CURRICULUM VITAE

NAME: **Keiko SHIRAI**
WORK ADDRESS: Universidad Autónoma Metropolitana. Biotechnology Department, Laboratory of Biopolymers and Pilot Plant of Bioprocessing of Agro-Industrial and Food By-Products, Av. San Rafael Atlixco No. 186. Col. Vicentina, C.P. 09340. Iztapalapa, México City,
E-mail address smk@xanum.uam.mx/ kshiram@gmail.com

CURRENT POSITION
Titular Professor full time level C (highest level) since 1999 at Universidad Autonoma Metropolitana-Iztapalapa. Member of National Researchers Council (SNI) since 1996. Currently Researcher Level III (the highest).

POSITION
Associated Professor at Universidad Autonoma Metropolitana-Iztapalapa 1992-1996 Research Assistant at Universidad Autonoma Metropolitana-Iztapalapa 1989-1992

RESEARCH VISITOR AND TRAINING:
University of Loughborough United Kingdom Chemical Engineering Department. Supervisor Dr. George M. Hall. July 1996 to October 1997.
University of Huddersfield, Food Science and Technology. Supervisor Dr. Valerie M. Marshall. Project: Studies of Phytic acid: Utilization of phytate by some lactic acid bacteria. Interaction between phytic acid and milk proteins, UAM/University of Huddersfield, funded by British Council. Ref. MEX/992/41. March-April 1993.
Research contract project: "Non dairy lactic Fermentations: Production of a yogurt-like product from amilaceous foodstuffs and whey", funded by Economic European Community (C.E.E.), Contract CII.197. MEX (H). 1989-1991. Most significant outputs: 2 papers published in ISI journals and 2 conference papers.

TEACHING AND RESEARCH SKILLS:

TEACHING

POSTGRADUATE LEVEL

- Doctorate theses: 12 concluded and 5 current;
- Master Sciences: 24 concluded and 4 current;
- Speciality training in Biotechnology (one year of research): 5 concluded;
- I have participated in the training of graduate and postgraduate students: “Biopolymers in materials and life sciences” with the topic: Utilization of agricultural and aquatic wastes, for biopolymer isolation, enzyme production and metabolite production. This course was given in several countries as part of the activities of the Alfa project POLYLIFE funded by European Union:
- I have participated and coordinated the workshop Club of young scientist: workshop of Microbial diversity, funded by L'Institut de recherché pour le développement (IRD France) and Biological Sciences Faculty Universidad Autónoma Metropolitana. 22 July to 1 August 2003 Lenght 50 hours.

UNDERGRADUATE LEVEL

- Bachelor degree thesis: 72 concluded
- Have lead 200 courses for undergraduates in Biotechnology department in Basic Microbiology, Food Microbiology, Dairy Technology, Fermented Foods and Food Chemistry.

RESEARCH
Grants and funding:

1 Innovation Fund from Secretary of Economy and National Council for Research and Technology (CONACyT) current
1 Technology transfer and Innovation Fund from Secretary of Economy and National Council for Research and Technology (CONACyT) concluded
2 Institute of Science and Technology of Mexico City (ICyTDF), concluded and current
1 National Council in Fisheries (CONAPESCA) Research and transfer of technology 1 concluded;
6 National Council for Research and Technology (CONACyT) projects: 5 concluded, 1 current;

4 international projects: 1 Bilateral Cooperation Project in Science and Technology France, 1 Alfa funded by European Union and 2 Higher Education Link Programmes funded by British Council concluded;

1 Contract with industry for transfer of technology of the patented process on the utilization of shrimp wastes for added value compounds current until 2014.

PUBLICATIONS (ISI JOURNALS)

1. Cross-Linking Chitosan into Hydroxypropylmethylcellulose for the Preparation of Neem Oil Coating for Postharvest Storage of Pitaya (Stenocereus pruinosus). Molecules 2019, 24, 219. https://doi.org/10.3390/molecules24020219
2. Effect of bio-chemical chitosan and gallic acid into rheology and physicochemical properties of ternary edible films. (2019) International Journal of Biological Macromolecules 125:149-158. https://doi.org/10.1016/j.ijbiomac.2018.12.060
3. Improved Thermal and Reusability Properties of Xylanase by Genipin Cross-Linking to Magnetic Chitosan Particles. (2018). Applied Biochemistry and Biotechnology https://doi.org/10.1007/s12010-018-2928-7
4. Polyelectrolyte complex of Aloe vera, chitosan, and alginate produced fibroblast and lymphocyte viabilities and migration. (2018) Carbohydrate Polymers 192: 84-94
5. Enhanced oil recovery by hydrophobins from Lecanicillium lecanii. (2018). Fuel 224:10-16. https://doi.org/10.1016/j.fuel.2018.03.058
6. Polycyclic aromatic hydrocarbon-emulsifier protein produced by Aspergillus brasiliensis (niger) in an airlift bioreactor following electrochemical pretreatment. (2018). Bioresource Technology DOI: 10.1016/j.biortech.2018.02.043
7. Production and characterization of a nanocomposite of highly crystalline nanowhiskers from biologically extracted chitin in enzymatic Poly(ε-caprolactone). (2018). Carbohydrate Polymers 181 684–692. https://doi.org/10.1016/j.carbpol.2017.11.094
8. In vitro and in vivo assessment of lactic acid-modified chitosan scaffolds for potential treatment of full-thickness burns. (2017). Journal of Biomedical Materials Research A. 105(10):2875-2891. doi: 10.1002/jbm.a.36132.
9. Hydroxyapatite crystallization in shrimp cephalothorax wastes during subcritical water treatment for chitin extraction. Carbohydrate Polymers 172 (2017) 332–341. http://dx.doi.org/10.1016/j.carbpol.2017.05.055
10. Successive inoculation of Lactobacillus brevis and Rhizopus oligosporus on shrimp wastes for recovery of chitin and added-value products. Process Biochemistry (2017), 58:17-24 DOI: 10.1016/j.procbio.2017.04.036.
11. Fungal biocatalyst activated by an electric field: Improved mass transfer and non-specificity for hydrocarbon degradation in an airlift bioreactor. Journal of Hazardous Materials 337 (2017) 62–71. http://dx.doi.org/10.1016/j.jhazmat.2017.05.001
12. "Lactic Acid Fermentation: Drawing on Waste from Fishery and Agricultural Industries." 2017. The International Journal of Science in Society 8 (4): 1-8. doi:10.18848/1836-6236/CGP/v08i04/1-8.
13. Addition of abscisic acid increases the production of chitin deacetylase by Colletotrichum gloeosporioides in submerged culture. Process Biochemistry 2016, DOI: 10.1016/j.procbio.2016.05.003
14. Postharvest preservation of cactus fruits (Stenocereus pruinosus and Stenocereus stellatus) produced in semidesertic area of Oaxaca by biopolymer coatings. The International Journal of Science in Society. In press
15. Inhibition of Listeria monocytogenes in Fresh Cheese using Chitosan-grafted Lactic Acid Packaging. Molecules 2016, 21, 469; doi:10.3390/molecules21040469.
16. Papaya (Carica papaya) and tuna (Thunnus albacares) by-products fermentation as biomanufacturing approach towards antioxidant protein hydrolysates. Revista Mexicana de Ingeniería Química. 2016. 15 (1): 91-100
17. Enzymatic hydrolysis of chitin pretreated by rapid depressurization from supercritical 1,1,1,2-tetrafluoroethane toward highly acetylated oligosaccharides. Bioresource Technology. (2016). 209:180-186. doi: 10.1016/j.biortech.2016.02.138. PubMed PMID: 26970920.
18. Suppression of the tert-butylhydroquinone toxicity by its grafting onto chitosan and further cross-linking to agavin toward a novel antioxidant and prebiotic material. Food Chemistry (2016). 199:485–491. http://dx.doi.org/10.1016/j.foodchem.2015.12.042

19. Physicochemical and Antioxidant Properties of Chitosan Films Incorporated with Cinnamon Oil. International Journal of Polymer Science Volume 2015, Article ID 974506. http://dx.doi.org/10.1155/2015/974506
20. Enzymatic syntheses of linear and hyperbranched poly-l-lactide using compressed R134a–ionic liquid media. J. of Supercritical Fluids 103 (2015) 77–82. http://dx.doi.org/10.1016/j.supflu.2015.04.024
21. The hydrophobicity of the support in solid state culture affected the production of hydrophobins from Lecanicillium lecanii. Process Biochemistry 50 (2015) 14–19
22. Chitosan-PLA based scaffold improves wound healing in a burned animal model. Journal of Tissue Engineering and Regenerative Medicine. 8(1):196.
23. Growth of the fungus Paecilomyces lilacinus with n-hexadecane in submerged and solid-state cultures and recovery of hydrophobin proteins. Process Biochemistry 49 (2014): 1606–1611.
24. Rheological and antioxidant power studies of enzymatically grafted chitosan with a hydrophobic alkyl side chain. Food Hydrocolloids 39 (2014): 113-119 (10.1016/j.foodhyd.2013.12.030)
25. Fibroblast viability and inhibitory activity against Pseudomonas aeruginosa in Lactic acid-grafted Chitosan Hydrogels. Journal of Applied Polymer Science. 2014 131(14): 40252, doi: 10.1002/app.40252
26. Preparation of Biological Fish Silage and its Effect on the Performance and Meat Quality Characteristics of Quails (Coturnix coturnix japonica). (2013). Brazilian Archives of Biology and Technology 56(6):1002-1010.
27. Ultrasonication and Steam-explosion as Chitin pretreatments for chitin oligosaccharide production by Chıtınases of Lecanicillium lecanii. (2013). Bioresource Technology. 146:794–798.
28. Trametes versicolor Laccase Oxidation of Gallic acid toward a Polyconjugated Semiconducting Material. (2013). Journal of Molecular Catalysis B: Enzymatic. 97:100-105.
29. Enzymatic grafting of gallate ester onto chitosan: evaluation of antioxidant and antibacterial activities. (2013). International Journal of Food Science and Technology. 48, 2034–2041.
30. Activity of Chitin Deacetylase from Colletotrichum gloeosporioides on Chitinous Substrates. (2013). Carbohydrate Polymers. 96:227-232.
31. Morphological changes, chitinolytic enzymes and hydrophobin-like proteins as responses of Lecanicillium lecanii during growth with hydrocarbon. (2013). Bioprocess and Biosystems Engineering 36:531–539.
32. Lipase-catalyzed Synthesis of Hyperbranched Poly-L-lactide in an Ionic Liquid. (2013) Bioprocess and Biosystems Engineering 36:383–387
33. Effects of protein and lipids on growth performance, feed efficiency and survival rate in fingerlings of bay snook (Petenia splendida). 2012. International Journal of Animal and Veterinary Advances 4(3): 204-213.
34. Chitin and L(+)-lactic acid production from crab (Callinectes bellicosus) wastes by fermentation of Lactobacillus sp B2 using sugar cane molasses as carbon source. 2012. Bioprocess and Biosystems Engineering 35(7):1193–1200. DOI 10.1007/s00449-012-0706-4
35. Effects of including shrimp protein hydrolysate in practical diets on the growth and survival of redclaw crayfish hatchlings Cherax quadricarinatus (Von Martens, 1868). 2012. Aquaculture Research 44(6):966-973. doi:10.1111/j.1365-2109.2012.03102.x
36. Enzymatic modification of chitosan with quercetin and its application as antioxidant edible films. 2012. Applied Biochemistry and Microbiology 48(2): 149-156.
37. Structural characterization of chitin and chitosan obtained by biological and chemical methods. 2011. Biomacromolecules 12, 3285–3290.
38. Production and activities of chitinases and hydrophobins from *Lecanicillium lecanii*. 2011. Bioprocess and Biosystems Engineering 34:681-686.
39. Postharvest Litchi (*Litchi chinensis* Sonn.) Quality Preservation by *Lactobacillus plantarum*. 2011. Postharvest Biology and Technology 59(2):172-178
40. Producción de ensilados biológicos a partir de desechos de pescado, del ahumado de atún aleta amarilla (*Thunnus albacares*) y del fileteado de tilapia (*Oreochromis* sp), para la alimentación de especies acuícolas. 2010. Revista Mexicana de Ingenieria Quimica 9(2):167-178.
41. The effect of pH on the production of chitinolytic enzymes of *Verticillium fungicola* in submerged cultures. 2010. Bioresource Technology 101 (23) 9236-9240.

42. Chitosan-based microcapsules containing grapefruit seed extract grafted onto cellulose fibres by a non-toxic procedure. 2010. Carbohydrate Research 345(6):854-859.
43. Development of operational strategies to remove carbon dioxide in photobioreactors. 2009. Chemical Engineering Journal 153 (1-3), pp. 120-126.
44. Synthesis of a chitin-based biocomposite for water treatment: Optimization for fluoride removal. 2009. Journal of Fluorine Chemistry 130: 718–726.
45. Hydrophobic response of the fungus Rhinocladiella similis in the biofiltration with volatile organic compounds with different polarity. 2009. Biotechnology letters 31:1203-1209.
46. Cross-linking Chitosan into UV-irradiated Cellulose Fibers for the Preparation of Antimicrobial-finished Textiles. 2009. Carbohydrate Polymers, 77(3):536–543.
47. Effect of *Lactobacillus plantarum* and chitosan in the reduction of browning of pericarp Rambutan (*Nephelium lappaceum*). 2009. Food Microbiology 26(4):444-449.
48. Effect of temperature on chitin and astaxanthin recoveries from shrimp waste using lactic acid bacteria. 2009. Bioresource Technology, 100(11):2849-2854.
49. Chitosan selectivity for removing Cadmium (ii), Copper (ii), and Lead (ii) from aqueous phase: pH and organic matter effect. 2009 Journal of Hazardous Materials, 162(1):503–511.
50. Efecto de la calidad del agua y tamaño de partícula en la producción de quitosano a partir de β-quitina extraída de desperdicios de calamar gigante (*Dosidicus gigas*). 2008. Revista Mexicana de Ingenieria Quimica 7(3):299-307.
51. Utilization of fisheries by-catch and processing wastes for lactic acid fermented silage and evaluation of degree of protein hydrolysis and in vitro digestibility. 2008. Revista Mexicana de Ingenieria Quimica 7(3):195-204.
52. Biocontrol potential and polyphasic characterization of novel native *Trichoderma* strains against *Macrophomina phaseolina* isolated from sorghum and common bean. 2008. Applied Microbiology and Biotechnology. 80(1): 167-77
53. Toluene gas phase biofiltration by *Paecilomyces lilacinus* and identification of a hydrophobin protein from produced thereof. 2008. Applied Microbiology and Biotechnology. 80:147-154.
54. Evaluation of chitosans and *Pichia guillermondii* as growth inhibitors of *Penicillium digitatum*. 2008. International Journal of Biological Macromolecules 43:20–26.
55. Effect of moisture content in polyurethane foams as support for solid-substrate fermentation of *Lecanicillium lecanii* on the production profiles of chitinases. 2008. Process Biochemistry. 43 (1): 24–32
56. One-solvent Extraction of Astaxanthin from Lactic acid Fermented Shrimp Wastes. 2007. Journal of Agricultural and Food Chemistry. 55:10345–10350.
57. Chitin sponge, extraction procedure from shrimp wastes using green chemistry. Journal of Applied Polymer Science 104(2007):3909-3916.
58. Enzymatic hydrolysis of chitin in the production of oligosaccharides using *Lecanicillium fungicola* chitinases. Process Biochemistry 41 (2006) 1106–1110.
59. Production of β-N-acetylhexosaminidase of *Verticillium lecanii* by solid state and submerged fermentations utilizing shrimp waste silage as substrate and inducer. 2004. Process Biochemistry 39(6):665-671.
60. Effect of chitosan and temperature on spore germination of *Aspergillus niger*. 2003. Macromolecular Bioscience 3(10):582–586.
61. Feasibility of fishmeal replacement by shrimp-head silage protein hydrolysate in Nile tilapia (*Oreochromis niloticus* (L)) diets. 2002. Journal of the Science of Food and Agriculture 82:753-759.
62. Fermentación láctica de cabezas de camarón (Penaeus sp) en un reactor de fermentación sólida. 2002. Revista Mexicana de Ingeniería Química 1:45-48.
63. Pilot scale lactic acid fermentation of shrimp wastes for chitin recovery. 2002. Process Biochemistry 37:1359-1366.
64. Effect of initial glucose concentration and inoculation level of lactic acid bacteria in shrimp waste ensilation. 2001. Enzyme Microbial Technology, 28:446-452.
65. Fermentación láctica de camarón (*Penaeus*). Avances en Ingeniería Química.Vol. 3: 4-11.1996.
66. Ability of some strains of lactic acid bacteria to degrade phytic acid. Letters in Applied Microbiology. 1994, 19:366-369.

67. Studies on bacterial acidification process of cassava. Journal of the Science of Food and Agriculture. 1992, 60:457-463.
68. Production of a yogurt-like product from plant foodstuffs and whey. Substrate preparation. Journal of the Science of Food and Agriculture. 1992, 59:199-204.
69. Production of a yogurt-like product from plant foodstuffs and whey. Sensory evaluation and physical attributes. Journal of the Science of Food and Agriculture. 1992, 59:205-210.

PROCEEDING PAPERS/ CHAPTERS OF BOOKS

1. Submerged and solid support production and molecular identification of chitin deacetylases from phytopathogenic fungi. Advances in Chitin Science volume XIV. Pp. 48. ISBN 978-85-63191-03-8 (v.14)
2. Crude enzyme of Colletotrichum gloeosporioides with chitin deacetylase activity on chitinous substrates. Advances in Chitin Science volume XIV. Pp. 61. ISBN 978-85-63191-03-8 (v.14).
3. Enzymatic hydrolysis of chitin by chitinases from Lecanicillium lecanii. Advances in Chitin Science volume XIV. Pp. 67. ISBN 978-85-63191-03-8 (v.14).
4. Synthesis and characterization of antimicrobial chitosan cocitric films. Advances in Chitin Science volume XIV. Pp. 232. ISBN 978-85-63191-03-8 (v.14).
5. Utilisation of fish processing by-products for bioactive compounds. In: Fish Processing-Sustainability and New Opportunities. 2010. George M. Hall (ed.). Wiley-Blackwell Publishing Published Online: 8 SEP 2010 Print ISBN: 9781405190473. Online ISBN: 9781444328585. DOI: 10.1002/9781444328585.236-265 pp
6. Production and activity of chitinases and hydrophobins obtained from solid and liquid cultures of *Lecanicillium lecanii*. Advances in Chitin Science. Volumen XII. T.Franco, M.G. Peter (eds.) Campinas, Brazil ISBN 978-85-64131-00-2. Editorial State University of Campinas. 38-41 pp.
7. Microbial treatment of shrimp waste for recovery of chitin and astaxanthin. Advances in Chitin Science. Volumen XII. T.Franco, M.G. Peter (eds.) Campinas, Brazil ISBN 978-85-64131-00-2. Editorial State University of Campinas. 80-84 pp
8. Evaluation of chitinolytic activities of *Lecanicillium* strains cultivated with addition of hydrocarbons as carbon source. 2007. Advances in Chitin Science, volume IX. A. Domard, E. Guibal, K. M. Vårum (eds.) Montpellier Francia. 492-497.
9. Application of chitosans and yeast as growth inhibitors of *Penicillium digitatum*. 2007. Advances in Chitin Science, volume IX. A. Domard, E. Guibal, K. M. Vårum (eds.) Montpellier Francia. 402-406.
10. Fungal chitinases. In: Advances in Agricultural and Food Biotechnology, 2006: ISBN: 81-7736-269-0. Editors: Ramón Gerardo Guevara-González and Irineo Torres-Pacheco. Research Signpost 37/661 (2), Fort P.O., Trivandrum-695 023, Kerala, India 289-304 pp
11. Evaluation of pH of culture on the chitinolytic and proteolytic activities of *Verticillium fungicola* using shrimp waste silage. 2004. Advances in Chitin Science, volume VII. Boucher I, Jamieson K and Retnakaran A (eds.) Montreal. 222-225.
12. Efecto del tratamiento térmico sobre el contenido de fitato en leche de soya, harina de avena y concentrados proteicos de amaranto. Tecnol. Alim.(México). 1996. 31(2):11-15.
13. Chitinases production in solid state fermentation and submerged fermentation by *Verticillium lecanii* with silage shrimp as substrate 2001. Chitin Enzymology. Edited by R.A.A. Muzzarelli, Atec Edizioni, Italia. 381-389. ISBN 88-86889-06-2.
14. Substitution of fishmeal for proteins from shrimp fermented wastes in practical diets for nile tilapia (*Oreochromis niloticus*). 2001. Proceedings of the 8th International Congress on Engineering and Food (ICEF). Vol. II: 2013-2017. Edited by J. Welti-Chanes, G.V. Barbosa-Cánovas, J.M. Aguilera.Technomic Publishing Co., Inc.Estados Unidos de América. ISBN 1-56676-951-5.
15. Chitinases production by fungi: Initial Screening. 2001. Proceedings of the 8th International Congress on Engineering and Food (ICEF). Vol. II: 1998-2002. Edited by J. Welti-Chanes, G.V. Barbosa-Cánovas, J.M. Aguilera.Technomic Publishing Co., Inc.Estados Unidos de América. ISBN 1-56676-951-5.
16. Effects of treatments on the quality of papaya fruit during storage. 2001. Proceedings of the 8th International Congress on Engineering and Food (ICEF). Vol. II: 1042-1046. Edited by J. Welti-Chanes, G.V. Barbosa-Cánovas, J.M. Aguilera.Technomic Publishing Co., Inc.Estados Unidos de América. ISBN 1-56676-951-5.

17. Scaling up of lactic acid fermentation of prawn wastes in packed-bed column reactor for chitin recovery. 2000. Advances Chitin Science Vol. 4:21-27. Edited by M.G. Peter, A. Domard, y R.A.A. Muzzarelli. University of Potsdam, Alemania ISBN 3-9806494-5-8.
18. Characterisation of chitins from lactic acid fermentation of prawnwastes. 1999. Advances in Chitin Science. Volumen III. Edited by Chen,R.H. Chen,C.H. Rita Advertising Co., Ltd. Taiwan, Rep. de China. 103-110. ISBN 957-02-3721-X.
19. Evaluación de diferentes fuentes de carbono para el escalamiento de una fermentación láctica de camarón. 1998. Productos Naturales: un enfoque biotecnológico. Volumén IV:123-127.
20. Aspects of protein breakdown during the lactic acid fermentation. 1997. Advances in Chitin Science Volumén II:56-63. Edited by Domard, A., Roberts, F.A.F. y Vârum K.M. Jacques André Publisher. Lyon, Francia. ISBN 9782907922579-51100.
21. Extracción de pigmentos a partir de cefalotórax de camarón (*Penaeus sp*.). 1997. Productos Naturales Perspectivas Biotecnológicas. Volumén III. 97-102. J.C. Peña Avila, J.A. Lechuga y F. Cruz Sosa (editores). Universidad Autónoma Metropolitana. México, D.F. ISBN: 970-654-120-9.
22. Quitina: ocurrencia, propiedades y aplicaciones. 1996. Ciencia 47(4):317-328.
23. Bacterias Lácticas en alimentos fermentados. 1996. Ciencia 47(2):125-137.
24. Influencia de la inoculación y actividad amilolítica nativa en la fermentación de la yuca. Avances de Ingeniería Química 1989. Publicado. Tomo I. Editado por Universidad de Guadalajara. 1991:541-546.

PATENTS

1. Proceso de recuperación mejorada de petróleo utilizando hidrofobinas Presentada en Instituto Mexicano de Propiedad Industrial (IMPI) el 17 de diciembre de 2018. No. MX/a/2018/015934.
2. Recubrimiento para la conservación poscosecha de frutas y hortalizas perecederas Mexican Institute of Industrial Property (IMPI) el 19 May 2017. No. MX/a/2017/006635.
3. Thermoplastic matrix of biodegradable polymers for heavy metal removal in continuous process. Mexican Institute of Industrial Property (IMPI). 3 December 2015. No. MX/2015/088546.
4. Chitin extraction by enzymatic means. IMPI. 22 July 2013. No. MX/E/2013/051458.
5. Bioreactor for obtaining chitin and astaxanthin by *Lactobacillus* and proteases from shrimp waste. IMPI. 8 June 2011. No. MX/E/2011/038383.
6. Chitin-chitosan bloc co-polymers. Patente Internacional PCT (Patent Cooperation Treaty). National Institute of Industrial Property (Paris, France) 17 December 2010. Demande Internationale N° PCT/FR 10/000849. Título de Patente No. No.353088 Fecha de expedición 20 de julio de 2018
7. Cellulose textile funcionalization and crosslinking to essential oil microcapsules. IMPI No. 320341 9 May 2014. International Clasification C11:D3/37; D06M15/564.
8. Utilization of shrimp wastes for the recovery of chitin, pigments, protein hydrolysates and calcium by fermentation. IMPI. No. 247295. Int. Clasification CI.8:A23J1/04; C08B37/08; C22B26/20.

CONFERENCES AND SCIENTIFIC MEETINGS ATTENDED.

I have presented papers in meetings on Biotechnology, Food Science and Technology, Chitin and Chitosan: 112 papers in International, 75 in National conferences and 12 plenary lectures.

CONFERENCE ORGANIZING

- Member of the Comitee of VI Congreso del Noroeste, II Nacional de Ciencias Alimentarias y Biotecnología. 12-17 de noviembre de 2007, Hermosillo, Sonora, México
- Member of the International Comitee of “IV Iberoamerican Simposium of Chitin” held in Natal Brazil. 5 to 10 May 2007.
- Member of the Comitee of V Congreso del Noroeste, I Nacional de Ciencias Alimentarias y Biotecnología. 7-12 de noviembre de 2005, Hermosillo, Sonora, México
- Member of the International Comitee of “III Iberoamerican Simposium of Chitin” held in Cordova Spain. 25 September to 5 Octuber 2004.
- Member of the International Comitee of 9th International Chitin-chitosan conference, held in Montreal Canada 27 to 30 of August 2003.
- Member of the International Comitee of “II Iberoamerican Simposium of Chitin” joint with VIII Simposio Latinoamericano de Polímeros, VI Congreso Iberoamericano de Polímeros y XV Congreso Nacional de Polímeros held in Acapulco, Guerrero México. 10-15 of November 2002.

AWARDS, FELLOWSHIPS, AND GRANTS

- Research grant by Produce Foundation Oaxaca A.C, (Fundación Produce Oaxaca A.C.)
    - Technological validation to the producers of lichi of state of Oaxaca, Mexico on the quality preservation of Litchi (*Litchi chinensis* Sonn.) in postharvest by *Lactobacillus* and chitosan based coatings
- Research grant by Mexican Council of Fish Resources (CONAPESCA)
    - Technological transfer to the productive sector on the Chemical and biological process for the obtaining of chitin, chitosan, pigments, hydrolyzed protein and calcium from crustacean wastes by fermentation
- Research grant by National Council for Science and Technology (CONACyT)
    - Start-up of the technology of bioprocess of crustacean wastes for chitin, protein hydrolyzates, calcium and chitosan production. FINNOVA- Secretary of Economy Final 2016.
    - Study of the production of hydrolitic enzymes involved in the antagonistic process of mycoparasitic, phytopathogenic and entomopathogenic fungi. Final 2014.
    - Process for the obtaining of chitin, chitosan, pigments, hydrolyzed protein and calcium from crustacean wastes by fermentation. Business and action plan. AVANCE-CONACyT C01-170. Final 2008.
    - Study of extrinsic factors that affecting the production of chitinases by entomopathogenic and mycoparasitic fungi *Lecanicillium lecanii* and *Verticillium fungicola*. CONACyT No. 46173. Final 2008.
    - Production and purification of extracellular chitinases of *Verticillium lecanii*. CONACyT No. 400200-5-J33566-E Final 2004.
- Research grant: Biopolymers in Materials and Life Sciences. Programme of co-operation between higher education institutions (HEI's) of the European Union and Latin America: Alfa. Final 2007.
- Higher Education link programme funded by British government and CONACyT:
    - Separation and purification of proteins from crustacean wastes" UAM/Loughborough University/University of Plymouth. Final 2001.
    - Utilisation of Aquatic Resources by Biotechnology".UAM/Loughborough University Final 1998.
- Member of National Researchers Council (SNI) since 1996. Currently Researcher Level III.
- Accredited as full professor according to the evaluation carried out by Subsecretary of Higher Education and Research (SESIC) of the Secretary of Public Education (SEP), since 2003.
- Capital City Award "Heberto Castillo Martinez" 2011 for young outstanding Mexican scientist, issued by the Mexico City Hall through the Institute of Science and Technology City (ICyTDF) on November 29, 2011.
- Prototype Award in the category "City Competitive Industry" at the Fair of Inventions 2011 Second Week of Scientific and Technological Research, held from 17 to 21 October 2011 issued by the Mexico City Hall through the Institute of Science and Technology City (ICyTDF).
- 2009 Diploma for Research in the Area of Biological Sciences and Health for the paper "Effect of temperature on chitin and astaxanthin recoveries from shrimp waste using lactic acid bacteria", awarded by the Universidad Autonoma Metropolitana November 29, 2010.
- Awarded as member of the most productive research area of Biological Sciences faculty in the Universidad Autónoma Metropolitana campus Iztapalapa in 2007, 2004 and 1999.
- Awarded with the Research Prize of the Biological Sciences Area given by Universidad Autónoma Metropolitana in 2003.
- Teaching grant level D (maximum D minimum A) awarded by Universidad Autónoma Metropolitana 2000 to 2007.
- Permanence grant level C (maximum C minimum A) awarded by Universidad Autónoma Metropolitana 1993 to 2007.
- Extra bonus for high level of teaching and research awarded by Universidad Autonoma Metropolitana levels C, B and A (maximum C minimum A) 1995-present.
- Federation of European Microbiological Society (FEMS) grants to attendance to the VI Internacional Simposium of Lactic Acid Bacteria Eindhoven Netherlands 19 to 23 September 1999.

- European Union grants to attendance to the IV International Conference in Marine Biotechnology, Italy 22 to 29 September 1997.
- British Government grant for training in technology in the University of Loughborough UK 1996-1997.

PROFESSIONAL MEMBERSHIPS

- Member of the Mexican Society of Biotechnology and Bioengineering since 1996.
- Member and founder of the Iberoamerican Society of Chitin and Chitosan (SIAQ) since 2002. Vice-President from 10 May 2007 to 10 June 2010.