

CURRICULUM VITAE

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Fecha de nacimiento: 17 de noviembre de 1954

Nacionalidad: Costarricense

Educación: 1961-1966: Estudios primarios en el Colegio De La Salle.
1967-1971: Estudios secundarios en el Colegio De La Salle.
1972-1977: Licenciatura en Microbiología y Química Clínica, Facultad de Microbiología, Universidad de Costa Rica.
1980-1984: Doctorado (Ph.D) en Ciencias Fisiológicas, Oklahoma State University, Stillwater, Oklahoma, USA.

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Posiciones ocupadas:

1975-1977: Asistente de Investigación, Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica.

1977-1980: Profesor Instructor, Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica.

1982-1984: Asistente de Investigación, Departamento de Ciencias Fisiológicas, Oklahoma State University, USA.

1984-1986: Profesor Invitado, Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica.

1986-1994: Profesor Asociado, Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica.

1986-1988: Director del Programa de Estudios de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica.

1987-1989: Director del Programa de Maestría en Ciencias Biomédicas CSUCA-Instituto Karolinska.

1994- : Catedrático, Instituto Clodomiro Picado, Facultad de Microbiología, Universidad de Costa Rica.

1988-1996: Director, Instituto Clodomiro Picado, Universidad de Costa Rica.

1999- 2005, 2009-2012: Coordinador, División de Investigación, Instituto Clodomiro Picado, Universidad de Costa Rica.

2009-2011 y 2013-2015: Subdirector, Instituto Clodomiro Picado, Universidad de Costa Rica.

Pasantías internacionales:

Noviembre 1996-Febrero 1997: Pasantía en el Laboratorio de Farmacología del Instituto Butantan, Sao Paulo, Brasil.

Noviembre del 2000-Febrero del 2001: Pasantía en el Laboratorio de Farmacología del Instituto Butantan, Sao Paulo, Brasil.

Honores y distinciones:

1981: Premio Nacional de Ciencia y Tecnología "Dr. Clodomiro Picado".

1980-1984: Beca para disfrutar estudios de posgrado en Oklahoma State University, USA.

1983: Miembro de la Sociedad Internacional de Toxinología (IST).

1990: Premio TWAS-CONICIT para científicos jóvenes en la rama de Biología.

1992: Miembro de número de la Academia Nacional de Ciencias de Costa Rica.

1997: Premio Sven Brohult, otorgado por la International Foundation for Science por los trabajos efectuados en el tema de los venenos de serpientes y de los antivenenos.

1998: Premio Ancora (Costa Rica) en el área de ciencias.

2006-2009: Coordinador del proyecto CYTED de laboratorios públicos de producción y control de calidad de antivenenos en América Latina.

2007: Premio al Investigador del Año (Area Salud) por la Universidad de Costa Rica.

2007-2009: Miembro del comité que redactó las *Guidelines for the Production, Control and Regulation of Snake Antivenom Immunoglobulins*, de la Organización Mundial de la Salud.

2012: Reconocimiento del CONICIT (Costa Rica) por aportes a la investigación científica.

2014-2015: Coordinador del componente de antivenenos del proyecto regional OEA-FEMCIDI 'Strengthening National Metrology Institutes in the Hemisphere, an essential element in the development of National Quality Infrastructure.

2015: Redi Award otorgado por la International Society on Toxinology por contribuciones en el área de la Toxinología.

Participación en Consejos Editoriales de revistas científicas:

- Toxicon, official journal of the International Society on Toxinology.
- PLoS Neglected Tropical Diseases
- PLoS ONE
- Indian Journal of Experimental Biology

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LISTA DE PUBLICACIONES

I. Artículos en Revistas de Investigación Científica.

1. **Gutiérrez, J.M.** & Bolaños, R. (1979) Cariotipos de las principales serpientes coral (Elapidae: *Micrurus*) de Costa Rica. *Revista de Biología Tropical* **27**: 57-73.
2. **Gutiérrez, J.M.**, Taylor, R. & Bolaños, R. (1979) Cariotipos de diez especies de serpientes costarricenses de la familia Viperidae. *Revista de Biología Tropical* **27**: 309-319.
3. **Gutiérrez, J.M.** & Bolaños, R. (1980) Karyotype of the yellow-bellied sea snake, *Pelamis platurus*. *Journal of Herpetology* **14**: 161-165.
4. **Gutiérrez, J.M.** & Bolaños, R. (1980) El problema de los efectos hemorrágico y mionecrótico por mordeduras de serpientes en el Continente Americano. *Boletín de la Oficina Sanitaria Panamericana* **89**: 149-158.
5. **Gutiérrez, J.M.** & Chaves, F. (1980) Efectos proteolítico, hemorrágico y mionecrótico de los venenos de serpientes costarricenses de los géneros *Bothrops*, *Crotalus* y *Lachesis*. *Toxicon* **18**: 315-321.
6. **Gutiérrez, J.M.**, Arroyo, O. & Bolaños, R. (1980) Mionecrosis, hemorragia y edema inducidos por el veneno de *Bothrops asper* en ratón blanco. *Toxicon* **18**: 603-610.
7. **Gutiérrez, J.M.**, Chaves, F., Rojas, E. & Bolaños, R. (1980) Efectos locales inducidos por el veneno de la serpiente coral *Micrurus nigrocinctus* en ratón blanco. *Toxicon* **18**: 633-639.
8. **Gutiérrez, J.M.**, Chaves, F. & Bolaños, R. (1980) Estudio comparativo de venenos de ejemplares recién nacidos y adultos de *Bothrops asper*. *Revista de Biología Tropical* **28**: 341-351.

9. **Gutiérrez, J.M.** (1980) Venenos de serpientes de América: Sus efectos en el organismo. *Ciencias Veterinarias* **2**: 277-289.
10. Espinoza, A.M., León, P., Macaya, G., Fuentes, A.L. & **Gutiérrez, J.M.** (1980) Estructura y función de los cromosomas plumulados. *Revista de Biología Tropical* **28**: 209-226.
11. **Gutiérrez, J.M.** & Bolaños, R. (1981) Polimorfismo cromosómico intraespecífico en la serpiente coral *Micrurus nigrocinctus* (Ophidia: Elapidae). *Revista de Biología Tropical* **29**: 115-122.
12. Arroyo, O. & **Gutiérrez, J.M.** (1981) Estudio ultraestructural de la mionecrosis inducida en ratón por el veneno de terciopelo (*Bothrops asper*) de Costa Rica. *Toxicon* **19**: 733-782.
13. **Gutiérrez, J.M.**, Chaves, F., Bolaños, R., Cerdas, L., Rojas, E., Arroyo, O. & Portilla, E. (1981). Neutralización de los efectos locales del veneno de *Bothrops asper* por un antiveneno polivalente. *Toxicon* **19**: 493-500.
14. Lomonte, B., Cerdas, L., Gené, J.A. & **Gutiérrez, J.M.** (1982) Neutralization of local effects of the terciopelo (*Bothrops asper*) venom by blood serum of the colubrid snake *Clelia clelia*. *Toxicon* **20**: 571-579.
15. Ownby, C.L., **Gutiérrez, J.M.**, Colberg & Odell, G.V. (1982) Quantification of myonecrosis induced by myotoxin a from prairie rattlesnake (*Crotalus viridis viridis*) venom. *Toxicon* **20**: 877-885.
16. **Gutiérrez, J.M.**, Cerdas, L., Arroyo, O., Rojas, E., Lomonte, B. & Gené, J.A. (1982) Patogénesis y neutralización de los efectos locales inducidos por veneno de la serpiente "terciopelo" (*Bothrops asper*). *Acta Médica Costarricense* **25**: 255-262.
17. Lomonte, B., Gené, J.A., **Gutiérrez, J.M.** & Cerdas, L. (1983) Estudio comparativo de los venenos de serpiente cascabel (*Crotalus durissus durissus*) de ejemplares adultos y recién nacidos. *Toxicon* **21**: 379-384.
18. **Gutiérrez, J.M.**, Lomonte, B., Portilla, E., Cerdas, L. & Rojas, E. (1983) Local effects induced by coral snake venoms: Evidence of myonecrosis after experimental inoculation of venoms from five species. *Toxicon* **21**: 777-783.
19. Lomonte, B. & **Gutiérrez, J.M.** (1983) La actividad proteolítica de los venenos de serpientes de Costa Rica sobre la caseína. *Revista de Biología Tropical* **31**: 37-40.
20. **Gutiérrez, J.M.**, Ownby, C.L. & Odell, G.V. (1984) Isolation of a myotoxin from *Bothrops asper* venom: Partial characterization and action on skeletal muscle. *Toxicon* **22**: 115-128.

21. **Gutiérrez, J.M.**, Ownby, C.L. & Odell, G.V. (1984) Pathogenesis of myonecrosis induced by crude venom and a myotoxin of *Bothrops asper*. *Experimental and Molecular Pathology* **40**: 367-379.
22. **Gutiérrez, J.M.**, Ownby, C.L. & Odell, G.V. (1984) Skeletal muscle regeneration after myonecrosis induced by crude venom and a myotoxin from the snake *Bothrops asper* (Fer-de-Lance). *Toxicon* **22**: 719-731.
23. Herrero, M.V. & **Gutiérrez, J.M.** (1984) Efecto mionecrótico de *Aphonopelma seemani* (Araneae: Theraphosidae) de Costa Rica en ratón blanco. *Revista de Biología Tropical* **32**: 173-175.
24. **Gutiérrez, J.M.** & Cerdas, L. (1984) Mecanismo de acción de miotoxinas aisladas de venenos de serpientes. *Revista de Biología Tropical* **32**: 213-222.
25. **Gutiérrez, J.M.**, Solórzano, A. & Cerdas, L. (1984) Estudios cariológicos de cinco especies de serpientes costarricenses de la familia Colubridae. *Revista de Biología Tropical* **32**: 263-267.
26. Gené, J.A., Lomonte, B., **Gutiérrez, J.M.** & Cerdas, L. (1985) Cambios en el patrón electroforético del veneno de la serpiente cascabel muda (*Lachesis muta stenophrys*) almacenado bajo diferentes condiciones. *Revista de Biología Tropical* **33**: 63-65.
27. Lomonte, B., **Gutiérrez, J.M.** & Mata, E. (1985) Isolation from a polyvalent antivenom of antibodies to a myotoxin in *Bothrops asper* snake venom. *Toxicon* **23**: 807-813.
28. **Gutiérrez, J.M.**, Gené, J.A., Rojas, G. & Cerdas, L. (1985) Neutralization of proteolytic and hemorrhagic activities of Costa Rican snake venoms by a polyvalent antivenom. *Toxicon* **23**: 887-893.
29. Gené, J.A., Gómez, M., **Gutiérrez, J.M.** & Cerdas, L. (1985) Neutralization of hyaluronidase and indirect hemolytic activities of Costa Rican snake venoms by a polyvalent antivenom. *Toxicon* **23**: 1015-1018.
30. **Gutiérrez, J.M.**, Chaves, F., Mata, E. & Cerdas, L. (1986) Skeletal muscle regeneration after myonecrosis induced by *Bothrops asper* (terciopelo) venom. *Toxicon* **24**: 223-231.
31. **Gutiérrez, J.M.**, Lomonte, B., Chaves, F., Moreno, E. & Cerdas, L. (1986) Pharmacological activities of a toxic phospholipase A isolated from the venom of the snake *Bothrops asper*. *Comparative Biochemistry and Physiology* **84C**: 159-164.
32. **Gutiérrez, J.M.**, Arroyo, O., Chaves, F., Lomonte, B. & Cerdas, L. (1986) Pathogenesis of myonecrosis induced by coral snake (*Micrurus nigrocinctus*) venom in mice. *British Journal of Experimental Pathology* **67**: 1-12.

33. **Gutiérrez, J.M.**, Lomonte, B. & Cerdas, L. (1986) Isolation and partial characterization of a myotoxin from the venom of the snake *Bothrops nummifer*. *Toxicon* **24**: 885-894.
34. **Gutiérrez, J.M.**, Rojas, G., Lomonte, B., Gené, J.A. & Cerdas, L. (1986) Comparative study of the edema-forming activity of Costa Rican snake venoms and its neutralization by a polyvalent antivenom. *Comparative Biochemistry and Physiology* **85C**: 171-175.
35. **Gutiérrez, J.M.**, Chaves, F. & Cerdas, L. (1986) Inflammatory infiltrate in skeletal muscle injected with *Bothrops asper* venom. *Revista de Biología Tropical* **34**: 209-219.
36. **Gutiérrez, J. M.** (1986) Algunas reflexiones sobre Clodomiro Picado Twight y su contribución al desarrollo de las ciencias médicas y naturales de Costa Rica. *Revista de Filosofía de la Universidad de Costa Rica* **59**: 105-110.
37. Rojas, G., **Gutiérrez, J.M.**, Gené, J.A., Gómez, M. & Cerdas, L. (1987) Neutralización de las actividades tóxicas y enzimáticas de cuatro venenos de serpientes de Guatemala y Honduras por el antiveneno polivalente producido en Costa Rica. *Revista de Biología Tropical* **35**: 59-67.
38. Lomonte, B., **Gutiérrez, J.M.**, Moreno, E. & Cerdas, L. (1987) Antibody neutralization of a myotoxin from the venom of *Bothrops asper* (terciopelo). *Toxicon* **25**: 443-449.
39. Lomonte, B., Moreno, E. & **Gutiérrez, J.M.** (1987) Detection of proteins antigenically-related to *Bothrops asper* myotoxin in crotaline snake venoms. *Toxicon* **25**: 947-955.
40. Brenes, F., **Gutiérrez, J.M.** & Lomonte, B. (1987) Immunohistochemical demonstration of the binding of *Bothrops asper* myotoxin to skeletal muscle sarcolemma. *Toxicon* **25**: 574-577.
41. **Gutiérrez, J.M.**, Rojas, G. & Cerdas, L. (1987) Ability of a polyvalent antivenom to neutralize the venom of *Lachesis muta melanocephala*, a new Costa Rican subspecies of the bushmaster. *Toxicon* **25**: 713-720.
42. Arroyo, O., Rosso, J.P., Vargas, O., **Gutiérrez, J.M.** & Cerdas, L. (1987) Skeletal muscle necrosis induced by a phospholipase A isolated from the venom of the coral snake *Micrurus nigrocinctus*. *Comparative Biochemistry and Physiology* **87B**: 949-952.
43. **Gutiérrez, J.M.** (1987) El legado de Clodomiro Picado: Hacia un estilo integral-humanista en la investigación científica y tecnológica. *Tecnología en Marcha* **9**: 3-8.

44. **Gutiérrez, J.M.** (1987) Regeneración muscular posterior a mionecrosis inducida por veneno de la serpiente *Bothrops asper* (terciopelo): nuevas posibilidades para enfrentar un viejo problema. *Revista Médica del Hospital Nacional de Niños* **22**: 169-176.
45. Solórzano, A., **Gutiérrez, J.M.** & Cerdas, L. (1987) *Bothrops ophryomegas* Bocourt (Serpentes: Viperidae) en Costa Rica: Distribución, lepidosis, variación sexual y cariotipo. *Revista de Biología Tropical* **36**: 187-190.
46. Moreno, E. & **Gutiérrez, J.M.** (1987) Body distribution of *Bothrops asper* (terciopelo) myotoxin and its relationship to pathology. *Toxicon* **26**: 403-409.
47. **Gutiérrez, J.M.**, Rojas, G., Lomonte, B., Gené, J.A. & Cerdas, L. (1987) Effects of a myotoxic phospholipase A₂ isolated from *Bothrops asper* snake venom on rabbit sarcoplasmic reticulum. *Toxicon* **25**: 1244-1248.
48. **Gutiérrez, J.M.**, Avila, C., Rojas, E. & Cerdas, L. (1988) An alternative *in vitro* method for testing the potency of the polyvalent antivenom produced in Costa Rica. *Toxicon* **26**: 411-413.
49. Moreno, E., Alape, A., Sánchez, M. & **Gutiérrez, J.M.** (1988) A new method for the detection of phospholipase A₂ variants: Identification of isozymes in the venoms of newborn and adult *Bothrops asper* (terciopelo). *Toxicon* **26**: 317-363.
50. **Gutiérrez, J.M.**, Solórzano, A., Vannini, J. & Cerdas, L. (1988) Karyotypes of five species of coral snake (*Micrurus*). *Journal of Herpetology* **22**: 109-112.
51. **Gutiérrez, J.M.**, Chaves, F., Rojas, E., Elizondo, J., Avila, C. & Cerdas, L. (1988) Production of monovalent anti-*Bothrops asper* antivenom: development of immune response in horses and neutralizing ability. *Revista de Biología Tropical* **36**: 511-517.
52. **Gutiérrez, J.M.**, Lomonte, B., Rojas, G., Gené, J.A., Chaves, F., Estrada, R., Alvarado, J., Rojas, E. & Robles, A. (1988) El suero antiofídico polivalente producido en Costa Rica. Estabilidad y capacidad neutralizante. *Revista Costarricense de Ciencias Médicas* **9**: 155-169.
53. Alvarado, J.A. & **Gutiérrez, J.M.** (1988) Anticoagulant effect of a myotoxic phospholipase A₂ isolated from the venom of the snake *Bothrops asper* (terciopelo). *Revista de Biología Tropical* **36**: 563-565.
54. Robles, A. & **Gutiérrez, J.M.** (1989) Descripción de un programa para la determinación de la capacidad de los antivenenos para neutralizar la actividad hemolítica de los venenos. *Revista Médica del Hospital Nacional de Niños* **24**: 11-14.
55. **Gutiérrez, J.M.**, Chaves, F., Gené, J.A., Lomonte, B., Camacho, Z. & Schosinsky, K. (1989) Myonecrosis induced by a basic myotoxin isolated from the venom of the snake *Bothrops nummifer* (Jumping Viper) from Costa Rica. *Toxicon* **27**: 735-746.

56. Gené, J.A., Roy, A., Rojas, G., **Gutiérrez, J.M.** & Cerdas, L. (1989) Comparative study on coagulant, defibrinating, fibrinolytic and fibrinogenolytic activities of Costa Rican crotaline snake venoms and their neutralization by a polyvalent antivenom. *Toxicon* **27**: 841-848.
57. Lomonte, B. & **Gutiérrez, J.M.** (1989) A new muscle damaging toxin, myotoxin II, from the venom of the snake *Bothrops asper* (terciopelo). *Toxicon* **27**: 725-733.
58. Chaves, F., **Gutiérrez, J.M.**, Lomonte, B. & Cerdas, L. (1989) Histopathological and biochemical alterations induced by intramuscular injection of *Bothrops asper* (terciopelo) venom in mice. *Toxicon* **27**: 1085-1093.
59. **Gutiérrez, J.M.** & Lomonte, B. (1989) Local tissue damage induced by *Bothrops* snake venoms. A review. *Memorias do Instituto Butantan* **51**: 211-223.
60. Solórzano, A., **Gutiérrez, J.M.** & Cerdas, L. (1989) Notes on the natural history and karyotype of the colubrid snake, *Hydromorphus concolor* Peters, from Costa Rica. *Journal of Herpetology* **23**: 314-315.
61. Estrada, R., **Gutiérrez, J.M.**, Alvarado, J., Robles, A., Avila, C. & González, N. (1989) Desarrollo de la respuesta inmune en caballos inoculados con venenos para la producción del suero antiofídico polivalente en Costa Rica. *Revista de Biología Tropical* **37**: 187-191.
62. Lomonte, B., Rojas, G., **Gutiérrez, J.M.** & Ramírez, G. (1990) Isolation of a galactose-binding lectin from the venom of the snake *Bothrops godmani* (Godmann's pit viper). *Toxicon* **28**: 75-81.
63. Rojas, G., Espinoza, M., Lomonte, B. & **Gutiérrez, J.M.** (1990) Effect of storage temperature on the stability of the liquid polyvalent antivenom produced in Costa Rica. *Toxicon* **28**: 101-105
64. **Gutiérrez, J.M.**, Arce, V., Brenes, F. & Chaves, F. (1990) Changes in myofibrillar components after skeletal muscle necrosis induced by a myotoxin isolated from the venom of the snake *Bothrops asper*. *Experimental and Molecular Pathology* **52**: 25-36.
65. **Gutiérrez, J.M.**, Avila, C. Camacho, Z. & Lomonte, B. (1990) Ontogenetic changes in the venom of the snake *Lachesis muta stenophrys* (bushmaster) from Costa Rica. *Toxicon* **28**: 419-426.
66. Lomonte, B., Furtado, M.F., Rovira, M.E., Carmona, E., Rojas, G., Aymerich, R. & **Gutiérrez, J.M.** (1990) South American snake venom proteins antigenically related to *Bothrops asper* myotoxins. *Brazilian Journal of Medical and Biological Research* **23**: 427-435.

67. Lomonte, B., **Gutiérrez, J.M.**, Carmona, E. & Rovira, M.E. (1990) Equine antibodies to *Bothrops asper* myotoxin II: isolation from polyvalent antivenom and neutralizing ability. *Toxicon* **28**: 379-384.
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70. **Gutiérrez, J.M.**, Rojas, G., Lomonte, B., Gené, J.A., Chaves, F., Alvarado, A. & Rojas, E. (1990) Standardization of assays for testing the neutralizing ability of antivenoms. *Toxicon* **28**: 1127-1129.
71. Lomonte, B., **Gutiérrez, J.M.**, Furtado, M.F., Otero, R., Rosso, J.P., Vargas, O., Carmona, E. & Rovira, M.E. (1990) Isolation of basic myotoxins from *Bothrops moojeni* and *Bothrops atrox* snake venoms. *Toxicon* **28**: 1137-1146.
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73. Arce, V., Brenes, F. & **Gutiérrez, J.M.** (1991) Degenerative and regenerative changes in murine skeletal muscle after injection of venom from the snake *Bothrops asper*: a histochemical and immunocytochemical study. *International Journal of Experimental Pathology* **72**: 211-226.
74. **Gutiérrez, J.M.**, Rojas, G., Pérez, A., Arguello, I. & Lomonte, B. (1991) Neutralization of coral snake (*Micrurus nigrocinctus*) venom by a monovalent antivenom. *Brazilian Journal of Medical and Biological Research* **24**: 701-710.
75. Lomonte, B., **Gutiérrez, J.M.**, Rojas, G. & Calderón, L. (1991) Quantitation by enzyme-immunoassay of antibodies against *Bothrops* myotoxins in four commercially-available antivenoms. *Toxicon* **29**: 695-702.
76. **Gutiérrez, J.M.**, Dos Santos, M.C., Furtado, M.F. & Rojas, G. (1991) Biochemical and pharmacological similarities between the venoms of newborn *Crotalus durissus durissus* and adult *Crotalus durissus terrificus* rattlesnakes. *Toxicon* **29**: 1273-1277.
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79. Díaz, C., **Gutiérrez, J.M.**, Lomonte, B. & Gené, J.A. (1991) The effect of myotoxins isolated from *Bothrops* snake venoms on multilamellar liposomes: relationship to phospholipase A₂, anticoagulant and myotoxic activities. *Biochimica et Biophysica Acta* **1070**: 455-460.
80. **Gutiérrez, J.M.**, Núñez, J., Díaz, C., Cintra, A.C.O., Homsí-Brandeburgo, M.I. & Giglio, J.R. (1991) Skeletal muscle degeneration and regeneration after injection of bothropstoxin-II, a phospholipase A₂ isolated from the venom of the snake *Bothrops jararacussu*. *Experimental and Molecular Pathology* **55**: 217-229.
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84. Dos Santos, M.C., Goncalves, L.R.C., Fortes-Dias, C.L., Cury, Y., **Gutiérrez, J.M.** & Furtado, M.F.D. (1992) A eficacia do antiveneno botrópico-crotálico na neutralização das principais atividades do veneno de *Bothrops jararacussu*. *Revista do Instituto de Medicina Tropical de Sao Paulo* **34**: 77-83.
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II. Capítulos en Libros.

1. **Gutiérrez, J.M.** (1986) Myonecrosis induced by *Bothrops asper* venom: Pathogenesis and treatment. En: *Proceedings of the Second American Symposium on Animal, Plant & Microbial Toxins* (Bieber, A., Ed.), pp 27-39. Tempe, International Society on Toxinology.

2. Moya, J.E. & **Gutiérrez, J.M.** (1987) Mordedura de Serpiente. En: *Emergencias Médicas*, Vol. 1. (Quesada, O., Ed.), pp 253-273. Pfizer.
3. Bolaños, R. & **Gutiérrez, J.M.** (1988) El doctor Clodomiro Picado y nuestras serpientes venenosas. En: *Obras Completas de Clodomiro Picado Twilight*, Vol. VII, pp. 128-137. Cartago, Editorial Tecnológica de Costa Rica.
4. **Gutiérrez, J.M.** (1989) Opciones de desarrollo científico en Costa Rica y la responsabilidad del investigador. En: *Historia de la Ciencia y la Tecnología*, pp. 239-253 (Ruiz, A. *et al.*, Eds.). Cartago, Editorial Tecnológica de Costa Rica.
5. **Gutiérrez, J.M.** & Monge-Nájera, J. (1989) Clodomiro Picado y sus años de formación científica. En: *Historia de la Ciencia y la Tecnología*, pp. 403-421 (Ruiz, A. *et al.*, Eds.). Cartago, Editorial Tecnológica de Costa Rica.
6. **Gutiérrez, J.M.** & Loría, R. (1991) Ofidismo. En: *Pediatría*, pp 829-832 (Meneghello, J., Fanta, E., Paris, E. & Rosselot, J., Eds.). Cuarta Edición. Santiago, Publicaciones Técnicas Mediterráneo.
7. **Gutiérrez, J.M.** (1991) Mechanism of action of myotoxins isolated from Crotaline snake venoms. En: *Proceedings of the First Brazilian Congress on Proteins* (Oliveira, B. & Sgarbieri, V., Eds.), pp 336-351. Campinas, Editora da UNICAMP.
8. **Gutiérrez, J.M.**, Segura, M. & Aymerich, R. (1991) Historia del Instituto Clodomiro Picado. En: *Ciencia y Tecnología en la Construcción del Futuro* (Ruiz, A., Ed.), p.203. Asociación Costarricense de Historia y Filosofía, San José.
9. **Gutiérrez, J.M.** (1995) Clinical toxicology of snakebite in Central America. En: *Clinical Toxicology of Animal Venoms and Poisons*, pp 645-665 (Meier, J. & White, J., Eds.). Florida, CRC Press.
10. **Gutiérrez, J.M.**, Rojas, G., Bogarín, G. & Lomonte, B. (1996) Evaluation of the neutralizing ability of antivenoms for the treatment of snake bite envenoming in Central America. En: *Envenomings and Their Treatment*, pp. 223-231 (Bon, C. & Goyffon, M., Eds). Lyon, Edit. Fondation Marcel Mérieux.
11. **Gutiérrez, J.M.** & Ovadia, M. (1996) *Bothrops asper* hemorrhagic metalloproteinases BaH1 and BaP1. En: *Handbook of Proteolytic Enzymes* (Barret, A.J., Rawlings, N.D. & Woessner, J.F., Eds.), pp1295-1297. Academic Press, San Diego.
12. **Gutiérrez, J.M.** & Lomonte, B. (1997) Phospholipase A₂ myotoxins from *Bothrops* snake venoms. En: *Venom phospholipase A₂ enzymes: structure, function, and mechanism* (Kini, R.M., Ed.), pp. 321-352. John Wiley & Sons, England.

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14. **Gutiérrez, J.M.** (1997) Envenenamiento ofídico. En: *Pediatría* (Meneghello, J., Fanta, E., París, E., Puga, T.F., Eds.), pp 1115-1118. Editorial Médica Panamericana, Buenos Aires.
15. **Gutiérrez, J.M.** & Lomonte, B. (2003) Efectos locales en el envenenamiento ofídico en América Latina. En: *Animais Peconhentos no Brasil. Biologia, Clínica e Terapêutica dos Acidentes* (Cardoso, J.L.C., Franca, F.O.S., Wen, F.H., Málaque, C.M.S., Daddad, V., Eds.). Sarvier, Sao Paulo, pp 310-323.
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17. **Gutiérrez, J.M.**, Rucavado, A. & Escalante, T. (2010) Snake venom metalloproteinases. Biological roles and participation in the pathophysiology of envenomation. En: *Handbook of Venoms and Toxins of Reptiles* (Mackessy, S.P. Ed.). CRC Press, Florida, pp. 115-138.
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21. **Gutiérrez, J.M.** (2011) La importancia de la generación endógena de conocimiento científico para el sistema ciencia-tecnología-innovación. En: *Conocimiento, Innovación y Desarrollo* (Herrera, R., Gutiérrez, J.M., Eds.).
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29. **Gutiérrez, J.M.**, Escalante, T. & Rucavado, A. (2016) Metaloproteinasas dependientes de zinc: Protagonistas centrales en la fisiopatología de envenenamientos por serpientes de la familia Viperidae. En: *Temas Seleccionados de Toxinas con Implicaciones Biomédicas y Métodos para su Estudio*. BIOTOX-CYTED. E book, pp. 26-35.

III. Publicaciones de Carácter Divulgativo y Educativo.

1. **Gutiérrez, J.M.**, Rojas, G., Lomonte, B., Gené, J.A. & Chaves, F. (1990) La evaluación de la capacidad neutralizante de los antivenenos en América. Instituto Clodomiro Picado.
2. **Gutiérrez, J.M.** (2010) Los orígenes del Instituto Clodomiro Picado. San José, Instituto Clodomiro Picado.

IV. Textos de Docencia Universitaria.

1. **Gutiérrez, J.M.,** Rojas, G. & Aymerich, R. (1999) *El envenenamiento ofídico en Centroamérica: fisiopatología y tratamiento.* Publicaciones del Instituto Clodomiro Picado.

V. Presentaciones en congresos, simposios y otros eventos científicos internacionales

2015:

- (1) Conferencista en el Simposio “El envenenamiento por mordedura de serpiente: Epidemiología, Fisiopatología y Tratamiento”, celebrado en el Colegio de Médicos y Cirujanos de Costa Rica el 27 de febrero del 2015.
- (2) Conferencista en el X Congreso FELAIBE (Bioética), celebrado en San José, Costa Rica, el 25 de marzo del 2015.
- (3) Conferencista en el “III Congreso Internacional LICIFO”, Facultad de Odontología, Universidad de Costa Rica, el 21 de mayo del 2015.
- (4) Coordinador y conferencista del taller internacional “Control de Calidad de Antivenenos”, celebrado en Lima, Perú, del 27 al 29 de mayo, 2015.
- (5) Conferencista en el Congreso Nacional de Pediatría, San José, Costa Rica, del 3 al 6 de junio del 2015.
- (6) Conferencista en el simposio “Gestión y Sostenibilidad de una Cultura Institucional orientada a la Excelencia en la Educación Superior”, Universidad de Costa Rica, 15 de julio del 2015.
- (7) Conferencista en el “World Congress of the International Society on Toxinology (IST)”, celebrado en Oxford, Inglaterra, del 24 al 30 de setiembre del 2015.

2014:

- (1) Conferencista en el taller “Perspectivas de investigación del ofidismo en Ecuador”, celebrado en Quito el 23 y 24 enero del 2014.
- (2) Coordinador y conferencista en el “Taller de antivenenos del proyecto regional OEA-FEMCIDI de antivenenos”, celebrado en el Instituto Butantan, Brasil, del 24 al 26 de febrero del 2014.
- (3) Conferencista en el 57° Congreso Médico Nacional de Honduras, celebrado en La Ceiba, Honduras, del 8 al 11 de julio del 2014.
- (4) Conferencista en el V Congreso Brasileiro de Toxicología Clínica, celebrado en Salvador, Bahia, Brasil, del 10 al 12 de setiembre del 2014.

2013:

- (1) Presentación de seminario sobre mecanismo de hemorragia por metaloproteinasas de venenos, Universidad de Antioquia, Medellín, Colombia (mayo del 2013).
- (2) Conferencista en el Primer Encuentro Internacional Vital para o Brasil, Niteroi, Rio de Janeiro, Brasil (setiembre del 2013).

- (3) Conferencista en el XI Congress of the Pan-American Section of the International Society on Toxinology, Guarujá, Sao Paulo, Brasil (Noviembre del 2013).

2012:

- (1) Conferencista en el XXIX Congreso Brasileiro de Zoología, Salvador, Bahia, Brasil (marzo del 2012)
- (2) Conferencista en el World Congress of the International Society on Toxinology (IST), Hawaii, USA (Julio del 2012)
- (3) Conferencista en el VI Biennial NeTropica Meeting, Copán, Honduras (julio del 2012)
- (4) Conferencista en el II Congreso Centroamericano de Toxicología, Managua, Nicaragua (agosto del 2012).
- (5) Conferencista en el Taller Toxinas de Interés para la Biomedicina (proyecto CYTED de Biotoxinas), Instituto Clodomiro Picado (agosto del 2012).
- (6) Conferencista en el Congreso Internacional de Medicina Tropical, Rio de Janeiro, Brasil (setiembre del 2012).
- (7) Conferencista en la Reunión Científica Anual del Instituto Butantan, Sao Paulo, Brasil (diciembre del 2012).

2011:

- (1) Conferencista en el Taller “Priorities Dialogue Workshop”, organizado por Euricanet, Santo Domingo, República Dominicana (marzo del 2011).
- (2) Presentación de un seminario sobre proteómica de venenos de serpiente en la Facultad de Biología, Universidad de La Habana, Cuba (abril del 2011).
- (3) Conferencista en el Segundo Congreso Latinoamericano de Genética Humana, San José, Costa Rica (mayo del 2011).
- (4) Conferencista invitado en el Congreso de la Sección Europea de la International Society on Toxinology, celebrado en Valencia, España (setiembre 2011).
- (5) Presentación de seminario sobre mecanismo de acción de metaloproteinasas hemorrágicas de venenos, en la Universidad de Padova, Italia (setiembre 2011).

2010:

- (1) Conferencista en el Congreso sobre Bioética, celebrado en la Universidad de Costa Rica (agosto 2010).
- (2) Presentación de un seminario sobre neutralización de venenos de serpiente en la Universidad de Freiburg, Alemania (diciembre del 2010).

2009:

- (1) Conferencista en el World Congress of the International Society on Toxinology (IST), celebrado en Recife, Brasil (marzo 2009).
- (2) Conferencista en el Curso Internacional sobre Ensayos Clínicos de Antivenenos, celebrado en el Instituto Nacional de Salud, Lima, Perú (abril del 2009).

- (3) Conferencista en el simposio Debates Científicos Vital Brazil 90 Años, celebrado en el Instituto Vital Brazil, Niteroi, Rio de Janeiro, Brasil (junio del 2009).
- (4) Conferencista en el Simposio Internacional de Toxinología, celebrado en ciudad de Panamá (setiembre del 2009).

2008:

- (1) Conferencista en el Workshop on Antivenoms, organizado por la OMS en Addis Ababa, Etiopía (julio 2008).
- (2) Participación como experto en la reunión del Expert Committee on Biological Standardization, de la OMS, en Ginebra, Suiza (Octubre 2008)
- (3) Conferencista en el simposio sobre Global Issues in Clinical Toxinology, celebrado en Melbourne, Australia; la participación fue a través de teleconferencia desde Costa Rica (noviembre 2008).
- (4) Presentación de seminario en el Instituto de Biomedicina de Valencia, España (enero 2008).

2007:

- (1) Conferencista en el simposio 'Venom Week 2007', organizado en Tucson por la University of Arizona (setiembre 2007).
- (2) Participación como experto en un grupo de trabajo de la Organización Mundial de la Salud (OMS) para elaborar las Guías de la OMS para la Producción y Control de Antivenenos (julio 2007).
- (3) Conferencista en el Taller sobre Control de Calidad de Antivenenos en Iberoamérica, organizado por el programa CYTED en el Instituto Clodomiro Picado (julio 2007).
- (4) Conferencista en el Simposio Internacional sobre Ofidismo, organizado por la Universidad de Panamá (mayo del 2007).
- (5) Conferencista en el X Congreso de Medicina de la Universidad José Matías Delgado, San Salvador, El Salvador (mayo del 2007).
- (6) Participante en el Simposio de la organización NeTropica, La Ceiba, Honduras (Febrero del 2007).
- (7) Conferencista en el evento 'Rabies and Envenomings: A Neglected Public Health Issue', organizado por la OMS en Ginebra (enero del 2007).

2006:

- (1) Conferencista en el curso sobre Venenos y Antivenenos, organizado por la Fundación Ezequiel Dias, Belo Horizonte, Brasil (setiembre del 2006).
- (2) Conferencia sobre nuevas posibilidades para el tratamiento del envenenamiento por mordedura de serpiente, Instituto de Farmacología Molecular y Celular, Sophia Antipolis, Francia (julio del 2006).
- (3) Conferencista en el Simposio Mundial de la Sociedad Internacional de Toxicología, celebrado en Glasgow, Escocia (julio del 2006).
- (4) Conferencista en el Taller sobre Producción de Antivenenos en Iberoamérica, celebrado en el Instituto Butantan, Brasil (junio del 2006).

2005:

- (1) Conferencista en el WW Congreso Científico Internacional de la Federación Latinoamericana de Sociedades de Estudiantes de Medicina, celebrado en Panamá (noviembre del 2005).
- (2) Conferencista en el WIV Congreso Brasileiro de Toxicología, celebrado en Recife, Brasil (Octubre del 2005).
- (3) Conferencista en el simposio internacional 'Avances en Herpetología Neotropical', celebrado en la Universidad de Costa Rica (noviembre del 2005).
- (4) Conferencista en el simposio internacional 'El Envenenamiento Ofídico', celebrado en la Universidad de Costa Rica (noviembre del 2005).
- (5) Conferencista en el Primer Curso Internacional 'Toxinas y Envenenamientos por Animales Ponzosñosos', celebrado en Lima, Perú (julio del 2005).
- (6) Conferencista en la VII Reunión de Expertos en Emponzoñamientos por Animales Venenosos', celebrado en México (marzo del 2005).
- (7) Participación en el III Congreso Bienal de la Red NeTropica, celebrado en León, Nicaragua (febrero del 2005).

2004:

- (1) Conferencista en el Simposio de la Sección Panamericana de la Sociedad Internacional de Toxicología, celebrado en Rio de Janeiro, Brasil (setiembre del 2004).
- (2) Seminario sobre 'Mecanismos de inducción de hemorragia por metaloproteinasas de venenos' en la Liverpool School of Tropical Medicine, Liverpool, Inglaterra (abril del 2004).

2003:

- (1) Conferencista en la Jornada de Ofidismo, organizada por la Universidad de Panamá y celebrada en Santiago de Veraguas (octubre del 2003).
- (2) Conferencista en el Segundo Simposio Internacional de la Red Netropica, celebrado en Panamá (enero del 2003).

2002:

- (1) Conferencista en el VII Simposio de la Sociedad Brasileira de Toxicología, celebrado en Goias, Brasil (setiembre del 2002).
- (2) Conferencia sobre miotoxinas de venenos de serpientes, dictada en la Universidad Estadual Paulista, Sao José de Rio Preto, Brasil (setiembre del 2002).

2001:

- (1) Conferencista en el V Congreso de la Sociedad Mesoamericana para la Biología y la Conservación, celebrado en San Salvador, El Salvador (octubre del 2001).

- (2) Conferencista en el Simposio de la Sección Panamericana de la Sociedad Internacional de toxicología, celebrado en Virginia USA (agosto del 2001).
- (3) Conferencista en el Simposio Nacional de Toxicología, celebrado en Panamá (abril del 2001).
- (4) Conferencista en la 5ª. Reunión de Expertos en Envenenamiento por Animales Ponzñosos, celebrado en Puebla, México (marzo del 2001).
- (5) Conferencista en el Primer Simposio Internacional sobre Enfermedades Tropicales, celebrado en Guatemala (marzo del 2001).
- (6) Conferencista en el Workshop on Antivenoms, organizado por la Organización Mundial de la Salud en Londres, Inglaterra (enero del 2001).

2000:

- (1) Conferencista en el XV Congreso Internacional de Medicina Tropical y Malaria, celebrado en Cartagena, Colombia (agosto del 2000).
- (2) Conferencista en el I Taller Interamericano sobre Toxinas Naturales, celebrado en Caracas, Venezuela (julio del 2000).
- (3) Conferencista en el simposio internacional 'El Envenenamiento Ofídico: un Problema de Salud Pública en América Latina', celebrado en San José, Costa Rica (abril del 2000).

1999:

- (1) Conferencista en el Curso Internacional sobre Toxinas de Origen Animal, celebrado en la Universidad de San Marcos, Lima, Perú (noviembre de 1999).
- (2) Conferencia sobre envenenamiento ofídico en el Hospital San Juan de Dios, Guatemala (abril de 1999).

1998:

- (1) Conferencista en el Simposio de la Sociedad Brasileira de Toxicología, celebrado en Rio de Janeiro, brasil (setiembre de 1998).
- (2) Conferencista en el simposio '*Lachesis muta*: un desafío biológico y toxinológico', celebrado en Niteroi, Brasil (setiembre de 1998).
- (3) Conferencista en el Simposio 'Impacto de la Ciencia Endógena en la Sociedad Latinoamericana', celebrado en Bariloche, Argentina (agosto de 1998).
- (4) Conferencista en el Primer Simposio Colombiano de Toxicología, celebrado en Medellín, Colombia (marzo del 1998).

1997:

- (1) Conferencista en el 12 Congreso Mundial de la Sociedad Internacional de Toxinología, celebrado en Cuernavaca, México (setiembre de 1997).
- (2) Profesor conferencista en curso sobre Venenos Botrópicos y Producción de Sueros Antiofídicos, celebrado en la Universidad Federal de Pernambuco, Recife, Brasil (agosto de 1998).

- (3) Conferencista en el Simposio 'Science for Sustainable Development in Latin America and the Caribbean', celebrado en Rio de Janeiro, Brasil (setiembre de 1997).

1996:

- (1) Conferencista en el Mini-Simposio 'Miotoxinas de Venenos de Serpientes', celebrado en la ciudad de Sao Carlos, Sao Paulo, Brasil (setiembre del 1996).
- (2) Conferencista en el Simposio de la Sociedad Brasileira de Toxicología, celebrado en Recife, Brasil (setiembre del 1996).
- (3) Conferencista en la Primera Reunión sobre Expertos en Emponzoñamientos por Animales Venenosos, celebrada en Bambito, Panamá (julio de 1996).

1995:

- (1) Conferencia sobre envenenamiento ofídico, dictada en el Hospital San Vicente de Paul, Medellín, Colombia (octubre de 1995).
- (2) Conferencista en el simposio de la Federación de Sociedades Brasileñas de Biología Experimental, celebrado en Sao Paulo, Brasil (agosto de 1995).
- (3) Conferencista en el Simposio de la Sección Panamericana de la Sociedad Internacional de Toxicología, celebrado en Maryland, USA (julio de 1995).
- (4) Conferencista en el Simposio 'Envenomings and Their Treatments', celebrado en el Instituto Pasteur, París, Francia (mayo de 1995).

1993:

- (1) Conferencista en el Simposio de la Sección Europea de la Sociedad Internacional de Toxicología, celebrado en Arezzo, Italia (setiembre de 1993).

1990:

- (1) Conferencista en el Simposio de la Sociedad Brasileira de Toxicología, celebrado en el Instituto Butantan, Sao Paulo, Brasil (setiembre de 1990).
- (2) Conferencista en el Primer Simposio Brasileño de Bioquímica de Proteínas, celebrado en Campinas, Brasil (marzo de 1990).

1989:

- (1) Profesor invitado al curso sobre 'Efectos locales inducidos por venenos de serpientes', celebrado en el Instituto Butantan, Sao Paulo, Brasil (octubre de 1989).

1988:

- (1) Conferencista en el Congreso Mundial de la Sociedad Internacional de Toxinología, celebrado en Oklahoma, USA (agosto de 1988).

1986:

- (1) Conferencista en el Simposio de la Sección Panamericana de la Sociedad Internacional de Toxicología, celebrado en Arizona, USA (mayo de 1986).

1984:

- (1) Participante en el Simposio de la Sección Panamericana de la Sociedad Internacional de Toxicología, celebrado en Oklahoma, USA (mayo de 1984).

Proyectos de investigación en los que ha fungido como investigador principal:

- (1) Regeneración muscular posterior a mionecrosis inducida por el veneno de *Bothrops asper* (1984-1987): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (2) Capacidad neutralizante del suero antiofídico polivalente hacia efectos y actividades de los venenos costarricenses de la familia Viperidae (1984-1989): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (3) Producción de suero anti-miotoxina de *Bothrops asper*: desarrollo de una técnica inmunológica para detección de la toxina y estudios de neutralización (1985-1987): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (4) Patogénesis de la necrosis de músculo esquelético causada por inoculaciones de una miotoxina aislada del veneno de *Bothrops nummifer* (1987-1989): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (5) Isolation, biochemical characterization and mechanism of action of myotoxins from the venom of the snake *Bothrops asper* (terciopelo) (1989-1992): Third World Academy of Sciences (TWAS).
- (6) Production and neutralizing capacity of an antivenom for the treatment of snakebite envenomations in Central America (1986-1991); International Foundation for Science (IFS).
- (7) Evaluación de las actividades anti-hemorrágica, anti-coagulante y anti-fosfolipasa A₂ en productos naturales obtenidos de plantas y animales (1991-1994): Instituto Nacional de Biodiversidad (INBio).
- (8) Isolation, characterization and neutralization of hemorrhagic toxins from the venom of the snake *Bothrops asper* (1991-1995): Agency for International Development (AID), USA.
- (9) Ofidismo en Antioquia y Chocó: ensayo clínico terapéutico de un antiveneno monovalente anti-*Bothrops atrox* vs el antiveneno polivalente de Costa Rica (1994-1996): COLCIENCIAS, Colombia.

- (10) Caracterización inmunoquímica y biológica de los venenos de *Lachesis muta* de Brasil, Colombia y Costa Rica (1996-1997): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (11) Estudio comparativo de la acción citotóxica de fosfolipasas A₂ en cultivos celulares (1996-1997): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (12) Activación de metaloproteinasas de matriz en músculo esquelético inyectado con toxinas de veneno de *Bothrops asper*: su papel en la degradación de la matriz extracelular (1999-2000): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (13) Estudio comparativo sobre la bioquímica, la toxicología y la inmunología de venenos de serpientes de Centroamérica (1999-2000): NeTropica.
- (14) Estudios inmunológicos sobre los sueros antiofídicos producidos en Costa Rica (2001-2004): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (15) Mechanism of action of hemorrhagic metalloproteinases isolated from the venom of *Bothrops asper*, the most important venomous snake in Central America (2001-2004): Wellcome Trust (United Kingdom).
- (16) Efecto de toxinas de acción local del veneno de la serpiente *Bothrops asper* en la infección de tejido muscular por *Staphylococcus aureus* (2001-2003): NeTropica.
- (17) Farmacocinética de antivenenos en conejos inyectados con veneno de *Bothrops asper*: hacia una terapia más racional del envenenamiento ofídico (2004-2008): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (18) Impacto del envenenamiento por mordedura de serpiente en Medicina Veterinaria: Evaluación de la magnitud del problema y búsqueda de soluciones (2006-2008): Fondos FEES-CONARE, Costa Rica.
- (19) Serino proteinasas del veneno de *Bothrops asper*: caracterización de su papel en la patogénesis del daño tisular local y en la activación de metaloproteinasas de matriz (2006-2008): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (20) Caracterización proteómica de venenos de serpientes de relevancia médica en Centroamérica (2007-2008): Fundación CRUSA.
- (21) Regeneración muscular posterior a necrosis inducida por veneno y toxinas de *Bothrops asper*: papel de las alteraciones vasculares y la revascularización en el proceso regenerativo (2007-2010): Vicerrectoría de Investigación, Universidad de Costa Rica.

- (22) Venómica y antivenómica de serpientes de interés bimédico en Costa Rica y la región centroamericana (2008-2011): Fundación CRUSA.
- (23) Uso de la proteómica para el estudio de dos tipos de enfermedades tropicales desatendidas de importancia en Costa Rica (2009-2011): Fondos FEES-CONARE, Costa Rica.
- (24) Antivenómica de venenos de serpientes de Centroamérica: uso de la proteómica en el mejoramiento de los antivenenos (2011-2012): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (25) Modulación de la inflamación y la regeneración tisular en dos modelos experimentales de patología tropical: necrosis por veneno de serpiente e infección por un patógeno bacteriano (2011-2013): Fondos FEES-CONARE, Costa Rica.
- (26) Biotecnología para prevención y tratamiento de dos enfermedades tropicales: desarrollo de una vacuna para brucelosis y mejoramiento de los antivenenos (2012-2014): Fondos FEES-CONARE, Costa Rica.
- (27) Dermonecrosis inducida por el veneno de la cobra *Naja nigricollis*: patogénesis del daño tisular y búsqueda de alternativas terapéuticas novedosas (2014-2016): Vicerrectoría de Investigación, Universidad de Costa Rica.
- (28) Novel immunoproteomic strategies to develop a polyspecific, non-cold chain liquid snake antivenom with unparalleled sub-Saharan efficacy (2014-2018): Medical Research Council, United Kingdom.
- (29) Alteraciones generadas por diferentes tipos de metaloproteinasas hemorrágicas de venenos de serpientes sobre componentes de la microvasculatura: desarrollo de un modelo utilizando microscopía confocal (2015-2018): Vicerrectoría de Investigación, Universidad de Costa Rica.

Tutorías de estudiantes de posgrado:

Estudiantes de Maestría:

- (1) Carmen Isabel Valiente, Programa de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica (1991).
Título de la tesis: Estudio electroforetico de fosfolipasa A₂ en venenos de serpientes de las familias Viperidae y Elapidae.
- (2) José Antonio Gené Valverde, Programa de Posgrado CSUCA-Instituto Karolinska (1990).
Título de la tesis: Studies on the mechanism of action of myotoxin II, a toxin of *Bothrops asper* (Fer-de-Lance) snake venom.

- (3) Lisela Moreira Carmona, Programa de Posgrado en Biología, Universidad de Costa Rica (1996).
Título de la tesis: Alteraciones tempranas inducidas por el veneno de terciopelo, *Bothrops asper* (Serpentes: Crotalidae), en la microvasculatura del músculo esquelético murino.
- (4) Cecilia Díaz Oreiro, Programa de Posgrado en Ciencias Biomédicas, Universidad de Costa Rica (1992).
Título de la tesis: Caracterización bioquímica y biológica de dos toxinas aisladas del veneno de *Bothrops godmani* (toboba de altura).
- (5) Yamileth Angulo Ugalde, Programa de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica (1995).
Título de la tesis: Alteraciones fisiopatológicas y desarrollo de la respuesta humoral en equinos inmunizados con veneno de serpiente para la producción de suero antiofídico.
- (6) Alexandra Rucavado Romero, Programa de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica (1995).
Título de la tesis: Efectos patológicos inducidos por BaP1 y caracterización inmunológica de BaH1 y BaP1, dos hemorraginas del veneno de *Bothrops asper* (Terciopelo).
- (7) Fernando Chaves Mora, Programa de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica (1992).
Título de la tesis: Cambios fisiopatológicos y bioquímicos inducidos en ratones inoculados con los venenos de serpientes recién nacidas y adultas de *Bothrops asper*.
- (8) Teresa Escalante Muñoz, Programa de Posgrado en Microbiología, Parasitología y Química Clínica, Universidad de Costa Rica (2004).
Título de la tesis: Efectos sistémicos inducidos por metaloproteinasas hemorrágicas de venenos de serpientes: comparación entre una metaloproteinasa P-I y una P-III.

Estudiantes de Doctorado:

- (1) Alberto Alape Girón, Programa de Posgrado CSUCA-Instituto Karolinska (1997).
Título de la tesis: Immunochemical, biochemical and evolutionary studies on *Micrurus nigrocinctus nigrocinctus* venom toxins.
- (2) Alexandra Rucavado Romero, Programa de Doctorado en Ciencias de la Universidad de Costa Rica (2006).
Título de la tesis: Componentes del veneno de *Bothrops asper* que afectan la hemostasis y su papel en el desarrollo del síndrome hemorrágico.

- (3) Fernando Chaves Mora, Programa de Doctorado en Ciencias de la Universidad de Costa Rica (2006).
Título de la tesis: Papel de mediadores inflamatorios en los procesos de lesión tisular local posterior a inyecciones de venenos de serpientes del género *Bothrops*.
- (4) Guillermo León Montero, Programa de Doctorado en Ciencias de la Universidad de Costa Rica (2008).
Título de la tesis: Estudio de los mecanismos patogénicos que operan en las reacciones anafilactoides presentadas durante la administración de antivenenos.
- (5) Teresa Escalante Muñoz, Programa de Doctorado en Ciencias de la Universidad de Costa Rica (2011).
Título de la tesis: Alteraciones de las proteínas de la membrana basal provocadas por las metaloproteinasas de venenos de serpiente y su relación con el mecanismo de lesión de la microvasculatura.