J Exp. Biol.* 212:3499-3510

Steenland K, MacNeil J, **Vega I** and Levey A. (2009) Recent trends in Alzheimer disease mortality in the United States, 1999 to 2004. *Alzheimer Disease and Associated Disorders* 23:165-170.

Figuerola R, Steenland K, MacNeil J, Levey AI and **Vega IE** (2008) Geographical differences in the occurrence of Alzheimer's disease mortality: United States vs. Puerto Rico. *Am J Alzheimer Dis Other Demen* 23:462-469

Vega IE, Traverso EE, Ferrer-Acosta Y, Matos E, Colon M, Gonzalez J, Dickson D, Hutton M, Lewis J and Yen SH (2008) A novel calcium binding protein is associated with tau proteins in tauopathy. *J. Neurochem.* 106:96-106.

Vega IE, Grenningloh G, Hamano T, Propst JA and Yen SH (2006) Calpain mediated degradation of SCG10 protein upon Taxol-treatment and Tau overexpression. *Exp. Neurology* 202:152-160.

Fauq AH, Kache R and **Vega IE** (2006) Synthesis of an acid-cleavable isotope-coded affinity tag for proteomic expression profiling analysis. *Bioconjugate Chem.* 17: 248-254

Vega IE, Cui L, Propst JA, Lee G, Hutton M and Yen SH (2005) Increase in tau tyrosine phosphorylation correlated with the formation of tau-aggregates. *Mol. Brain Res.* 138:135-144

Ko L-W, DeTure M, Sahara N, Chihab R, **Vega IE** and Yen S-H (2005) Recent advances in experimental modeling of the assembly of tau filaments. *Biochim. Biophys. Acta* 1739: 125-139.

Sahara N, **Vega IE**, Ishizawa T, Lewis J, McGowan E, Hutton M, Dickson D and Yen SH (2004) Phosphorylated p38MAPK specific antibodies cross-reacted with sarkosyl-insoluble hyperphosphorylated tau proteins. *J. Neurochem.* 90: 829-838.

Vega IE and Hsu SC (2003) The septin Nedd5 protein associates with both the Exocyst complex and microtubules and disruption of its GTPase activity promotes aberrant neurite outgrowth in PC12 cells. *NeuroReport* 14: 31-37.

Vega IE and Hsu SC (2001) The Exocyst complex associates with microtubules to mediate vesicle targeting and neurite outgrowth. *J. Neuroscience* 21: 3839-3848.

Schauber C, Chen L, Tongaonkar P, **Vega I**, Lamberstson, D., Potts, W. and Madura, K. (1998) Rad23 links DNA repair to the ubiquitin-proteasome pathway. *Nature* 391: 715-718.

Schauber C, Chen L, Tongaonkar P, Vega I, and Madura K (1998) Sequence elements that contribute to the degradation of the yeast $G\alpha$. *Genes to Cell* 3: 307-319.

BOOK CHAPTERS

Vega, I.E., Rittschof, D., Dickinson, G. and Musgrave, I. (2012). Evolutionary Proteomics: Empowering Tandem Mass Spectrometry and Bioinformatics Tools for the Study of Evolution, Tandem Mass Spectrometry - Applications and Principles, Dr Jeevan Prasain (Ed.), ISBN: 978-953-51-0141-3, InTech

Vega, I.E. (2011). Nuevas esperanzas para pacientes de Alzheimer. In W.J. González Espada, D.A. Colón Ramos & M.I. Feliú Mójér (Eds.) *Ciencia Boricua: Ensayos y anécdotas del científico puertorrico* (ISBN 13: 978-1881748-83-9) (pp. 169-172). Ediciones Callejón

Vega, I.E. (2011). Tratamiento para la esclerosis múltiple en el embarazo. In W.J. González Espada, D.A. Colón Ramos & M.I. Feliú Mójér (Eds.) *Ciencia Boricua: Ensayos y anécdotas del científico puertorrico* (ISBN 13: 978-1881748-83-9) (pp. 178-180). Ediciones Callejón

ARTICLES

Vega, Irving E. (2011) El paciente y cuidador en la Navidad: Puntos a considerar. Reporte Médico (diciembre 2011-febrero 2012)

Vega, Irving E. (2011) En la piel, una esperanza real contra el Alzheimer. El Nuevo Día, Ciencia y Tecnología, (24 agosto)

Vega, Irving E. (2010) Células contra células en la enfermedad de Alzheimer. El Nuevo Día, Ciencia y Tecnología, (23 marzo)

Vega, Irving E. (2009) Un antibiótico contra Alzheimer, Parkinson, ALS, Huntington y mas... Boletín Asociación de Alzheimer de Puerto Rico, Septiembre.

Vega, Irving E. (2009) Ginkgo biloba, no es neuroprotector??? Boletín Asociación de Alzheimer de Puerto Rico, Septiembre.

Vega, Irving E. (2009) Demencia no necesariamente implica Alzheimer: *Dificultades al diagnosticar la enfermedad*. Reporte Médico: Instrumento de consulta profesional.
Ensayo hizo la portada de la edición de la revista.

Vega, Irving E. (2008) Envejece la población puertorriqueña. Fact Sheet 2008 Num. 2, Instituto FILIUS

Vega, Irving E. (2008) La proteína tau al centro de la Enfermedad de Alzheimer: ¿El que la hace la paga? Boletín Asociación de Alzheimer de Puerto Rico Año XXV Num. I (15 de marzo de 2008).

Vega, Irving E. (2007) Alivia la preñez los síntomas de la esclerosis. El Nuevo Día, Ciencia y Tecnología, (22 Mayo)

Vega, Irving E. (2007) Alzheimer's Disease: A hidden epidemic in Puerto Rico. Fact Sheet, Instituto FILIUS, Num. 1: 2007

Vega, Irving E. (2006) Nuevas esperanza para pacientes de Alzheimer. El Nuevo Día, Ciencia y Tecnología, (23 Diciembre) Pág. 115.
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Vega, Irving E. (2006) Enfermedad de Alzheimer: Un siglo después... CRONICA, Instituto FILIUS (Noviembre 2006) Págs. 14-18.

Vega, Irving E. (2005) La Universidad y El Gobierno. El Nuevo Día, *Perspectiva* (10 Junio), Puerto Rico

Vega, Irving E. (2004) Letters to the editor: Just a little pinprick. *The Scientist*, **18** (1): 10.

Vega, Irving E. (2003) Realidades y mitos sobre el SARS. *Revista Excelencia*, Año 2, edición 8: 29-30, Puerto Rico

Vega, Irving E. (2003) BOTOX: ¿Arma de doble filo? *Revista Excelencia*, Año 2, edición 7: 25, Puerto Rico

Vega, Irving E. (2003) Efectos de la terapia de reemplazo hormonal: de Preocupación a Precaución. *Revista Excelencia*, Año 2, edición 6: 35-36, Puerto Rico.

INTELLECTUAL PROPERTY

Certificado de Capacitación sobre la enfermedad de Alzheimer® [Training in Alzheimer's disease]
Vega IE, Lamoso M and Varcarel L
Registered 2007, Commonwealth of Puerto Rico

Patent Application: Abel Baerga-Ortiz, Uldaeliz Trujillo and Irving E. Vega. An Acyl Carrier Protein (ACP) from a marine bacterium with a capacity for self-loading: a potential tool to by-pass a key step in the biosynthesis of fatty acid and polyketide natural products. (Patent pending)

WEBSITE

Facebook Group Page – “Enfermedades neurológicas, Alzheimer, Parkinson y más...”

This is a webpage dedicated to provide information about neurological disorders, using modern communication outlets. There are more than 450 people subscribed from different Latin-American and European countries.

Published Assays and News Summary (in Spanish) in Facebook

Nueva posible estrategia para el tratamiento de Alzheimer (posted July 8, 2008)

Necesidad de tratamiento individualizado para pacientes de Esclerosis Múltiples (posted July 8, 2008)

Tratamiento antihistamínico resulta ser efectivo para el Alzheimer (posted July 18, 2008)

Nueva visión, nuevo medicamento para el Alzheimer (posted August 11, 2008)

Información para pacientes de Esclerosis Múltiples (posted October 14, 2008)

La enfermedad de Parkinson (posted October 24, 2008)

La proteína Netrin-1 pudiera proteger a pacientes que padecen MS (posted November 15, 2008)

Precaución con método de anestesia: Asociación con Alzheimer (poste November 17, 2008)

Un antibiótico contra Alzheimer, Parkinson, ALS, Huntington y más... (posted November 17, 2008)

Vacuna contra tratamiento para Esclerosis Multiple? (posted December 4, 2008)

Ginkgo Biloba, No es neuroprotector???) (posted November 20, 2008)

Manejo de conducta en la enfermedad de Alzheimer (posted December 16, 2008)

Envejece la población puertorriqueña (posted March 30, 2009)

Enfermedad de Alzheimer: epidemia oculta en Puerto Rico (posted March 30, 2009)

Nuevo medicamento para la esclerosis múltiple (posted May 1, 2009)

El Paciente y Cuidador en la Navidad: Puntos a considerar (posted December 8, 2009)

Aprobada versión genérica de Aricept (posted December 28, 2009)

ACADEMIC EXPERIENCE

COURSES TAUGHT, DEVELOPED OR REVISED:

Undergraduate Program

BIOL4031 Molecular and Cellular Biology I

Course taught: First Semester 2006, 2007, 2008, 2009

Students Impacted: ~500 students

BIOL4545 Biochemistry of the Cell

Course Coordinator

Revised and Coordinated Course:

- 1) Developed new Course Handbook and Syllabus
- 2) Developed Blackboard page
- 3) Organized a team of professors
- 4) Programmed Exams and separate classrooms
- 5) Grade students exams
- 6) All administration duties required for the course during the semester

Course taught: Second semester 2009, 2010

Student Impacted: ~400 students

BIOL4990 Introduction to research

Revised Course:

- 1) Integrate Community Outreach to the research experience
- 2) Students were asked to summarize scientific articles in lay language and save their essay as podcast
- 3) Students present their work and research articles at lab meetings

Course taught: academic years 2006-2007, 2007-2008, 2008-2009, 2009-2010

Student Impacted: 23 students

Graduate Program

BIOL5990 Proteomics

New Course

The course is based on conferences and discussion about principles, function and characterization of proteins. The course is directed to Biology major students to develop an in depth understanding of expression, structure, localization, modification, interaction and function of proteins purified from different organisms. In addition, the course provide an understanding of the role that proteomics plays in the study of biological systems and pathological processes.

BIOL6502 Fundaments of Molecular and Cellular Biology

Revised course:

- 1) Integration of basic bioinformatics concepts: Students were introduced to protein analysis using bioinformatics tools. Theory and practical sections were added to the course.
- 2) Introduction to peer-reviewed process: Students were asked to revise a fellow student proposal or manuscript draft.
- 3) Introduction of scientific manuscript preparation: Students were asked to prepare a scientific manuscript following the instruction of the journal Cell

Course taught: Second semester 2006, 2007, 2008, 2009, 2010

Student impacted: 40 students

BIOL6001 Biology Colloquium

Revised course:

- 1) Developed a blackboard page for the students registered in the course
- 2) A central topic was selected for all seminars during the semester
- 3) Speakers were asked to provide an abstract and representative published papers
- 4) Students were asked to read the papers before the seminar
- 5) A seminar to describe and explain best practices in Scientific Oral Presentation

Course taught: First semester 2009

Student Impacted: 23 students

WORKSHOPS AND LECTURES

Technical workshops

Proteomics Workshop (2 days)

Theory and Practical workshop on protein analysis for undergraduate, graduate, professors and industry

Proteomics Workshop (3 days)

Theory and Practical workshop on protein analysis using tandem mass spectrometry for undergraduate, graduate, technician and professors

Protein Analysis Course (4 days)

INTECO and UPR-Humacao

Theory and Practical workshop on protein analysis using tandem mass spectrometry for undergraduate, graduate, professors and industry

Mass Spectrometry-based proteomics workshop (1 day)

Theory and technical demonstration workshop on protein analysis using tandem mass spectrometry for undergraduate, graduate, technicians and professors associated to the INBRE Program

Techniques in Molecular Biology (1 day)
Theory and practical workshop on basic molecular techniques applied

Academic Workshops

Development of a Travel Award for Graduate Students and Postdoctoral Fellows to participate in a career development workshop

COMPACT for Faculty Diversity
Institute on Teaching and Mentoring
Southern Educational Board

Student Impacted: 6 graduate students participated on the career development workshop

“Certificado de Capacitación en la Enfermedad de Alzheimer”®

A registered workshop for health related professionals, caregivers and patients of Alzheimer’s disease (AD). The workshop impacted more than 50 professionals and promoted the establishment of Care Center for AD patients in Guaynabo City, Puerto Rico. All staff members were trained through this workshop.

Lectures

Biotechnology Certificate
UPR-Humacao

Lecture on advance protein analysis techniques as continued education for industry personnel
April 2007 and 2008

BIOL5548 Neurobiology
UPR-Rio Piedras
Lecture on Neurodegenerative disorders
October 2008

QUIM8998-013 Biophysical Methods
UPR-Rio Piedras
Lecture on Mass Spectrometry
April 2009 and 2010