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| BIOGRAPHICAL SKETCH |
|  |
| NAMEFernando Gabriel Noriega | POSITION TITLEProfessor of Biology |
| eRA COMMONS USER NAME (credential, e.g., agency login)noriegaf |
| EDUCATION/TRAINING  |
| INSTITUTION AND LOCATION | DEGREE*(if applicable)* | MM/YY | FIELD OF STUDY |
| Universidad Nacional De La Plata (Argentina) | BA | 03/81 | Zoology |
| Universidad Nacional De La Plata (Argentina) | Ph.D. | 07/87 | Zoology |
| University of Arizona | Postdoctoral  | 1989-1993 | Molecular Entomology |

A. Personal Statement

My laboratory employs an integrative approach that combines experiments at the organismal, cellular and molecular level to understand the synthesis and roles of Juvenile Hormone in mosquitoes. Juvenile hormone (JH) is a major hormonal regulator in insects. In the female of *Aedes aegypti*, JH signals the completion of the ecdysis to the adult stage, and initiates reproductive processes. Our research, which integrates metabolomics, genomics and proteomics tools, is uncovering that mosquito regulation of JH synthesis has unique features that are related to the adaptation to blood-feeding and the cyclic regulation of ovarian development. These unique features provide potential research opportunities for identifying targets for novel specific chemical and/or genetic strategies to control mosquitoes. I have 25 years of experience working on different *Aedes aegypti* physiological processes. My research has been always very innovative, and have received continuous support from NIH for the last 21 years.

B. Positions and Honors

Positions and Employments

1981-1988 Graduate Fellow Parasites and Vectors Center, Univ. Nacional de La Plata, Argentina.

1988-1989 Post-Doctoral Research Fellow, National Council of Scientific Research. Argentina.

1989-1993 Research Associate, Center for Insect Sciences, University of Arizona. Tucson, AZ

1994-2002 Research Assistant Professor, Department of Biochemistry, University of Arizona, Tucson, AZ

2002-2003 Research Associate Professor, Department of Biochemistry, University of Arizona, Tucson, AZ

2004-2007 Assistant Professor, Department of Biology, Florida International University. Miami, FL.

2007-2012 Associate Professor, Department of Biology, Florida International University. Miami, FL.

2012-Present Professor, Department of Biology, Florida International University. Miami, FL.

Other Experience and Professional Memberships

2010- Present Member Editorial Board Insect Biochemistry and Molecular Biology.

2019-Present Member Editorial Board Current Opinion on Insect Sciences.

2009-2015 NIH/NIAID Vector Biology Study Section, permanent member

2009-2012 Editor in Chief Journal Open Access Insect Physiology.

2007-2009 NSF Integrative biology review panel, member

2005-2009 NIH Peer Review Vector Biology Study Section ad hoc reviewer

Honors

1981-1988 National Council of Scientific Research Fellowship, Argentina. 2012

1989 National Council of Scientific Research Post-Doctoral Fellowship, Argentina

1989 Fulbright Foundation Travel Grant Award.

1994 Biomedical Research Abroad Award (BRAVO-NIH). Univ South Bohemia, Czech Republic

2001 Distinguish Visiting Professor Award. Mexico-United States Foundation for Sciences. Mexico.

2010 Selected as one of the 100 most prominent latinos in Miami.

2012 FIU Top Scholar 2012.

2015 FIU Top Scholar 2015.

2016 FIU Senate Research Award.

2016 FIU College Art Science Research Award.

C. Selected Peer-reviewed Publications (Selected from 91 peer-reviewed publications)

1. Nouzova, M., ⁠ Michalkova, V., ⁠ Ramirez, CE., Fernandez-Lima, F., Noriega, FG. (2019) Inhibition of juvenile hormone synthesis in mosquitoes by the methylation inhibitor 3-deazaneplanocin A (DZNep). Ins. Bioch. Molec. Biol. 113: 103183.
2. Nouzova, M., Clifton, M.E.,. Noriega FG (2019). Mosquito adaptations to hematophagia impact pathogen transmission. Curr Opin Insect Sci. 34:21–26.
3. Hernández-Martínez, S., Cardozo-Jaime, V., Nouzova, M., Michalkova, V., Ramirez, CE., Fernandez-Lima, F., Noriega. FG. (2019). Juvenile hormone controls ovarian development in female *Anopheles albimanus* mosquitoes. Nature Scientific Reports. 9:2127 | https://doi.org/10.1038/s41598-019-38631-6.
4. Castellanos A, Ramirez CE, Michalkova V, Nouzova M, Noriega FG, Fernández-Lima F. (2019). Three Dimensional Secondary Ion Mass Spectrometry Imaging (3D-SIMS) of *Aedes aegypti* ovarian follicles. J. Anal. At. Spectrom. DOI: 10.1039/c8ja00425k
5. Nouzova, M., Etebari, K., Noriega. FG., Asgari, S. (2018). A comparative analysis of *corpora allata*-*corpora cardiaca* microRNA repertories revealed significant changes during mosquito metamorphosis. Insect Biochem. Molec. Biol. 96: 10–18
6. Nouzova, M., Michalkova, V., Hernández-Martínez, S., Rivera-Perez, C., Ramirez, CE., Fernandez-Lima, F., Noriega. FG. (2018). JH biosynthesis and hemolymph titers in adult male *Aedes aegypti* mosquitoes. Insect Biochem. Molec. Biol. 95: 10-16.
7. Nouzova, M, Rivera-Perez, C., Noriega, F.G. (2018). Omics approaches to study juvenile hormone synthesis. Curr Opin Insect Sci. 29:49–55
8. Deshpande, S., Meiselman, M., Hice, R., Arensburger, P., Rivera-Perez, C., Kim, D-H., Croft, R., Noriega, FG, Adams, M. (2018). Ecdysis Triggering Hormone Receptors Regulate Male Courtship Behavior via Antennal Lobe Interneurons in Drosophila. Gen Comp Endocrinol S0016-6480(18)30323-X. doi: 10.1016/j.ygcen.2018.12.003
9. Noriega FG, Oliveira PL (2018). Editorial overview: Molecular physiology: from omics data encyclopedia to physiology ‘short stories’. Curr Opin Insect Sci. 29: vi–viii.
10. Zhe Qu, William G. Bendena , Wenyan Nong , Kenneth W. Siggens , Fernando G. Noriega , Zhen-peng Kai , Yang-yang Zang , Ho Yin Edwin Chan , Ting Fung Chan , Ka Hou Chu , Hon Ming Lam , Michael Akam , Stephen S. Tobe , Jerome Ho Lam Hui. (2017). MicroRNAs regulate the sesquiterpenoid hormonal pathway in Drosophila and other arthropods. Proceedings of the Royal Society B. In press.
11. Lee, SS., Ding Y., Karapetians N., Rivera-Perez, C., Noriega FG., Adams ME. (2017). Hormonal Signaling Cascade During an Early Adult Critical Period Required for Courtship Memory Retention in Drosophila. Current Biology, 2017 Sep 25;27(18):2798-2809.e3 doi: 10.1016/j.cub.2017.08.017
12. Rivera-Perez, C., Clifton, M.E., Noriega, F.G. (2017). How micronutrients influence the physiology of mosquitoes. Current Opinion in Insect Science, in press.
13. Meiselman, M., Lee, SS., Tran, RT., Dai, H., Ding, Y., Rivera-Perez, C., Wijesekera, TP, Dauwalder, B., Noriega, FG., Adams, ME. (2017). An Endocrine Network Essential for Reproductive Success in Drosophila melanogaster. PNAS, 114(19):E3849-E3858.
14. Hernández-Martínez, S., Sánchez-Zavaleta, M., Brito, K., Herrera-Ortiz, A., Ons, S., Noriega, FG (2017) Allatotropin: a pleiotropic neuropeptide that elicits mosquito immune responses. PLoS One. 12(4):e0175759. doi: 10.1371/journal.pone.0175759
15. Martínez-Rincón, RO, Rivera-Pérez, C, Diambra, L and Noriega. FG (2017) Modeling the flux of metabolites in the juvenile hormone biosynthesis pathway using generalized additive models and ordinary differential equations. PLoS ONE. e0171516. doi: 10.1371/journal.pone.0171516.
16. Ramirez, C.E., Nouzova, M., Benigni, P., Quirke, J.M., Noriega, F.G., Francisco Fernandez-Lima, F. (2016). Fast, ultra-trace detection of juvenile hormone III from mosquitoes using mass spectrometry. Talanta. 159: 371-8.
17. Zhu, J and Noriega FG (2016). The role of juvenile hormone in mosquito development and reproduction. Advances in Insect Physiology. Progress in Mosquito Research. Editor. Alex Raikhel. 51:93-113.
18. Mesquita, R. D. et al. (2015). The genome of *Rhodnius prolixus*, an insect vector of Chagas disease, reveals unique adaptations to hematophagy and parasite infection. PNAS 112:14936-14941. Epub 2015 Nov 16.
19. Nyati, P., Rivera-Perez, C., and Noriega, FG. (2015). Negative feedbacks by isoprenoids on a mevalonate kinase expressed in the *corpora allata* of mosquitoes. PLoS ONE 10(11): e0143107.doi:10.1371/journal.pone.0143107
20. Areiza, M., Nouzova, M., Rivera-Perez, C., and Noriega FG (2015). 20-hydroxyecdysone stimulation of juvenile hormone biosynthesis by the mosquito *corpora allata*. Insect Biochemistry and Molecular Biology. 64:100-105.
21. Hernandez-Martinez, S., Rivera-Perez, C., Nouzova M., and Noriega. FG (2015) Coordinated changes in JH biosynthesis and JH hemolymph titers in *Aedes aegypti* mosquitoes. J. Insect Physiology. 72: 22-27.
22. De Loof, A., Marchal, E., Rivera-Perez, C., Noriega, FG., Schoofs, L. (2015) Farnesol-like endogenous sesquiterpenoids in vertebrates: the probable but overlooked functional "inbrome" anti-aging counterpart of juvenile hormone of insects? Frontiers in Endocrinology. doi: 10.3389/fendo.2014.00222.
23. Nouzova, M., Rivera-Perez, C., Noriega FG. (2015) Allatostatin-C reversibly blocks the transport of citrate out of the mitochondria and inhibits juvenile hormone synthesis in mosquitoes. Insect Biochemistry and Molecular Biology. 57: 20-26.
24. Wen, D., Rivera-Perez, C., Abdou, M., Jia, Q., He, Q., Zyaan, O., Bendena, WB., Tobe, SS., Noriega, FG., Palli, SR., Wang, J., Li, S. (2015) Methyl Farnesoate Plays a Dual Role in Regulating Drosophila Metamorphosis. PLoS Genet 11(3): e1005038. doi:10.1371/journal. pgen.1005038
25. Villalobos-Sambucaro MJ., Lorenzo-Figueiras, AN., Riccillo, FL., Diambra, LA., Noriega, FG., Ronderos, JR (2015). Allatotropin modulates myostimulatory and cardioacceleratory activities in *Rhodnius prolixus* (Stal). PLoS One. 2015 Apr 21;10(4):e0124131. doi: 10.
26. Rivera-Perez, C., Nyati, P., Noriega, FG. (2015) A *corpora allata* farnesyl diphosphate synthase in mosquitoes displaying a metal ion dependent substrate specificity. Insect Biochem Mol Biol. 64:44-50.
27. Noriega, FG. (2014) Juvenile hormone biosynthesis in insects: What is new, what do we know, what questions remain? ISRN. doi.org/10.1155/2014/967361
28. Rivera-Perez, C., Nouzova, M., Lamboglia, I. and Noriega FG. (2014) Metabolomics Reveals Changes in the Mevalonate and Juvenile Hormone Synthesis Pathways. Insect Biochemistry and Molecular Biology. 51: 1-9.
29. Rivera-Perez, C., Nouzova, M and Noriega, FG. (2014) New Approaches to Study Juvenile Hormone Biosynthesis in Insects. In: Short Views on Insect Biochemistry and Molecular Biology. Chapter 7. 185-216.
30. Chandrasekar, R., Brintha, PG.,.Park, EY., Pelsoi, P., Liu, F., Goldsmith, M., Ejiofor, A., Pittendrigh, BR., Han, YS., Noriega, FG., Sugumaran, M., Tyagi, BK., Zheng, Z., Zhu, GF., Patnaik, BB and Michailova, P. (2014) Introduction to Insect Molecular Biology. In: Short Views on Insect Biochemistry and Molecular Biology. Chapter 1. 3-56.
31. Areiza, M., Nouzova, M., Rivera-Perez, C., and Noriega FG (2014). Ecdysis triggering hormone ensures proper timing of juvenile hormone biosynthesis in pharate adult mosquitoes. Insect Biochemistry and Molecular Biology.54: 98-105.
32. Clifton M.E., Correa S, Rivera-Perez, C., Nouzova, M and Noriega, FG. (2014). Male *Aedes aegypti* mosquitoes use JH III transferred during copulation to influence previtellogenic ovary physiology and affect the reproductive output of female mosquitoes. J Insect Physiology. Journal of Insect Physiology. 64: 40-47.
33. Perez-Hedo, M., Rivera-Perez, C. and Noriega, FG. (2014) Starvation increases insulin sensitivity and reduces juvenile hormone synthesis in mosquitoes. PLoS One 9:e86183
34. Perez M., and Noriega, FG. (2014). The sub-lethal larval metal stress response of the Dengue Fever Mosquito. Physiological Entomology. 39:111-119.
35. Alzugaray, ME., Adami, ML, Diambra L., Hernandez-Martinez, S., Damborenea, C., Noriega, FG, Ronderos, JR. (2013). Allatotropin: an ancestral myotropic neuropeptide involved in feeding. PLoS ONE 8(10): e77520. doi:10.1371/journal.pone.0077520
36. Nyati, P., Nouzova, M., Rivera-Perez, C., Clifton, ME., Mayoral, JG and Noriega, FG. (2013). Farnesyl phosphatase, a corpora allata enzyme involved in juvenile hormone synthesis in *Aedes aegypti*. PLoS ONE 8(8): e71967. doi:10.1371/journal.pone.0071967
37. Rivera-Perez, C., Nouzova, M., Clifton, ME., Martin Garcia, E., LeBlanc, E., and Noriega, FG. (2013) Aldehyde Dehydrogenase 3 Converts Farnesal into Farnesoic Acid in the *Corpora Allata* of Mosquitoes. Insect Biochem. Molec. Biol. 43:675-682.
38. Perez-Hedo, M., Rivera-Perez, C. and Noriega, FG. (2013) The Insulin/TOR signal transduction pathway is involved in the nutritional regulation of juvenile hormone synthesis in *Aedes aegypti*. Insect Biochem. Molec. Biol. 43:495-500.
39. Perez M., and Noriega, FG. (2013) *Aedes aegypti* pharate 1st instar quiescence: A case for anticipatory reproductive plasticity. Journal of Insect Physiology. 59: 318-324.
40. Mayoral, JG., Leonard, KT., Defelipe, LA., Turjansksi, AG. and Noriega, FG. (2013). Functional Analysis of a Mosquito Short Chain Dehydrogenase Cluster. Archives of Insect Biochemistry and Physiology. 82:96-115.
41. Rivera-Perez, C., Nouzova, M and Noriega, FG. (2012) A quantitative assay for juvenile hormones and their precursors using fluorescent tags. PLoS

ONE 7(8): e43784. doi:10.1371/journal.pone.0043784.

1. Diaz, M., Mayoral, JM., Priestap, H., Nouzova, M., Rivera-Perez, C., Noriega, FG. (2012). Characterization of an Isopentenyl Diphosphate Isomerase involved in the Juvenile Hormone pathway in *Aedes aegypti*. Insect Biochem. Molec. Biol. 42: 751-757.
2. Clifton M.E. and Noriega, FG. (2012). The fate of follicles after a blood meal is dependent on previtellogenic nutrition and juvenile hormone in *Aedes aegypti*. Journal of Insect Physiology 58: 1007–1019.
3. Perez M., and Noriega, FG (2012). *Aedes aegypti* pharate 1st instar quiescence affects larval fitness and metal tolerance. Journal of Insect Physiology. 58: 824-829.
4. Nouzova, M., Mayoral, J.M, Brockhoff, A Goodwin, M., Meyerhof, W. and Noriega F.G (2012). Functional characterization of an allatotropin receptor expressed in the corpora allata of mosquitoes. Peptides. 34:201-208.
5. Sanborn AF, Heath, JE, Phillips PK, Heath MS, and Noriega FG (2011) Thermal adaptation and diversity in tropical ecosystems: Evidence from Cicadas (Hemiptera, Cicadidae). PLoS One. 6 (12) :e29368. Epub 2011 Dec 29.
6. Clifton M.E. and Noriega, FG. (2011) Nutrient limitation results in juvenile hormone-mediated resorption of previtellogenic ovarian follicles in mosquitoes. Journal of Insect Physiology 57: 1274-1281.
7. Nouzova, M., EdwardsM., Mayoral J.M., Noriega, FG (2011) A coordinated expression of biosynthetic enzymes controls the flux of juvenile hormone precursors in the corpora allata of mosquitoes. Insect Biochemistry and Molecular Biology 41: 660-669.
8. Defelipe, L.A, Dolghih E, Roitberg A.E., Nouzova M., Mayoral J.G, Noriega F.G and Turjanski, A.G. (2011). Juvenile Hormone Synthesis: “esterify then epoxidize” or “epoxidize then esterify”? Insights from the Structural Characterization of Juvenile Hormone Acid Methyltransferase. Insect Biochemistry and Molecular Biology. 41: 228-235.
9. Navare A., Mayoral, J.G., Nouzova,M*.,* Noriega, F.G., Fernández, F.M. (2010) Rapid Direct Analysis in Real-Time (DART) Mass Spectrometric Detection of Juvenile Hormone (JH) III and its Terpene Precursors. Analytical & Bioanalytical Chemistry. 398:3005-3013.
10. Mayoral, JG., Nouzova, M., Brockhoff, A., Goodwin, M., Hernandez-Martinez, S., Richter, D., Meyerhof, Wand Noriega, FG. (2010). Allatostatin-C receptors in mosquitoes. Peptides, 31: 442-450
11. Jaime G. Mayoral, Francisco J. Alarcón, Tomás F. Martínez, Pablo Barranco and F.G. Noriega (2010) An improved End-Point Fluorimetric Procedure for the Determination of Low Amounts of Trypsin Activity in Biological Samples Using Rhodamine-110-Based Substrates. Applied Biochem Biotechnology. 160:1-8
12. Mayoral, J.G, Nouzova, M., Navare, A. and Noriega, FG (2009) NADP+-dependent farnesol dehydrogenase, a *corpora allata* enzyme involved in juvenile hormone synthesis PNAS, 106: 21091-21096
13. Mayoral, J.G., Nouzova, M., Michiyo Yoshiyama, Tetsuro Shinoda, Salvador Hernandez-Martinez, Elena Dolghih, Adrian G. Turjanski, Adrian E. Roitberg, Horacio Priestap, Mario Perez, Lucy Mackenzie, Yiping Li, and Fernando G. Noriega (2009) Molecular and functional characterization of a juvenile hormone acid methyltransferase expressed in the corpora allata of mosquitoes. Insect Biochemistry Molecular Biology. 39: 31-37.
14. Navare A., Nouzova,Fernando G. Noriega, Salvador Hernández-Martínez Christoph Menzel, Facundo M. Fernández (2009) On-Chip Solid-phase Extraction Preconcentration/Focusing Substrates Coupled to Atmospheric Pressure Matrix-Assisted Laser Desorption/Ionization Ion Trap Mass Spectrometry for High Sensitivity Neuropeptide Detection and Protein Identification Rapid Communications in Mass Spectrometry 23: 477-486.
15. [Berry, J.P., Gantar, M., Perez, M.H., Berry, G., and Noriega F.G. (2008) Cyanobacterial Toxins as Allelochemicals with Potential as Algaecides, Herbicides and Insecticides. Marine drugs 6: 117-146.](file:///C%3A%5CUsers%5CFernando%20Noriega%5CDesktop%5CNoriega%20Backup%5CDocuments%5CProgram%20Files%5CWS_FTP%5Cwebpage%5CBerryetal2008.pdf)
16. [Navare, A., Zhou, M., McDonald, J.,   Noriega, F.G., Sullards, C. and Fernandez, F.M.(2008)Serum Biomarker Profiling by Solid-Phase Extraction with Particle-Embedded Micro Tips and Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry. Rapid Communications in Mass Spectrometry 22:997-1008.](file:///C%3A%5CUsers%5CFernando%20Noriega%5CDesktop%5CNoriega%20Backup%5CDocuments%5CProgram%20Files%5CWS_FTP%5Cwebpage%5Cpapers%5CRCM_2008.pdf)
17. Martinez-Hernandez, S., Mayoral, J.G., Li, Y. and Noriega, F.G. (2007). Role of Juvenile hormone and allatotropin on nutrient allocation, ovarian development and survivorship in mosquitoes. J. Insect Physiology 53:230-234
18. Li, Y., Martinez-Hernandez, S., Fernandez, F., Mayoral, J.G., Topalis, P., Priestap, H., Perez, M., Navarete, A., and Noriega, F.G. (2006). Biochemical, molecular and functional characterization of PISCF-allatostatin, a [regulator of juvenile hormone biosynthesis](http://wos01.isiknowledge.com:80/?SID=6bPd7pmN69iLBacPlMC&Func=Abstract&doc=13/10) in the mosquito *Aedes aegypti*. J. Biological Chemistry 281: 34048-34055.
19. Noriega, F.G., Ribeiro, J.M.C., Koener, J.F.,Valenzuela, J.G., Hernandez-Martinez, S., Pham, V.M and Feyereisen, R. (2006) Comparative genomics of insect juvenile hormone biosynthesis. Insect Biochem. Molec. Biol. 36: 366-374.
20. Telang, A., Li, Y., Noriega F.G., and Brown M.R. (2006) Effects of larval nutrition on the endocrinology of mosquito egg development. J. Experimental Biology 209, 645-655.
21. Martinez-Hernandez, S., Li, Y., Rodriguez, M.H., Lanz-Mendoza H. and Noriega, F.G. (2005). Allatotropin and PISCF- and YXFGL-amide-allatostatins distribution in *Aedes aegypti* and *Anopheles albimanus* mosquitoes. Cell Tissue Research, 321:105-113.
22. Caroci, A., Li, Y. and Noriega, F.G. (2004). Reduced juvenile hormone synthesis in mosquitoes with low teneral reserves prevents ovarian previtellogenic development in *Aedes aegypti.* J. Experimental Biology 207:2685-2690.
23. Noriega, F.G (2004) Nutritional regulation of JH synthesis: a mechanism to control reproductive maturation in mosquitoes? Insect Biochem Molec. Biol. 34:687-693.
24. Sanborn, A.F., Heath, M.S., Heath, J.E., Noriega, F.G. and Phillips, P.K. (2004) Convergence and Parallelism Among Cicadas of Argentina and the Southwestern United States (Hemiptera: Cicadoidea). J. Zoology Linnean Society 83: 281-288.
25. Li, Y., Martinez-Hernandez, S. and Noriega, F.G. (2004). Inhibition of juvenile hormone biosynthesis in mosquitoes: effect of allatostatic head-factors, PISCF- and YXFGL-amide-allatostatins. Regulatory peptides 118: 175-182.
26. Caroci, A. and Noriega, F.G. (2003) Free amino acids are important for the retention of protein and non-protein meals by the midgut of *Aedes aegypti* females. J. Insect Physiology 49: 839-844.
27. Li, Y., Kuwano, E. and Noriega F.G. (2003) 1,5-disubstituted imidazoles inhibit juvenile hormone biosynthesis by the *corpora allata* of the mosquito *Aedes aegypti*. J. Insect Physiology 49: 1005-1011.
28. Li, Y., Unnithan, C., Martinez-Hernandez, S., Feyereisen, R. and Noriega, F.G. (2003) Activity of the corpora allata of adult female *Aedes aegypti*: effects of mating and feeding. Insect Biochem Molec. Biol. 33: 1307-1315.
29. Li, Y., Unnithan, C., Veenstra J., Feyereisen, R. and Noriega, F.G. (2003) Stimulation of Juvenile hormone biosynthesis by the corpora allata of adult *Aedes aegypti* *in vitro*: effect of farnesoic acid and *Aedes* allatotropin. J. Experimental Biology, 206: 1825-1832.
30. Noriega, F.G., Edgar, K.A., Bechet, R. and Wells, M.A. (2002) Midgut exopeptidase activities in *Aedes aegypti* are induced by blood feeding. J. Insect Physiology 48: 65-72.
31. Sanborn, A.F., Noriega, F.G. and Phillips, P.K (2002) Thermoregulation in the cicada *Platypedia putnami* variety *lutea* (Homoptera: Tibicinidae) and a test of a crepitation hypothesis. J. Thermal Biology 27(5):  365-369.
32. Noriega, F.G., K. A. Edgar, D. K. Shah and M. A. Wells. (2001) Neuroendocrine factors affecting the steady state levels of early trypsin mRNA in *Aedes aegypti* . J. Insect Physiology. 47, 515-522.
33. Edgar, K., Noriega, F.G., B. C. Bonning and M. A. Wells (2000). Recombinant juvenile hormone esterase, an effective tool to modify juvenile hormone-dependent expression of the early trypsin gene in mosquitoes. Insect Molec. Biol*.* 9, 27-31.
34. M.J. Edwards, L.A. Moskalyk, M. Donelly-Doman, M. Vlaskova, Noriega, F.G., V.K.Walker and M. Jacobs-Lorena. (2000) Characterization of a carboxypeptidase A gene from the mosquito, *Aedes aegypti* Insect Molec. Biol. 9, 33-38.

D. Research Support

Ongoing Research Support

R01 AI045545-17 Noriega (PI) 05/31/15-06/01/20

Regulation of Juvenile Hormone titers in mosquitoes

The goal is to study the mechanisms of regulation of juvenile hormone synthesis by allatoregulatory peptides.

Role: PI. Total Cost: $ 2.561.035.

Completed Research Support (selected list)

R01 AI045545-10 Noriega (PI) 06/15/10-05/31/15

Regulation of Juvenile Hormone titers in mosquitoes

The goal is to study the mechanisms of regulation of juvenile hormone synthesis by allatoregulatory peptides.

Role: PI. Total Cost: $ 2,452,997

R01 AI045545-05 Noriega (PI) . 04/01/05-06/14/10

Regulation of Juvenile Hormone titers in mosquitoes

The goal was to study the mechanisms of regulation of juvenile hormone synthesis by allatoregulatory peptides.

Role: PI. Total Cost: $1,844,038.

R01 AI045545-01 Noriega (PI) 07/01/01-06/31/04

Regulation of Juvenile Hormone titers in mosquitoes

The goal was to identify and characterize peptides that regulate juvenile hormone synthesis in mosquitoes.

Role: PI. Total Cost: $ 888,399.

R01 AI031951 Wells (PI), Noriega (coPI) 01/01/95-12/31/00

Blood digestion in vectors

The goal was to understand the regulation of trypsin synthesis in the midgut of *Aedes ae*gypti mosquitoes.

Role: coPI. Total Cost: $1,237,432.