

CURRICULUM VITAE

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Professional background

Lic. in Food Technology (1994)	Universidad de Costa Rica
Dipl. –Ing. Lebensmittelingenieurin (2000)	Universität Hohenheim, Germany
Dr. rer. nat. (magna cum laude) (2007)	Universität Hohenheim, Germany

Academic appointments at the Universidad de Costa Rica

2000-2006	Instructor
2007-2009	Guest Professor
2009-2011	Associate Professor
2012-to date	Full Professor

Academic stays abroad

1996-2000	Universität Hohenheim, Stuttgart, Germany. Scholarship Dipl. –Ing. (M.Sc.). Sponsored by the German Academic Exchange Service (DAAD).
2003	Universität Hohenheim, Stuttgart, Germany. Three-month research fellowship (w/ Prof. Dr. Reinhold Carle). Sponsored by the Universidad de Costa Rica and DAAD.
2006-2007	Universität Hohenheim, Stuttgart, Germany. Twelve-month Research Scholarship (w/ Prof. Dr. Reinhold Carle). Sponsored by German Academic Exchange Service (DAAD) and the University of Costa Rica.
2009-2010	Universität Hohenheim, Stuttgart, Germany. Three-month research fellowship (w/ Prof. Dr. Reinhold Carle). Sponsored by the Universidad de Costa Rica and DAAD.
2012-2013	Universität Hohenheim, Stuttgart, Germany. One year research stay sponsored by the University of Costa Rica and the German Academic Exchange Service (DAAD).
2017	Universität Hohenheim, Stuttgart, Germany. Three-month research fellowship (w/ Prof. Dr. Reinhold Carle). Sponsored by the Universidad de Costa Rica and DAAD.

Acknowledgements and appointments abroad

2007	Universität Hohenheim. Dr. rer. nat. (<i>magna cum laude</i> - 1,0)
2010	Jochen Stephan Stipendium

Publications with peer review process

1. Esquivel P (2000) Untersuchungen zur Charakterisierung der Zellwandstruktur texturverbesserten Erdbeerkonserven. Diplomarbeit. Institut für Lebensmitteltechnologie, Universität Hohenheim, Stuttgart.
2. Esquivel P (2004) Los frutos de las c actaceas y su potencial como materia prima. Revista Agronom a Mesoamericana 15: 215-219.
3. Esquivel P, M nscher I, Maier O, Carle R (2004) Efecto de la adici n de pectinesterasa sobre la firmeza de fresas (*Fragaria ananassa* c.v. El Santa) procesadas como mermelada. Reviteca 10: 29-32.
4. Zumbado-Rivera W, Esquivel P, Wong E (2006) Selecci n de una levadura para la producci n de biomasa: Crecimiento de suero en queso. Agronom a Mesoamericana 17: 151-160.
5. Esquivel P (2007) Characterisation of Morphological and Chemical Traits of Costa Rican Fruits from Purple Pitaya (*Hylocereus* sp.) Genotypes. Dissertation Ph.D. University of Hohenheim. 135 p.
6. Esquivel P, Stintzing FC, Carle R (2007) Comparison of morphological and chemical fruit traits from different pitaya genotypes (*Hylocereus* sp.) grown in Costa Rica. Journal of Applied Botany and Food Quality 81: 7-14.
7. Esquivel P, Stintzing FC, Carle R (2007) Fruit characteristics during growth and ripening of different *Hylocereus* genotypes. European Journal of Horticultural Science 72: 231-238.
8. Esquivel P, Stintzing FC, Carle R (2007) Phenolic compound profiles and their corresponding antioxidant capacity in purple pitaya (*Hylocereus* sp.) genotypes. Zeitschrift f r Naturforschung 62c: 636-644.
9. Esquivel P, Stintzing FC, Carle R (2007) Pigment pattern and expression of colour in fruits from different *Hylocereus* sp. genotypes. Innovative Food Science and Emerging Technologies 8: 451-457.
10. Esquivel P, Stintzing FC, Carle R (2007) Bananen – Vom Anbau bis zum Verbrauch. Ern hrung im Fokus 7:220-225.
11. Hasbun J, Esquivel P, Brenes A, Alfaro I (2009) Propiedades f sico-qu micas y par metros de calidad para uso industrial de cuatro variedades de papa. Agronom a Costarricense 33: 77-89.
12. Schweiggert R, Villalobos MG, Esquivel P, Carle R (2009) Development and optimization of low temperature enzyme-assisted liquefaction for the production of colouring foodstuff from purple pitaya (*Hylocereus* sp. [Weber] Britton & Rose). European Food Research and Technology 230: 269-280.
13. Ram rez-Truque C, Esquivel P, Carle R (2011) Neutral sugar profile of cell wall polysaccharides of pitaya (*Hylocereus* sp.) fruits. Carbohydrate Polymers 83: 1134-1138.
14. Schweiggert RM, Steingass CB, Mora E, Esquivel P, Carle R (2011) Carotenogenesis and physico-chemical characteristics during maturation of red fleshed papaya fruit (*Carica papaya* L.). Food Research International 44: 1373–1380.

15. Schweiggert RM, Steingass CB, Heller A, Esquivel P, Carle R (2011) Characterization of chromoplasts and carotenoids of red- and yellow-fleshed papaya (*Carica papaya* L.). *Planta* 234: 1031-1044.
16. Engels C, Esquivel P, Jiménez VM, Gänzle MG, Schieber A (2012) Characterization of phenolic compounds in jocote (*Spondias purpurea* L.) peels by ultra high-performance liquid chromatography/electrospray ionization mass spectrometry (UHPLC/MS). *Food Research International* 46: 557-562.
17. Esquivel P (2012) Pitaya and papaya: color beyond the borders. *In* *Forschung und Lehre am Lehrstuhl Lebensmittel pflanzlicher Herkunft: Eine Zwischenbilanz*. Ed. R. Valet, Shaker Verlag, Aachen. Band 27, p. 192-202. ISBN 978-3-844-1457-0.
18. Esquivel P, Araya-Quesada Y (2012) Características del fruto de la pitahaya (*Hylocereus* sp.) y su potencial de uso en la industria alimentaria. *Revista Venezolana de Ciencia y Tecnología de Alimentos* 3: 113-129.
19. Esquivel P, Jiménez VM (2012) Functional properties of coffee and coffee by-products. *Food Research International* 46: 488-495.
20. Schweiggert RM, Steingass CB, Esquivel P, Carle R (2012). Chemical and morphological characterization of Costa Rican papaya (*Carica papaya* L.) hybrids and lines with particular focus on their genuine carotenoid profiles. *Journal of Agricultural and Food Chemistry* 60: 2577-2585.
21. Villalobos-Gutiérrez MG, Schweiggert RM, Carle R, Esquivel P (2012) Chemical characterization of Central American pitaya (*Hylocereus* sp.) seeds and seed oil. *CyTA - Journal of Food* 10: 78-83.
22. Chacón-Ordóñez T, Esquivel P (2013). Frutos tropicales como fuente de carotenoides: biosíntesis, composición, biodisponibilidad y efectos del procesamiento. *Revista Venezolana de Ciencia y Tecnología de Alimentos* 4: 1-23.
23. Hempel J, Amrehn E, Quesada S, Esquivel P, Jiménez VM, Heller A, Carle R, Schweiggert RM (2014) Lipid-dissolved γ -carotene, β -carotene, and lycopene in globular chromoplasts of peach palm (*Bactris gasipaes* Kunth) fruits. *Planta* 240: 1037-1050.
24. Jiménez VM, Gruschwitz M, Schweiggert RM, Carle R, Esquivel P (2014) Identification of phenolic compounds in soursop (*Annona muricata*) pulp by high-performance liquid chromatography with diode array and electrospray ionization mass spectrometric detection. *Food Research International* 65: 42-46.
25. Montoya-Arroyo A, Schweiggert RM, Pineda-Castro ML, Sramek M, Kohlus R, Carle R, Esquivel P (2014) Characterization of cell wall polysaccharides of purple pitaya (*Hylocereus* sp.) pericarp. *Food Hydrocolloids* 35: 557-564.
26. Schweiggert RM, Kopec RE, Villalobos-Gutiérrez MG, Högel J, Quesada S, Esquivel P, Schwartz, SJ, Carle R (2014) Carotenoids are more bioavailable from papaya than from tomato and carrot in humans: a randomised cross-over study. *British Journal of Nutrition* 111: 490-498.

27. Hempel J, Amrehn E, Quesada S, Esquivel P, Jiménez VM, Heller A, Carle R, Schweiggert RM (2014) Lipid-dissolved γ -carotene, β -carotene, and lycopene in globular chromoplasts of peach palm (*Bactris gasipaes* Kunth) fruits. *Planta* 240: 1037-1050.
28. Esquivel P, Schweiggert RM, Chacón-Ordóñez T, Hempel J, Carle R, Jiménez VM (2015) Formas de deposición de carotenoides en alimentos vegetales y sus posibles implicaciones en su bioaccesibilidad y biodisponibilidad *In* Carotenoides en Agroalimentación y Salud. Melendez-Martínez A (ed.). Editorial Terracota, México. *accepted*
29. Esquivel P (2015) Betalains. *In* Handbook on Natural Pigments in Food and Beverages: Industrial Applications for Improving Color. Carle R & Schweiggert RM (eds.). Elsevier.
30. Jiménez V.M., Viñas M., Vega, V., Esquivel, P. 2015. La pitahaya en Costa Rica. *In* Cultivo y uso de la pitahaya (*Hylocereus* spp.) en el mundo. Calix de Dios, H. & Rodríguez-Canto, A. (eds.). Editorial Universidad Autónoma de Chapingo México. *accepted*.
31. Schweiggert RM, Vargas E, Conrad J, Hempel J, Gras C, Ziegler JU, Mayer A, Jiménez VM, Esquivel P, Carle R (2015) Carotenoids, carotenoid esters, and anthocyanins of yellow-, orange-, and red-peeled cashew apples (*Anacardium occidentale* L.). *Food Chemistry*, 200:274-282.
32. Chacón-Ordóñez, T, Esquivel, P, Jiménez, VM, Carle R, Schweiggert RM (2016) Deposition Form and Bioaccessibility of Keto-carotenoids from Mamey Sapote (*Pouteria sapota*), Red Bell Pepper (*Capsicum annuum*), and Sockeye Salmon (*Oncorhynchus nerka*) Filet. *Journal of Agricultural and Food Chemistry*, 64:1989-1998.
33. Chacón-Ordóñez, T., Schweiggert, R.M., Bosy-Westphal, A., Jiménez, V.M., Carle, R., Esquivel, P. (2017). Carotenoids and carotenoid esters of orange- and yellow- fleshed mamey sapote (*Pouteria sapota* (Jacq.) H.E: Moore & Stearn) fruit and their post-prandial absorption in humans. *Food Chemistry* 221:673-682.
34. Rojas-Garbanzo, C., Gleichenhagen, M., Annerose, H., Patricia, E., Schulze-Kaysers, N., Schieber, A. (2017). Carotenoid profile, antioxidant capacity, and chromoplasts of pink guava (*Psidium guajava* cv. “Criolla”) during fruit ripening. *Food Chemistry*, *accepted*.
35. Zerpa-Catanho D, Esquivel P, Mora-Newcomer E, Sáenz MV, Herrera R, Jiménez VM (2017). Transcription analysis of softening-related genes during postharvest of papaya fruit (*Carica papaya* L. 'Pococí' hybrid). *Postharvest Biology and Technology* 125: 42-51
36. Lieb V.M., Kerfers M.R, Kronmüller A., Esquivel P., Alvarado A., Jiménez V.M., Schmarr H. G., Carle R., Schweiggert R.M., Steingass C.B. (2017). Characterization of mesocarp and kernel lipids from *Elaeis guineensis* Jacq., *Elaeis oleifera* (Kunth) Cortés, and their interspecific hybrids. *Journal of Agricultural and Food Chemistry* 65: 3617–3626.
37. Esquivel, P., Orjuela, A., Barros, M., Osorio-Roa, C. (2017) Potential Opportunities and Challenges for Research Collaboration with Latin America in Agriculture and Food Science. *Journal of Agricultural and Food Chemistry* 65: 8096-8098.

Publications without peer review process

1. Esquivel, P., Mora, E., Carle, R. (2009). Comparison of morphological and chemical fruit traits from promissory papaya genotypes (*Carica papaya*.) grown in Costa Rica. Quality Dynamics of Fruits and Vegetables in the Post-Harvest Phase. Hannover, Alemania
2. Ramírez-Truque, C., Esquivel, P., Araya, Y., Jiménez, V.M., Carle, R. (2009). Estabilidad de las betalaínas en una pulpa pasteurizada de pitaya (*Hylocereus* sp.). IV Congreso Nacional de Ciencia y Tecnología de Alimentos. San José, Costa Rica.
3. Schweiggert, R., Villalobos, M.G. Esquivel, P., Carle, R. (2009). Desarrollo y optimización de la maceración enzimática a bajas temperaturas de pulpa de pitaya roja (*Hylocereus polyrhizus* [Weber] Britton & Rose). IV Congreso Nacional de Ciencia y Tecnología de Alimentos. San José, Costa Rica.
4. Esquivel, P., Kramer, M., Jiménez, V.M., Carle, R. (2010). Anthocyanin profiles and caffeine contents of wet-processed coffee (*Coffea arabica*) husks by HPLC-DAD-MS/MS. 28th International Horticultural Congress. Lisboa, Portugal.
5. Villalobos, M.G., Carle, R., Esquivel, P. (2010). Chemical characterization of pitaya (*Hylocereus* sp.) seeds and fatty acid composition of the seed oil. 28th International Horticultural Congress. Lisboa, Portugal.
6. Schweiggert, R., Villalobos, M.G. Esquivel, P., Carle, R. (2010). Enzyme-assisted liquefaction at low temperatures for the production of colouring foodstuff from purple pitaya (*Hylocereus* sp. [Weber] Britton & Rose). 6th International Congress on Pigments in Food: Chemical, Biological and Technological Aspects. Budapest, Hungría.
7. Esquivel, P. (2011). Pitaya and Papaya: color beyond the borders. Forschung und Lehre am Lehrstuhl: Eine Zwischenbilanz. Stuttgart, Alemania.
8. Montoya, A., Esquivel, P. (2012). Colour changes and betalain profile of pitaya fruit skin (*Hylocereus* sp.) during fruit development. 16th World Congress of Food Science and Technology – IUFoST – Addressing Global Food Security and Wellness through Food Science and Technology. Foz Iguazu, Brasil.
9. Montoya-Arroyo, A., Carle, R., Esquivel, P. (2012). Composition of cell wall polysaccharides of pitaya (*Hylocereus* sp.) fruit peels. 2012. 11th International Hydrocolloids Conference, Biofunctionality and Technofunctionality of Hydrocolloids. Purdue University, Indiana.
10. Schweiggert, R.M., Kopec, R., Riedl K., Quesada S., Esquivel, P., Carle R., Schwartz S.J. (2012). Comparison of β -carotene and lycopene bioavailability from papaya, carrot and tomato” 16th World Congress of Food Science and Technology – IUFoST – Addressing Global Food Security and Wellness through Food Science and Technology, Foz Iguazu, Brasil.
11. Schweiggert, R.M., Mezger, D., Schimpf, F., Steingass, C.B., Heller A., Riedl K., Kopec, R., Quesada S., Esquivel, P., Carl R., Schwartz S.J. (2012). Bioavailability of carotenoids from papaya, tomato, and carrot is modulated by chromoplast morphology. Experimental Biology, San Diego, USA.

12. Viñas, M., Kramer, M., Schweiggert, R.M., Guevara, E., Carle, R., Jiménez, V.M., Esquivel, P. (2012). Identification of phenolic and carotenoid compounds in coffee (*Coffea arabica*) pulp, peels and mucilage by HPLC electrospray ionization mass spectrometry. The 24th International Conference on Coffee Science. San José, Costa Rica.
13. Chacón-Ordóñez, T., Jiménez, V.M., Esquivel, P., Carle, R. (2013). Genuine profiles and bioaccessibilities of carotenoids from red- and yellow-fleshed mamey sapote (*Pouteria sapote*) fruits. Book of Abstracts and Proceedings of the 7th International Congress of Pigments in Food. Novara, Italia. pp. 305-308.
14. Hempel J., Esquivel, P., Carle, R., Schweiggert, R.M. (2013). Carotenoid deposition and profiles in peach palm (*Bactris gasipaes* Kunth). Book of Abstracts and Proceedings of the 7th International Congress of Pigments in Food. Novara, Italia. pp. 35-38.
15. Schweiggert, R.M., Steingass, C.B., Heller, A., Esquivel, P., Carle, R. (2013). Deposition of lycopene, β -carotene, and β -cryptoxanthin in different chromoplast substructures in papaya fruits. Book of Abstracts and Proceedings of the 7th International Congress of Pigments in Food. Novara, Italia. pp. 39-41.
16. Schweiggert, R.M., Kopec, R.E., Cooperstone, J.L., Villalobos-Gutiérrez, M.G., Högel, J., Young, G.S., Quesada, S., Esquivel, P., Schwartz, S.J., Carle, R. (2013). Enhanced bioavailability of carotenoids: The influence of chromoplast morphology, dietary lipid, and thermal processing. Book of Abstracts and Proceedings of the 7th International Congress of Pigments in Food. Novara, Italia. pp. 299-304.
17. Schweiggert R.M., Kopec R.E., Villalobos-Gutierrez M.G., Högel J., Quesada S., Esquivel P., Schwartz S.J., Carle R. (2013). Bioaccessibility and bioavailability of carotenoids from papaya, tomato, and carrot in humans. 7th International Congress of Pigments in Food. Novara, Italia.
18. Esquivel, P., Gruschwitz, M., Carle, R., Jiménez, V.M. (2013). Phenolic compounds in soursop (*Annona muricata*) pulp as detected by HPLC/Electrospray ionization mass spectrometry. 7th World Congress on Polyphenol Applications. Bonn, Alemania.
19. Schweiggert, R., Steingass, C.B., Heller, A., Kopec, R.E., Quesada, S., Esquivel, P., Schwartz, S., Carle, R. 2013. Chromoplasten-Morphologie als entscheidender Einflussfaktor auf die Bioverfügbarkeit von Carotinoiden aus Papaya, Tomate und Karotte. Conference of the German Association of Nutrition. Bonn, Alemania.
20. Chacón-Ordóñez, T., Schweiggert, R.M., Jiménez, V.M., Carle, R., Esquivel, P. (2014). The ultra-structure of mamey sapote (*Pouteria sapota*) chromoplasts. ICS 17th Triennial Symposium on Carotenoids. Park City, Utah.
21. Chacón-Ordóñez, T., Schweiggert, R.M., Jiménez, V.M., Carle, R., Esquivel, P. (2014). The profiles and bioaccessibility of carotenoids from red- and yellow-fleshed mamey sapote (*Pouteria sapota*) fruits. ICS 17th Triennial Symposium on Carotenoids. Park City, Utah.
22. Chacón-Ordóñez, T., Jiménez, V.M., Esquivel, P., Carle, R., Schweiggert R.M. (2014). Caracterización del perfil de carotenoides en diferentes genotipos de zapote (*Pouteria sapota*) y su bioaccessibilidad. XVIII Seminario Latinoamericano y V Congreso Nacional de Ciencia y Tecnología de Alimentos. San José, Costa Rica.

23. Esquivel, P., Viñas, M., Schweiggert, R.M., Gruschwitz, M., Guevara, E., Carle, R., Jiménez, V.M. (2014). Characterization of carotenoids in the peels of coffee (*Coffea arabica*) varieties. ICS 17th Triennial Symposium on Carotenoids. Park City, Utah.
24. Montoya-Arroyo, A., Pineda-Castro, M.L., Sramek M., Kohlus, R., Schweiggert, R.M., Carle, R., Esquivel P. (2014). Caracterización de los polisacáridos de la cáscara de pitaya roja como potencial subproducto de su procesamiento. XVIII Seminario Latinoamericano y V Congreso Nacional de Ciencia y Tecnología de Alimentos. San José, Costa Rica.
25. Viñas, M., Gruschwitz, M., Schweiggert, R.M., Guevara, E., Carle, R., Jiménez, V.M., Esquivel, P. (2014). Identificación de carotenoides y compuestos fenólicos en pulpa, cáscara y mucílago de café (*Coffea arabica* L.) mediante HPLC-PDA/MS. XVIII Seminario Latinoamericano y V Congreso Nacional de Ciencia y Tecnología de Alimentos. San José, Costa Rica.
26. Esquivel, P. (2015). Potential of Underutilized Tropical Plant Sources to Reduce Hidden Hunger. Conferencista invitada en el Department of Food Science and Technology, Ohio State University. Columbus, Ohio.
27. Esquivel, P. (2015). Underutilized Latin American sources of carotenoids for nutritional and health improvement in developing countries. 1st NDSU Annual Conference on Food for Health, Fargo, North Dakota.
28. Esquivel, P. (2015). The role that underutilized tropical plants could play in alleviating hidden hunger. International Congress Hidden Hunger 2015, Stuttgart, Alemania.
29. Esquivel, P., Chacón-Ordóñez, T., Schweiggert, R.M., Carle, R., Jiménez, V.M. (2015). Carotenoid profile and bioaccessibility of carotenoids from red- and yellow- fleshed mameysapote (*Pouteria sapota*) fruits. IFT Meeting 2015, Chicago, Illinois.
30. Esquivel, P., Irías-Mata, A., Schweiggert, R.M., Carle, R., Jiménez, V.M. (2015). Nance (*Byrsonima crassifolia*), a source of lutein and zeaxanthin, macular carotenoids important for human health. IFT Meeting 2015. Chicago, Illinois.
31. Chacón-Ordóñez, T., Schweiggert, R.M., Carle, R., Jiménez, V.M. Esquivel, P., (2015). Bioaccessibility of carotenoids from red- and yellow- fleshed mamey sapote (*Pouteria sapota*) fruits. International Congress Hidden Hunger 2015, Stuttgart, Alemania.
32. Irías-Mata, A., Schweiggert, R.M., Carle, R., Esquivel, P., Jiménez, V.M. 2015. Nance (*Byrsonima crassifolia*) fruits, a source of lutein and zeaxanthin - macular carotenoids involved in human health. International Congress Hidden Hunger 2015, Stuttgart, Alemania.
33. Jiménez, V.M., Vargas-Ramírez, E., Ziegler, J., Hempel, J., Carle, R., Irías-Mata, A., Esquivel, P., Schweiggert, R. 2015. Provitamin A carotenoids of cashew apple (*Anacardium occidentale* L.). IFT Meeting 2015, Chicago, Illinois.
34. Vargas-Ramírez, E., Ziegler, J., Hempel, J., Irías-Mata, A., Irías-Mata, A., Esquivel, P., Jiménez, V., Carle, R., Schweiggert, R. (2015). Provitamin A carotenoids of cashew apple (*Anacardium occidentale*L.)- an alternative against hidden hunger. International Congress Hidden Hunger 2015, Stuttgart, Alemania.

35. Esquivel, P (2016). Forms of carotenoid deposition in plant foods and possible implications for their bioaccessibility and bioavailability. 2nd NDSU Annual Conference on Food for Health, Fargo, North Dakota.
36. Jiménez, V.M., Hempel, J., Carle, R., Schweiggert, R.M., Esquivel, P. (2016). Peach Palm Fruit as a Source of Carotenoids for Nutritional and Health Improvement in Developing Countries. Latin Food 2016, Cancún, México.
37. Esquivel P., Schweiggert R.M., Steingass C.B., Hempel J., Chacón-Ordóñez T., Lieb V., Kerfers M.R., Vargas E., Heller A., Carle R., Jimenez V.M.. (2017). Under-utilized Latin American fruits as promissory sources of carotenoids. ICS 18th Symposium on Carotenoids. Luzern, Switzerland.

Acted as reviewer for:

Journals:

Food Research International
The Philippine Agricultural Scientist
Biologia
Journal of Food Science and Technology
Plant Foods for Human Nutrition
Interciencia
Journal of Agriculture and Food Chemistry
Food Composition and Analysis
Journal of Plant Biology
Fruits
Food Chemistry

Organizations:

Swiss National Science Foundation (SNSF)

Collaborations abroad

Reinhold Carle, Jan Frank, Thomas Hilger, Christof Steingass (Universität Hohenheim, Germany), Andreas Schieber (Universität Bonn, Germany), Antonio Meléndez (Universidad de Sevilla, España), Kalidas Shetty (North Dakota State University, USA), Coralia Osorio (Universidad Nacional de Colombia), Marcelo Paes Barros (Universidade Cruzeiro do Sul, Brazil)