MARIA ALEJANDRA BRAVO DE LA PARRA

Datos Generales

Nombre: MARIA ALEJANDRA BRAVO DE LA PARRA

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Nombramientos

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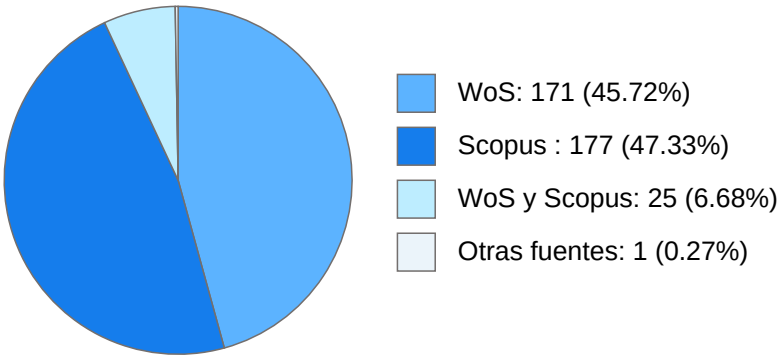
Estímulos, programas, premios y reconocimientos

SNI III - VIGENTE
PRIDE D - 2024
RDUNJA Investigación en ciencias naturales 2000

MARIA ALEJANDRA BRAVO DE LA PARRA

DOCUMENTOS EN REVISTAS

Histórico de Documentos



#	Título	Autores	Revista	Año
1	Enhancing Bacillus thuringiensis Cry8Ea1 toxicity: Insights into protease sensitivity for the evolutionary adaptation of Cry toxins to insect hosts	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Tan S. et al.	INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES	2025
2	Sequestosome 1 in Autophagy Regulates a Defense Response of the Striped Stem Borer to the Cry9Aa Protein	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Sirui Li et al.	JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY	2025
3	Cry11Aa toxin of Bacillus thuringiensis interactions with intracellular organelles in insect gut implicating actin depolymerization, massive endocytosis, and vesicle secretion	ADAN OSWALDO GUERRERO CARDENAS SABINO PACHECO GUILLEN JORGE FELIX SANCHEZ QUINTANA et al.	INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES	2025
4	JAK/STAT signaling regulated intestinal regeneration defends insect pests against pore-forming toxins produced by Bacillus thuringiensis	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Zeyu Wang et al.	PLOS PATHOGENS	2024

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5	Silencing Ditylenchus destructor cathepsin L-like cysteine protease has negative pleiotropic effect on nematode ontogenesis	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Huang G. et al.	SCIENTIFIC REPORTS	2024
6	CRISPR-Cas9 knockout of membrane-bound alkaline phosphatase or cadherin does not confer resistance to Cry toxins in Aedes aegypti	SABINO PACHECO GUILLEN JORGE FELIX SANCHEZ QUINTANA ISABEL GOMEZ GOMEZ et al.	PLOS NEGLECTED TROPICAL DISEASES	2024
7	Transcriptional regulation of Cry2Ab toxin receptor ABCA2 gene in insects involves GATAe and splicing of a 5' UTR intron	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Wang H. et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2024
8	Insights into the structural changes that trigger receptor binding upon proteolytic activation of Bacillus thuringiensis Vip3Aa insecticidal protein	ISABEL GOMEZ GOMEZ BLANCA INES GARCIA GOMEZ ADAN OSWALDO GUERRERO CARDENAS et al.	PLOS PATHOGENS	2024
9	Performance insights into spray-dryer microencapsulated Bacillus thuringiensis cry pesticidal proteins with gum arabic and maltodextrin for effective pest control	ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	APPLIED MICROBIOLOGY AND BIOTECHNOLOGY	2024
10	Bacillus thuringiensis Cry9Aa Insecticidal Protein Domain I Helices a3 and a4 Are Two Core Regions Involved in Oligomerization and Toxicity	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA He X. et al.	JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY	2024
11	Mode of action of Bacillus thuringiensis Cry pesticidal proteins	MARIA ALEJANDRA BRAVO DE LA PARRA SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ et al.	ADV INSECT PHYSIOL	2023
12	A major conformational change of N-terminal helices of Bacillus thuringiensis Cry1Ab insecticidal protein is necessary for membrane insertion and toxicity	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ et al.	FEBS JOURNAL	2023
13	Development of an Online Genome Sequence Comparison Resource for Bacillus cereus sensu lato Strains Using the Efficient Composition Vector Method	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Kui Wang et al.	Toxins	2023
14	Helicoverpa armigera GATAe transcriptional factor regulates the expression of Bacillus thuringiensis Cry1Ac receptor gene ABCC2 by its interplay with additional transcription factors	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Wei W. et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2023

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15	Aminopeptidase MNP-1 triggers intestine protease production by activating daf-16 nuclear location to degrade pore-forming toxins in Caenorhabditis elegans	MARIA ALEJANDRA BRAVO DE LA PARRA Feng Chen Cuiyun Pang et al.	PLOS PATHOGENS	2023
16	Structural changes upon membrane insertion of the insecticidal pore-forming toxins produced by Bacillus thuringiensis	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ LUCERO YAZMIN RIVERA NAJERA et al.	Frontiers In Insect Science	2023
17	Mining versus in vitro evolution for the selection of novel microbial insecticidal proteins	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ	MICROBIAL BIOTECHNOLOGY	2022
18	A single transcription factor facilitates an insect host combating Bacillus thuringiensis infection while maintaining fitness	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Guo Z. et al.	NATURE COMMUNICATIONS	2022
19	Adoption of Bacillus thuringiensis-based biopesticides in agricultural systems and new approaches to improve their use in Brazil	MARIA ALEJANDRA BRAVO DE LA PARRA do Nascimento J. Cristina Goncalves K. et al.	BIOLOGICAL CONTROL	2022
20	A versatile contribution of both aminopeptidases N and ABC transporters to Bt Cry1Ac toxicity in the diamondback moth	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Dan Sun et al.	BMC BIOLOGY	2022
21	Bacillus thuringiensis Cry1Ac Protoxin and Activated Toxin Exert Differential Toxicity Due to a Synergistic Interplay of Cadherin with ABCC Transporters in the Cotton Bollworm	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Liao C. et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2022
22	Whole Genome Sequencing Analysis of Bacillus thuringiensis GR007 Reveals Multiple Pesticidal Protein Genes	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ et al.	FRONTIERS IN MICROBIOLOGY	2021
23	Bacillus thuringiensis Cry1Ab Domain III beta-16 Is Involved in Binding to Prohibitin, Which Correlates with Toxicity against Helicoverpa armigera (Lepidoptera: Noctuidae)	ISABEL GOMEZ GOMEZ SABINO PACHECO GUILLEN MARIO SOBERON CHAVEZ et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2021
24	Bacillus thuringiensis cry toxin triggers autophagy activity that may enhance cell death	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Yongbo Yang et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2021

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25	Two ABC transporters are differentially involved in the toxicity of two Bacillus thuringiensis Cry1 toxins to the invasive crop-pest Spodoptera frugiperda (J. E. Smith)	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Minghui Jin et al.	PEST MANAGEMENT SCIENCE	2021
26	In vivo nanoscale analysis of the dynamic synergistic interaction of Bacillus thuringiensis Cry11Aa and Cyt1Aa toxins in Aedes aegypti	ADAN OSWALDO GUERRERO CARDENAS JORGE GODINEZ SANCHEZ SABINO PACHECO GUILLEN et al.	PLOS PATHOGENS	2021
27	Nutrient conditions determine the localization of Bacillus thuringiensis Vip3Aa protein in the mother cell compartment	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Wang Z. et al.	MICROBIAL BIOTECHNOLOGY	2021
28	Encapsulation Strategies for Bacillus thuringiensis: From Now to the Future	MARIA ALEJANDRA BRAVO DE LA PARRA Jhones L. de Oliveira Leonardo Fernandes Fraceto et al.	JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY	2021
29	SfABCC2 transporter extracellular loops 2 and 4 are responsible for the Cry1Fa insecticidal specificity against Spodoptera frugiperda	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Liu Y. et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2021
30	Rapid spread of a densovirus in a major crop pest following wide-scale adoption of Bt-cotton in China	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Yutao Xiao et al.	eLife	2021
31	Bacterial Toxins Active against Mosquitoes: Mode of Action and Resistance	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Silva-Filha M.H.N.L. et al.	Toxins	2021
32	Synergistic resistance of Helicoverpa armigera to Bt toxins linked to cadherin and ABC transporters mutations	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Dandan Zhang et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2021
33	The regulation landscape of MAPK signaling cascade for thwarting Bacillus thuringiensis infection in an insect host	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Guo Z. et al.	PLOS PATHOGENS	2021
34	Systemic mitochondrial disruption is a key event in the toxicity of bacterial pore-forming toxins to Caenorhabditis elegans	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Jianwei Shi et al.	ENVIRONMENTAL MICROBIOLOGY	2021

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35	Coexistence of cry9 with the vip3A Gene in an Identical Plasmid of Bacillus thuringiensis Indicates Their Synergistic Insecticidal Toxicity	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Zeyu Wang et al.	JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY	2020
36	GATAe transcription factor is involved in Bacillus thuringiensis Cry1Ac toxin receptor gene expression inducing toxin susceptibility	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Wei W. et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2020
37	Comprehensive analysis of Cry1Ac protoxin activation mediated by midgut proteases in susceptible and resistant Plutella xylostella (L.)	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Guo Z. et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2020
38	Reduced Expression of a Novel Midgut Trypsin Gene Involved in Protoxin Activation Correlates with Cry1Ac Resistance in a Laboratory-Selected Strain of Plutella xylostella (L.)	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Gong L. et al.	Toxins	2020
39	Identification of Cry1Ah-binding proteins through pull down and gene expression analysis in Cry1Ah-resistant and susceptible strains of Ostrinia furnacalis	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Shabbir M.Z. et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2020
40	Oligomerization is a key step for Bacillus thuringiensis Cyt1Aa insecticidal activity but not for toxicity against red blood cells	JORGE GODINEZ SANCHEZ MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2020
41	Functional Bacillus thuringiensis Cyt1Aa Is Necessary To Synergize Lysinibacillus sphaericus Binary Toxin (Bin) against Bin-Resistant and -Refractory Mosquito Species	SABINO PACHECO GUILLEN MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2020
42	The CRISPR-Cas systems were selectively inactivated during evolution of Bacillus cereus group for adaptation to diverse environments	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Ziqiang Zheng et al.	ISME JOURNAL	2020
43	The Cadherin Protein Is Not Involved in Susceptibility toBacillus thuringiensisCry1Ab or Cry1Fa Toxins inSpodoptera frugiperda	ISABEL GOMEZ GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	Toxins	2020

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44	The Cyt1Aa toxin fromBacillus thuringiensisinserts into target membranes via different mechanisms in insects, red blood cells, and lipid liposomes	SABINO PACHECO GUILLEN MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	JOURNAL OF BIOLOGICAL CHEMISTRY	2020
45	Characterization of two novel bacillus thuringiensis Cry8 toxins reveal differential specificity of protoxins or activated toxins against chrysomeloidea coleopteran superfamily	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Shu C. et al.	Toxins	2020
46	Rearrangement of N-terminal a-helices of bacillus thuringiensis Cry1Ab toxin essential for oligomer assembly and toxicity	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ JORGE GODINEZ SANCHEZ et al.	Toxins	2020
47	Bacillus thuringiensis Cry1Ab Domain III ß-22 Mutants with Enhanced Toxicity to Spodoptera frugiperda (J. E. Smith)	ISABEL GOMEZ GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2020
48	Bacillus thuringiensis targets the host intestinal epithelial junctions for successful infection of Caenorhabditis elegans	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Wan L. et al.	ENVIRONMENTAL MICROBIOLOGY	2019
49	The Cadherin Cry1Ac Binding-Region is Necessary for the Cooperative Effect with ABCC2 Transporter Enhancing Insecticidal Activity of Bacillus thuringiensis Cry1Ac Toxin	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Ma Y. et al.	Toxins	2019
50	Insect hsp90 chaperone assists bacillus thuringiensis cry toxicity by enhancing protoxin binding to the receptor and by protecting protoxin from gut protease degradation	BLANCA INES GARCIA GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	Mbio	2019
51	Engineering Bacillus thuringiensis Cyt1Aa toxin specificity from dipteran to lepidopteran toxicity	ISABEL GOMEZ GOMEZ SABINO PACHECO GUILLEN HUMBERTO FLORES SOTO et al.	SCIENTIFIC REPORTS	2018
52	Helix alpha-3 inter-molecular salt bridges and conformational changes are essential for toxicity of Bacillus thuringiensis 3D-Cry toxin family	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ JORGE FELIX SANCHEZ QUINTANA et al.	SCIENTIFIC REPORTS	2018

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53	A single amino acid polymorphism in ABCC2 loop 1 is responsible for differential toxicity of Bacillus thuringiensis Cry1Ac toxin in different Spodoptera (Noctuidae) species	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Liu L. et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2018
54	BIODIVERSITY OF CRY TOXINS PRODUCED BY BACILLUS THURINGIENSIS AND EVOLUTION OF RESISTANCE TO THESE TOXINS IN DIFFERENT INSECT PESTS	MARIA ALEJANDRA BRAVO DE LA PARRA	Toxicon	2018
55	Specific binding between Bacillus thuringiensis Cry9Aa and Vip3Aa toxins synergizes their toxicity against Asiatic rice borer (Chilo suppressalis)	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ et al.	JOURNAL OF BIOLOGICAL CHEMISTRY	2018
56	Spodoptera frugiperda (J. E. Smith) aminopeptidase N1 is a functional receptor of the Bacillus thuringiensis Cry1Ca toxin	ISABEL GOMEZ GOMEZ RICARDO ALFREDO GRANDE CANO JORGE FELIX SANCHEZ QUINTANA et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2018
57	Enhancement of Bacillus thuringiensis Cry1Ab and Cry1Fa toxicity to Spodoptera frugiperda by domain III mutations indicates there are two limiting steps in toxicity as defined by receptor binding and protein stability	ISABEL GOMEZ GOMEZ JORGE GODINEZ SANCHEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2018
58	Susceptible and mCry3A resistant corn rootworm larvae killed by a non-hemolytic Bacillus thuringiensis Cyt1Aa mutant	MARIA ALEJANDRA BRAVO DE LA PARRA Jazmin A. Lopez-Diaz Takashi Yamamoto et al.	SCIENTIFIC REPORTS	2018
59	Identification of midgut membrane proteins from different instars of Helicoverpa armigera (Lepidoptera: Noctuidae) that bind to Cry1Ac toxin	ISABEL GOMEZ GOMEZ JORGE FELIX SANCHEZ QUINTANA MARIO SOBERON CHAVEZ et al.	PLOS ONE	2018
60	Cell lines as models for the study of Cry toxins from Bacillus thuringiensis	MARIO SOBERON CHAVEZ BLANCA INES GARCIA GOMEZ JORGE FELIX SANCHEZ QUINTANA et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2018
61	Characterization of the Cry1Ah resistance in Asian corn Borer and its cross-resistance to other Bacillus thuringiensis toxins	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Shabbir M.Z. et al.	SCIENTIFIC REPORTS	2018

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62	Cry64Ba and Cry64Ca, two ETX/MTX2-type Bacillus thuringiensis insecticidal proteins active against hemipteran pests	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Liu Y. et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2018
63	Identification of Bacillus thuringiensis Cry1AbMod binding-proteins from Spodoptera frugiperda	BLANCA INES GARCIA GOMEZ ISABEL GOMEZ GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	Peptides	2017
64	Identification of Bacillus thuringiensis Cry1AbMod binding-proteins from Spodoptera frugiperda	ISABEL GOMEZ GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	Peptides	2017
65	Identification of a Bacillus thuringiensis Surface Layer Protein with Cytotoxic Activity against MDA-MB-231 Breast Cancer Cells	MARIA ALEJANDRA BRAVO DE LA PARRA Rubio, V.P. Olmos, J.	JOURNAL OF MICROBIOLOGY AND BIOTECHNOLOGY	2017
66	Identification of Aminopeptidase-N2 as a Cry2Ab binding protein in Manduca sexta	BLANCA INES GARCIA GOMEZ SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ et al.	Peptides	2017
67	An intramolecular salt bridge in Bacillus thuringiensis Cry4Ba toxin is involved in the stability of helix α-3, which is needed for oligomerization and insecticidal activity	SABINO PACHECO GUILLEN ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2017
68	Transgenic cotton co-expressing chimeric Vip3AcAa and Cry1Ac confers effective protection against Cry1Ac-resistant cotton bollworm	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Chen, Wen-bo et al.	TRANSGENIC RESEARCH	2017
69	Insecticidal specificity of Cry1Ah to Helicoverpa armigera is determined by binding of APN1 via domain II loops 2 and 3	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Zhou, Z. et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2017
70	ABCC2 is associated with Bacillus thuringiensis Cry1Ac toxin oligomerization and membrane insertion in diamondback moth	JORGE FELIX SANCHEZ QUINTANA ISABEL GOMEZ GOMEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	SCIENTIFIC REPORTS	2017
71	A single point mutation resulting in cadherin mislocalization underpins resistance against bacillus thuringiensis toxin in cotton bollworm	SABINO PACHECO GUILLEN MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	JOURNAL OF BIOLOGICAL CHEMISTRY	2017

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72	FOXA transcriptional factor modulates insect susceptibility to Bacillus thuringiensis Cry1Ac toxin by regulating the expression of toxin-receptor ABCC2 and ABCC3 genes	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Li, J. et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2017
73	Holotrichia oblita Midgut Proteins That Bind to Bacillus thuringiensis Cry8-Like Toxin and Assembly of the H-oblita Midgut Tissue Transcriptome	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Jiang, Jian et al.	APPLIED AND ENVIRONMENTAL MICROBIOLOGY	2017
74	Toxicity of Cry1A toxins from Bacillus thuringiensis to CF1 cells does not involve activation of adenylate cyclase/PKA signaling pathway	ROBERTO CARLOS MUÑOZ GARAY MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2017
75	Role of UPR Pathway in Defense Response of Aedes aegypti against Cry11Aa Toxin from Bacillus thuringiensis (vol 14, 8467, 2013)	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Bedoya-Perez, Leidy P. et al.	INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES	2016
76	Mitochondrial markers to distinguish Spodoptera frugiperda populations associated with corn and cotton crops	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Queiroz, Paulo Roberto et al.	PESQUISA AGROPECUARIA BRASILEIRA	2016
77	Identification of ABCC2 as a binding protein of Cry1Ac onbrush border membrane vesicles from Helicoverpa armigera by an improved pull-down assay	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Zhou, Zishan et al.	MICROBIOLOGY OPEN	2016
78	Resistance to Bacillus thuringiensis Mediated by an ABC Transporter Mutation Increases Susceptibility to Toxins from Other Bacteria in an Invasive Insect	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Xiao, Yutao et al.	PLOS PATHOGENS	2016
79	Identification of an alkaline phosphatase as a putative Cry1Ac binding protein in Ostrinia furnacalis (Guenée)	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Jin, Tingting et al.	PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY	2016
80	Oligomerization of Cry9Aa in solution without receptor binding, is not related with insecticidal activity	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Fang, Longfa et al.	Electronic Journal Of Biotechnology	2016
81	Mitochondrial markers to distinguish Spodoptera frugiperda populations associated with corn and cotton crops	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Queiroz, P.R. et al.	PESQUISA AGROPECUARIA BRASILEIRA	2016

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82	Variability of Bacillus thuringiensis Strains by ERIC-PCR and Biofilm Formation	Karina Garcia MARIA ALEJANDRA BRAVO DE LA PARRA FRANCISCO JAVIER DIAZ GARCIA et al.	CURRENT MICROBIOLOGY	2015
83	Evidence of field-evolved resistance of Spodoptera frugiperda to Bt corn expressing Cry1F in Brazil that is still sensitive to modified Bt toxins	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Monnerat, Rose et al.	PLOS ONE	2015
84	Identification of Bacillus thuringiensis Cry3Aa toxin domain II loop 1 as the binding site of Tenebrio molitor cadherin repeat CR12	Fernando ZunigaNavarrete ISABEL GOMEZ GOMEZ Itzel Amaro et al.	INSECT BIOCHEMISTRY AND MOLECULAR BIOLOGY	2015
85	Bacillus thuringiensis Cry1AbMod toxin counters tolerance associated with low cadherin expression but not that associated with low alkaline phosphatase expression in Manduca sexta	ISABEL GOMEZ GOMEZ Biviana Flores Escobar MARIA ALEJANDRA BRAVO DE LA PARRA et al.	Peptides	2015
86	Nitric oxide participates in the toxicity of Bacillus thuringiensis Cry1Ab toxin to kill Manduca sexta larvae	Carolina Chavez Benito RecioTotoro Biviana FloresEscobar et al.	Peptides	2015
87	Assembling of Holotrichia parallela (dark black chafer) midgut tissue transcriptome and identification of midgut proteins that bind to Cry8Ea toxin from Bacillus thuringiensis	MARIO SOBERON CHAVEZ MARIA ALEJANDRA BRAVO DE LA PARRA Shu, Changlong et al.	APPLIED MICROBIOLOGY AND BIOTECHNOLOGY	2015
88	Dual mode of action of Bt proteins: Protoxin efficacy against resistant insects	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ Tabashnik, Bruce E. et al.	SCIENTIFIC REPORTS	2015
89	Role of the ABCC2 transporter in the mode of action of the Bacillus thuringiensis Cry1Ac toxin in the Diamond Back Moth Plutella xylostella	Josue Ocelotl JORGE FELIX SANCHEZ QUINTANA Raquel Arroyo et al.	PROTEIN SCIENCE	2015
90	``Study of Bacillus thuringiensis Cry1Ab and Cry1Ac protoxins interaction with cadherin-like receptor from Manduca sexta"	Arlen PenaCardena MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ et al.	PROTEIN SCIENCE	2015
91	Improvement and efficient display of Bacillus thuringiensis toxins on M13 phages and ribosomes	SABINO PACHECO GUILLEN Emiliano Canton Fernando ZunigaNavarrete et al.	AMB Express	2015
92	Binding and oligomerization of modified and native Bt toxins in resistant and susceptible Pink Bollworm	Josue Ocelotl JORGE FELIX SANCHEZ QUINTANA Raquel Arroyo et al.	PLOS ONE	2015

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93	Transcriptional cellular responses in midgut tissue of Aedes aegypti larvae following intoxication with Cry11Aa toxin from Bacillus thuringiensis	Pablo Emiliano Canton MARIA DE LOS ANGELES CANCINO RODEZNO MARIO SOBERON CHAVEZ et al.	Bmc Genomics	2015
94	Erratum for the Report: "Engineering modified Bt toxins to counter insect resistance" (Science (2007) (1640-1642))	MARIO SOBERON CHAVEZ LILIANA PARDO LOPEZ ISABEL GOMEZ GOMEZ et al.	Science	2014
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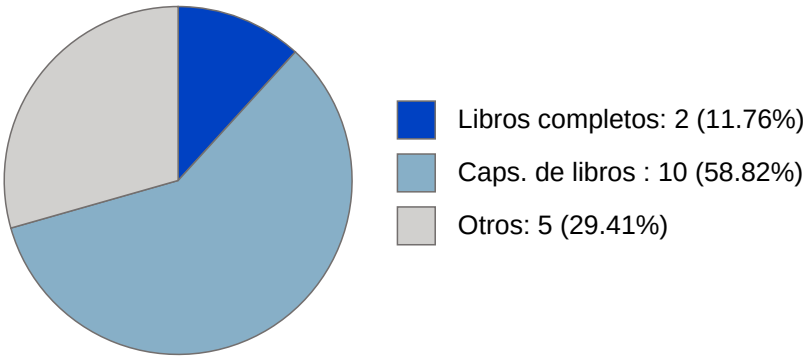

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12	Different models of the mode of action of Bt 3d-Cry toxins	MARIA ALEJANDRA BRAVO DE LA PARRA ISABEL GOMEZ GOMEZ MARIO SOBERON CHAVEZ et al.	Capítulo de un Libro	2015	9781780644370
13	Role of GPI-anchored membrane receptors in the mode of action of Bacillus thuringiensis Cry toxins	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ ISABEL GOMEZ GOMEZ	Capítulo de un Libro	2012	9789535100508
14	Towards a healthy control of insect pest: Potential use of Microbial insecticides	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ	Capítulo de un Libro	2011	9781849731492

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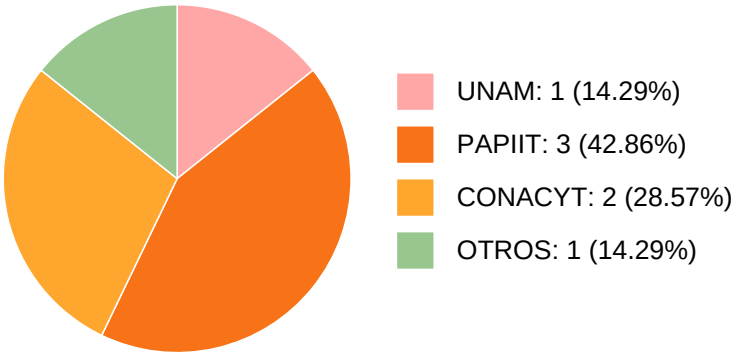
15	Pore Formation by Cry Toxins	MARIO SOBERON CHAVEZ LILIANA PARDO LOPEZ ROBERTO CARLOS MUÑOZ GARAY et al.	Article	2010	9781441963260
16	Defense and death responses to pore forming toxins	Angeles Cancino Rodezno HELENA PORTA DUCOING MARIO SOBERON CHAVEZ et al.	Review	2010	9781907284489
17	Bacillus thuringiensis Mechanisms and Use with addendum 2010	MARIA ALEJANDRA BRAVO DE LA PARRA MARIO SOBERON CHAVEZ	Capítulo de un Libro	2010	9780123814494

MARIA ALEJANDRA BRAVO DE LA PARRA

PARTICIPACIÓN EN PROYECTOS

Histórico de participación en proyectos



#	Nombre	Participantes	Fuente	Fecha inicio	Fecha fin
1	Ingeniería de la toxina Cyt1Aa para inhibir su actividad hemolítica y optimizar su sinergismo con toxinas Cry de Bacillus thuringiensis	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos CONACYT	17-12-2014	01-03-2018
2	Mecanismos moleculares de la especificidad de las toxinas Cry de Bacillus thuringiensis.	MARIA ALEJANDRA BRAVO DE LA PARRA	Presupuesto de la UNAM asignado a la Dependencia	01-01-2014	30-06-2021
3	Desarrollo de nuevas toxinas insecticidas de Bacillus thuringiensis contra la plagas invasivas de cultivos primordiales para México como maíz y algodón	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos CONACYT	05-04-2016	12-05-2018
4	Desarrollo de nuevas toxinas insecticidas de Bacillus thuringiensis contra gusano cogollero-Spodoptera frugiperda, plaga principal de cultivos de maíz mexicanos	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos PAPIIT	01-01-2016	29-03-2018

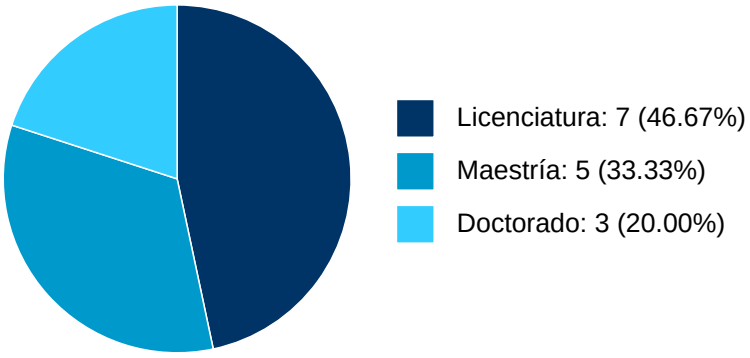
MARIA ALEJANDRA BRAVO DE LA PARRA

5	Análisis de la respuesta en larvas de insectos ante el ataque de toxinas Cry de Bacillus thuringiensis.	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos PAPIIT	01-01-2019	31-12-2021
6	Análisis funcional de transportadores ABC de lepidópteros como receptores de toxinas Cry insecticidas de Bacillus thuringiensis	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos PAPIIT	01-01-2022	31-12-2024
7	Análisis in vivo del mecanismo de acción de la toxina Cry de Bacillus thuringiensis y de las respuestas inducidas en larvas de insectos .	MARIA ALEJANDRA BRAVO DE LA PARRA	Recursos CONAHCyT	27-09-2023	30-11-2025

MARIA ALEJANDRA BRAVO DE LA PARRA

PARTICIPACIÓN EN TESIS

Histórico de Colaboraciones en Tesis



#	Título del documento	Tipo de Tesis	Sinodales	Autores	Entidad	Año
1	"Optimización de la mutagénesis en los genes abca2, abcb1, abcc2 y phb2 de Aedes aegypti utilizando CRISPR-Cas9"	Tesis de Maestría	MARIA ALEJANDRA BRAVO DE LA PARRA,	Gómez Hernández, Juan Ulises,	Instituto de Biotecnología,	2023
2	Construcción de variantes de la toxina Cyt1Aa de Bacillus thuringiensis para migrar su toxicidad hacia insectos lepidópteros	Tesis de Doctorado	MARIA ALEJANDRA BRAVO DE LA PARRA,	Torres Quintero, Mary Carmen,	Instituto de Biotecnología,	2018
3	Estudio de estrategias para la clonación y expresión de toxinas cry1amod de bacillus thuringiensis	Tesis de Maestría	MARIA ALEJANDRA BRAVO DE LA PARRA,	Martínez de Castro Jiménez, Diana Laura,	Instituto de Biotecnología,	2015
4	Optimización de la toxina cry1acmod de bacillus thuringiensis contra insectos lepidópteros	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Martínez de Castro Jiménez, Diana Laura,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2014
5	Análisis molecular del mecanismo de acción de toxinas Cyt activas contra mosquitos	Tesis de Maestría	MARIA ALEJANDRA BRAVO DE LA PARRA,	López Díaz, Jazmín Alaide,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2013

MARIA ALEJANDRA BRAVO DE LA PARRA

6	Mecanismos de defensa en el insecto Aedes aegypti hacia el ataque de la toxina Cry11Aa de Bacillus thuringiensis	Tesis de Maestría	MARIA ALEJANDRA BRAVO DE LA PARRA,	Bedoya Pérez, Leidy Patricia,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2011
7	La dominancia negativa como evidencia de hetero-oligomerización entre diferentes toxinas Cry de Bacillus thuringiensis	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Carmona León, Daniela,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2011
8	Caracterización del espectro de acción de la toxina Cry1 A bMod, activa contra insectos resistentes, y su comparación con la toxina convencional Cry1Ab de Bacillus thuringiensis	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Toro de León, Gerardo del,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2010
9	Análisis del fenotipo de dominancia negativa presentado por algunas mutantes de la hélice a-4 de las toxinas Cry1A	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Zavala Romero, Luis Enrique,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2010
10	Análisis de unión de toxinas Cry1A silvestres y modificadas en larvas resistentes y sensibles a toxinas Cry de Pectinophora gossypiella y Plutella xylostella	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Arroyo Loranca, Raquel Gabriela,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2009
11	Estudio del proceso de oligomerización de toxinas Cry1A producidas por Bacillus thuringiensis	Tesis de Doctorado	MARIA ALEJANDRA BRAVO DE LA PARRA,	Jiménez Juárez, Nuria,	Coordinación de Estudios de Posgrado, Instituto de Biotecnología,	2008
12	Participacion de la ruta p38 MAPK en la respuesta a Cry11Aa de Bacillus thuringiensis en Anopheles gambiae	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	Villaseñor Solorio, Roberto,		2007

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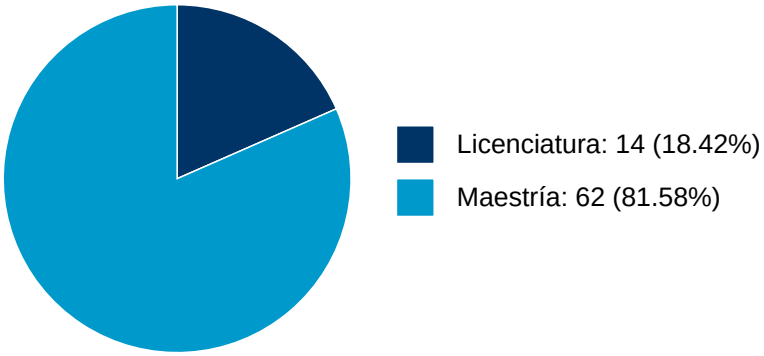
13	Bases moleculares del sinergismo entre las [delta]-endotoxinas Cry11Aa y Cyt1Aa de Bacillus thuringiensis subespecie israelensis	Tesis de Doctorado	MARIA ALEJANDRA BRAVO DE LA PARRA,	Pérez Ortega, Claudia Dolores,	2007
14	Papel secuencial de Bt-R1 y aminopeptidasa N en el mecanismo de acción de las toxinas Cry de Bacillus thuringiensis	Tesis de Maestría	MARIA ALEJANDRA BRAVO DE LA PARRA,	López Gorostieta, Idalia,	2006
15	Silenciamiento de Bt - R1 y aminopeptidasa N de Manduca sexta, por medio de RNA de doble cadena y su papel como receptores de las toxinas Cry de Bacillus thuringiensis	Tesis de Licenciatura	MARIA ALEJANDRA BRAVO DE LA PARRA,	López Gorostieta, Idalia,	2004

MARIA ALEJANDRA BRAVO DE LA PARRA

DOCENCIA IMPARTIDA

Histórico de docencia



#	Nivel titulación	Asignatura	Entidad	Alumnos	Semestre
1	Maestría	SEMINARIO DE INVESTIGACIÓN III	Instituto de Biotecnología	1	2023-2
2	Maestría	TRABAJO DE INVESTIGACIÓN III	Instituto de Biotecnología	1	2023-2
3	Maestría	SEMINARIO DE INVESTIGACIÓN II	Instituto de Biotecnología	1	2023-1
4	Maestría	TRABAJO DE INVESTIGACIÓN II	Instituto de Biotecnología	1	2023-1
5	Maestría	CURSO IV	Instituto de Biotecnología	0	2022-2
6	Maestría	TRABAJO DE INVESTIGACIÓN I	Instituto de Biotecnología	1	2022-2
7	Maestría	CURSO III	Instituto de Biotecnología	2	2022-2
8	Maestría	SEMINARIO DE INVESTIGACIÓN III	Instituto de Biotecnología	1	2022-1
9	Maestría	TRABAJO DE INVESTIGACIÓN III	Instituto de Biotecnología	1	2022-1
10	Maestría	SEMINARIO DE INVESTIGACIÓN II	Instituto de Biotecnología	1	2021-2
11	Maestría	TRABAJO DE INVESTIGACIÓN II	Instituto de Biotecnología	1	2021-2
12	Maestría	TRABAJO DE INVESTIGACIÓN I	Instituto de Biotecnología	1	2021-1
13	Maestría	CURSO III	Instituto de Biotecnología	1	2020-1
14	Maestría	CURSO IV	Instituto de Biotecnología	1	2020-1
15	Maestría	CURSO IV	Instituto de Biotecnología	1	2018-2
16	Maestría	CURSO III	Instituto de Biotecnología	1	2017-2
17	Maestría	CURSO IV	Instituto de Biotecnología	1	2017-2
18	Maestría	CURSO IV	Instituto de Biotecnología	2	2015-2
19	Maestría	CURSO IV	Instituto de Biotecnología	1	2014-1
20	Maestría	SEMINARIO DE INVESTIGACION III	Instituto de Biotecnología	1	2013-2
21	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2013-2
22	Maestría	CURSO IV	Instituto de Biotecnología	3	2013-1
23	Maestría	CURSO III	Instituto de Biotecnología	2	2013-1

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24	Maestría	SEMINARIO DE INVESTIGACION II	Instituto de Biotecnología	1	2013-1
25	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2013-1
26	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2012-2
27	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2012-2
28	Maestría	SEMINARIO DE INVESTIGACION III	Instituto de Biotecnología	1	2012-2
29	Maestría	SEMINARIO DE INVESTIGACION III	Instituto de Biotecnología	1	2012-1
30	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2012-1
31	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2012-1
32	Maestría	SEMINARIO DE INVESTIGACION II	Instituto de Biotecnología	1	2012-1
33	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2012-1
34	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2011-2
35	Maestría	SEMINARIO DE INVESTIGACION III	Instituto de Biotecnología	1	2011-2
36	Maestría	SEMINARIO DE INVESTIGACION II	Instituto de Biotecnología	1	2011-2
37	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2011-2
38	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2011-2
39	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2011-2
40	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2011-1
41	Maestría	SEMINARIO DE INVESTIGACION I	Instituto de Biotecnología	1	2011-1
42	Maestría	SEMINARIO DE INVESTIGACION II	Instituto de Biotecnología	1	2011-1
43	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2011-1
44	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2011-1
45	Maestría	CURSO IV	Instituto de Biotecnología	1	2011-1
46	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2011-1
47	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2010-2
48	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2010-2
49	Licenciatura	TRABAJO DE INVESTIGACION 4	Instituto de Biotecnología	1	2010-2
50	Licenciatura	TRABAJO DE INVESTIGACION 5	Instituto de Biotecnología	1	2010-2
51	Licenciatura	TRABAJO DE INVESTIGACION 6	Instituto de Biotecnología	1	2010-2
52	Licenciatura	TOPICO SELECTO 3	Instituto de Biotecnología	1	2010-2
53	Licenciatura	TOPICO SELECTO 4	Instituto de Biotecnología	1	2010-2
54	Licenciatura	SEMINARIO DE INVESTIGACION 2	Instituto de Biotecnología	1	2010-2
55	Maestría	SEMINARIO DE INVESTIGACION I	Instituto de Biotecnología	1	2010-2
56	Maestría	SEMINARIO DE INVESTIGACION III	Instituto de Biotecnología	1	2010-2
57	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2010-2
58	Licenciatura	TRABAJO DE INVESTIGACION 1	Instituto de Biotecnología	1	2010-1
59	Licenciatura	TRABAJO DE INVESTIGACION 2	Instituto de Biotecnología	1	2010-1
60	Licenciatura	TRABAJO DE INVESTIGACION 3	Instituto de Biotecnología	1	2010-1
61	Licenciatura	TOPICO SELECTO 1	Instituto de Biotecnología	1	2010-1
62	Licenciatura	TOPICO SELECTO 2	Instituto de Biotecnología	1	2010-1
63	Licenciatura	SEMINARIO DE INVESTIGACION 1	Instituto de Biotecnología	1	2010-1
64	Maestría	SEMINARIO DE INVESTIGACION II	Instituto de Biotecnología	1	2010-1
65	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2010-1
66	Maestría	SEMINARIO DE INVESTIGACION I	Instituto de Biotecnología	1	2009-2

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67	Maestría	TRABAJO DE INVESTIGACION I	Instituto de Biotecnología	1	2009-2
68	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2009-2
69	Maestría	CURSO III	Instituto de Biotecnología	1	2009-1
70	Maestría	CURSO III	Instituto de Biotecnología	5	2009-1
71	Maestría	CURSO IV	Instituto de Biotecnología	1	2009-1
72	Maestría	CURSO IV	Instituto de Biotecnología	2	2009-1
73	Maestría	TRABAJO DE INVESTIGACION II	Instituto de Biotecnología	1	2009-1
74	Licenciatura	FRONTERAS EN LAS CIENCS GENOMIC. II	Instituto de Biotecnología	1	2008-1
75	Licenciatura	AREA DE CONCETRACION II	Instituto de Biotecnología	1	2008-1
76	Maestría	TRABAJO DE INVESTIGACION III	Instituto de Biotecnología	1	2008-1

MARIA ALEJANDRA BRAVO DE LA PARRA

PATENTES

#	Título	Inventores	Sección	Año
1	COMPOSICION DE UN BIOINSECTICIDA PARA EL CONTROL BIOLOGICO DE LARVAS DE MOSQUITOS, VECTORES DE ENFERMEDADES, CON EFECTIVIDAD ESTABILIZADA.	MARIO SOBERON CHAVEZ, MARIA ALEJANDRA BRAVO DE LA PARRA, LEOBARDO SERRANO CARREON,	HUMAN NECESSITIES	2015
2	GENES CRY DE BACILLUS THURINGIENSIS MUTANTES Y METODOS DE USO.	MARIO SOBERON CHAVEZ, ISABEL GOMEZ GOMEZ, MARIA ALEJANDRA BRAVO DE LA PARRA,	CHEMISTRY; METALLURGYHUMAN NECESSITIES	2016

MARIA ALEJANDRA BRAVO DE LA PARRA

FUENTES DE INFORMACIÓN

Internos

#	Información	Fuente	Sistema	Periodo
1	Grupos ordinarios y resumen de historias académicas	DGAE	SIAE	2008-2025
2	Nombramientos, datos generales, estímulos, premios y reconocimientos	DGAPA	RUPA	2008-2025
3	Producción Académica	CH	Humanindex	2008-2021
4	Producción Académica	CIC	SCIC	2000-2017
5	Proyectos	DGPO	SISEPRO	2018-2022
6	Tesis	DGB	TESIUNAM	2008-2025
7	Tutorías en Posgrado	CGEP	SIIPosgrado	2008-2021

Externos

#	Información	Fuente	Sistema	Periodo
8	Documentos Indexados	Elsevier	Scopus	2008-2025
9	Documentos Indexados	Thomson Reuters	WoS	2008-2025
10	Obras con registro ISBN	INDAUTOR	Agencia ISBN	2008-2025
11	Patentes	IMPI	SIGA	2008-2024