

Andrés Córdova

Full time professor

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About me:

Food Engineer with motivation for research applied to the Agri-food industry, as well for the excellence in academic teaching. This is complemented with solid knowledge in food engineering, and bioprocesses applied for developing novel food ingredients. Besides, a brief stint in the food industry gave me work experience in the area of quality management, and a pragmatic vision of how to face the different professional challenges.

Currently I teach undergraduate classes for Food Engineering students, and I am a faculty member of the Doctoral Program in Agri-food Sciences in our University. I'm also Head of Outreach, and I'm in charge of the Ultrasonic Bioprocess Laboratory at the Food Engineering Department.

Areas of research interest:

- Food processing by emerging technologies
- Enzyme food processing
- Development of intensification processes by ultrasound, specifically membrane separations assisted with ultrasound, and enzyme biocatalysis assisted with ultrasound.
- Food processing sustainability and recovery of agri-food wastes
- Nutritional and quality changes during processing.

Former Work experience:

- 2017 to date: Full time professor – Pontificia Universidad Católica de Valparaíso, Chile.
- 2016: Postdoctoral position at Pontificia Universidad Católica de Valparaíso, Chile.
- 2010 -2016 : Research assistant at Pontificia Universidad Católica de Valparaíso, Chile.
- 2010 -2012 : Consultant in Quality Assurance Systems for the Food Industry, Chile.
- 2010 – 2011: Professor of Food Science, Institute of Biotechnology, Universidad Mayor, Santiago, Chile.
- 2009: Quality Assurance Assistant, Aconcagua Foods, Santiago, Chile.

Education

2008: Food Engineer – Pontificia Universidad Católica de Valparaíso, Chile.

2016: PhD. Biochemical Engineering – Pontificia Universidad Católica de Valparaíso, Chile.

2018: Diploma in Univeristy Teaching – Pontificia Universidad Católica de Valparaíso, Chile

Current Research Projects

- FONDECYT INICIACION – ANID Chilean Grant [11200054]: “Novel enzyme membrane bioreactors for the synthesis of prebiotic oligosaccharides” (2020-2023). **Main researcher /**
- FONDECYT REGULAR – ANID Chilean Grant [1211551]: “Hydrocolloid based edible coatings as strategy to produce healthier french fries options ” (2021-2024). **Co researcher**

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Annexe 1: Scientific Publications

| Year | Authors | Title and Journal | Quartil |
|------|--|---|---------|
| 2023 | Luciana Lehedé, Constanza Henríquez, Claudia Garú, Andrés Córdova, Regis Teixeira Mendonca, Oriana Salazar. | Xylan extraction from hardwoods by alkaline pretreatment for xylooligosaccharides production: a detailed fractionation analysis. <i>Carbohydrate Polymers, 302, 120381</i> | Q1 |
| 2022 | Alejandra Arancibia, Carolina Astudillo, Claudia Altamirano, Carmen Soto, Mauricio Vergara, Andrés Córdova , María Elvira Zuñiga. | Development of solid-state fermentation process of spent coffee grounds for the differentiated obtaining of chlorogenic, quinic, and caffeic acids. <i>Journal of Science of Food and Agriculture, 103, 420-427.</i> | Q1 |
| 2022 | Andrés Córdova , Paola Henríquez, Helena Nuñez, Fabián Rico-Rodríguez, Cecilia Guerrero, Carolina Astudillo, Andrés Illanes. | Recent advances in the application of enzyme processing assisted by ultrasound in agrifoods: a review. <i>Catalysts, 12 (1), 107.</i> | Q2 |
| 2020 | Carolina Astudillo, Andrés Córdova** , Vinka Oyanedel-Craver, Carmen Soto, Pedro Valencia, Paola Henríquez, Rafael Jimenez | Prediction of the Limiting Flux and Its Correlation with the Reynolds Number during the Microfiltration of Skim Milk Using an Improved Model. <i>Foods 2020, 9, 1621</i> | Q1 |
| 2020 | Carolina Henríquez, Dipayan Sarkar, Javier Molina, Silvia Sepúlveda, Andrés Córdova , Jorge Saavedra | Improving antioxidant and anti-hyperglycemic activity in cereal and apple-based food formulations using bioactive ingredients from apple peel. <i>Journal of Food Processing and Preservation, v. 2020;00:e14609</i> | Q3 |
| 2020 | Claudio Alister, Marcelo Araya, Andrés Córdova , Jorge Saavedra, Marcelo Kogan | Humic substances and their relation to pesticide sorption in eight volcanic soils. <i>Planta Daninha 2020; v38:e020171636</i> | Q4 |
| 2020 | Andrés Córdova** , Carolina Astudillo-Castro, René Ruby-Figueroa, Pedro Valencia, Carmen Soto. | Recent advances and perspectives of ultrasound assisted membrane food processing. <i>Food Research International, 133, 109163.</i> | Q1 |
| 2020 | Carlos Vera, Ceciclia Guerrero, Carla Aburto, Andrés Córdova , Andrés Illanes. | Conventional and non-conventional applications of β -galactosidases. <i>Biochimica et Biophysica Acta, 1868 (2020), 140271.</i> | Q2 |
| 2019 | Luciana Santibañez, Andrés Córdova , Carolina Astudillo, Andrés Illanes | Effect of the lactose hydrolysis on galacto-oligosaccharides mixtures subjected to nanofiltration: a detailed fractionation analysis. <i>Separation and Purification Technology 222, 342-353</i> | Q1 |
| 2019 | Andrés Córdova ** , Jorge Saavedra, Valentina Mondaca, Juan Vidal, Carolina Astudillo-Castro. | Quality assessment and multivariate calibration of 5-hydroxymethylfurfural during a concentration process for clarified apple juice. <i>Food Control 95: 106-111</i> | Q1 |
| 2018 | M.Henríquez, Verónica Loewe, Jorge Saavedra, Andrés Córdova , Mariane Lutz. | Effect of the type of packaging on the oxidative stability of pine nuts grown in Chile. <i>CyTA Journal of Food 16:(1): 255-262</i> | Q3 |
| 2017 | Jorge Saavedra, Andrés Córdova** , Rosa Navarro, Paulo Díaz-Calderón, Carolina Astudillo-Castro, Lea Toledo, Javier Enrione, Lena Gálvez. | Industrial avocado waste: Functional compounds preservation by convective drying process. <i>Journal of Food Engineering, 198:81-90.</i> | Q1 |

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| 2017 | Andrés Córdova** , Carolina Astudillo, Luciana Santibañez, Alfredo Cassano, René Ruby, Andrés Illanes | Purification of galacto-oligosaccharides (GOS) by three-stage serial nanofiltration units under critical transmembrane pressure conditions. <i>Chemical Engineering Research and Design</i> , 117: 488-499 | Q2 |
| 2016 | Carlos Vera, Andrés Córdova** , Carla Aburto, Cecilia Guerrero, Sebastián Suárez, Andrés Illanes. | Synthesis and Purification of galacto-oligosaccharides: state of art. <i>World Journal of Microbiology and Biotechnology</i> , 32:197. | Q3 |
| 2016 | Andrés Córdova** , Carolina Astudillo, Carlos Vera, Cecilia Guerrero, Andrés Illanes | Performance of an ultrafiltration membrane bioreactor (UF-MBR) as a processing strategy for the synthesis of galacto-oligosaccharides at high substrate concentrations. <i>Journal of Biotechnology</i> , 223: 26-35. | Q2 |
| 2016 | Andrés Córdova** , Carolina Astudillo, Carlos Vera, Cecilia Guerrero, Andrés Illanes | Assessment of the fouling mechanisms of an ultrafiltration membrane bioreactor during synthesis of galacto-oligosaccharides: effect of the operational variables. <i>Desalination</i> , 393: 76-89. | Q1 |
| 2016 | Andrés Córdova** , Carolina Astudillo, Lidietta Giorno, Cecilia Guerrero, Andrés Illanes, Alfredo Cassano | Nanofiltration potential for the purification of highly concentrated enzymatically produced oligosaccharides. <i>Food and Bioprocess Processing</i> , 98 :50-61 | Q2 |
| 2014 | Claudio Alister, Manuel Araya, José Morandé, Christian Volosky, Jorge Saavedra, Andrés Córdova , Marcelo Kogan | Effects of wine grape cultivar, application conditions and the winemaking process on the dissipation of six pesticides. <i>Ciencia e Investigación Agraria</i> . 41 (3): 375-386. | Scopus |
| 2014 | Carolina Henríquez, Andrés Córdova** , Sergio Almonacid, Jorge Saavedra | Kinetic modeling of phenolic compound degradation during drum-drying of apple peel by-products. <i>Journal of Food Engineering</i> . 143: 146-153. | Q1 |
| 2013 | Italo Cuneo, Eduardo Salgado, Mónica Castro, Andrés Córdova , Jorge Saavedra. | Effects of climate and anthocyanin variables on the zoning of Pinot Noir wine from the Casablanca Valley. <i>Journal of Wine Research</i> . 24 (4). | Scopus |
| 2013 | Jorge Saavedra, Andrés Córdova** , Lena Gálvez, César Quezada, Rosa Navarro. | Principal Component Analysis as an exploration tool for kinetic modeling of food quality: A case study of a dried apple cluster snack. <i>Journal of Food Engineering</i> 119: 229-235. | Q1 |
| 2013 | Carolina Henríquez, Andrés Córdova , Mariane Lutz, Jorge Saavedra. | Storage stability test of apple peel powder using two packaging materials: High-density polyethylene and metalized films of high barrier. <i>Industrial Crops and Products</i> 45: 121– 127. | Q1 |
| 2012 | Lina Yañez, Jorge Saavedra, Claudia Martínez, Andrés Córdova , María Angelica Ganga. | Chemometric Analysis for the Detection of Biogenic Amines in Chilean Cabernet Sauvignon Wines: A Comparative Study between Organic and Nonorganic Production. <i>Journal of Food Science</i> 77 (8): 143-150. | Q2 |
| 2010 | Luis Puentes, Silvio Lastreto, María José Mosqueda, Andrés Córdova , Jorge Saavedra | Influence of osmotic pretreatment on the hot air drying of Granny Smith apple. <i>Dyna (Medellín, Colombia)</i> 77 (164): 274-283. | Q4 |

BOOK CHAPTER:

Andrés Córdova, Carolina Astudillo, Andrés Illanes. (2019). Chapter 4: Membrane Technology for the Purification on Enzymatically Produced Oligosaccharides" (pp 113 – 153) en Separation of functional molecules in food by membrane technology, Ed. Charis Galanakis. Elsevier ACADEMIC PRESS, London. ISBN: 978-0-12-815056

Annexe 2: Participation in former Research Projects

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| <p>Nov 2018 – Nov 2020 ID18I10146 FONDEF</p> | <p>"Diseño, construcción y validación de un reactor prototipo UV LED a escala laboratorio para inactivación microbiana y estabilización de vinos" <u><i>Postdoc researcher</i></u></p> |
| <p>Mar 2017 – Mar 2020 3170133 FONDECYT Postdoctoral</p> | <p>"Ultrafiltration membrane bioreactors (UF-MBR) assisted by ultrasound as strategy to improve the quality of Apple juice concentrates and upgrade pomaces: process modeling under a multivariate approach". <u><i>Main researcher</i></u></p> |
| <p>Sep 2016 - 2017 15P0036 FONDEF VIU</p> | <p>"Plataforma online para el diseño de recetas para cervezas artesanales." <u><i>Assistant</i></u></p> |
| <p>Oct 2015 - Ago 2016 CORFO 15VIP 43848</p> | <p>Voucher de Innovación en PYMES : "Determinación de parámetros de operación para la extensión de vida útil de membranas poliméricas en la Nanofiltración del suero de leche, Agroindustrial Codigua SPA." <u><i>Main researcher.</i></u></p> |
| <p>Sept 2013 – Ene 2016 FONDECYT Regular 1130059</p> | <p>"Downstream processing of galacto-oligosaccharides produced by enzymatic synthesis from lactose". <u><i>Phd student.</i></u></p> |
| <p>Abril – Dic 2013 DI-Regular 037/471 VIREA PUCV</p> | <p>"Determinación y modelamiento de isotermas de sorción para la estabilidad de compuestos bioactivos antioxidantes presentes en descartes de palta Hass (piel y cuesco) para su uso como ingrediente alimentario". <u><i>Co-researcher</i></u></p> |
| <p>Nov 2011 – Jul 2013 10IEI-8284 INNOVA CORFO</p> | <p>"Nuevo producto snack natural con propiedades nutraceuticas elaborado a base de arándanos, frutillas, frambuesas y duraznos deshidratados, SURFRUT S.A". <u><i>Consulting Engineer</i></u></p> |

Annexe 3: Participation in Conferences

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| 2010, August | "VALIDATION OF HACCP QUALITY ASSURANCE SYSTEM IN A SMOKED SALMON PROCESS BY MULTIVARIATE ANALYSIS MSPC-PCA". A. Córdova, J. Saavedra, G. Torres. <i>VI Congreso Nacional de Excelencia en Gestión, Río de Janeiro.</i> |
| 2011, May | "A MALST METHOD COMPARISON OVER UNIVARIATE KINETIC MODELLING FOR DETERMINATION OF SHELF LIFE IN CEREAL SNACK OF DRIED APPLES." J.Saavedra, A.Córdova. <i>International Conference of Engineering in Foods, 11th ICEF, Atenas.</i> |
| 2013, October | "OPTIMIZACIÓN DE UN PROCESO DE SECADO CONVECTIVO, COMO ALTERNATIVA PARA LA RE-VALORIZACIÓN DE DESCARTES INDUSTRIALES DE PALTA HASS (PERSEA AMERICANA MILL)". J. Saavedra, R. Navarro, A. Córdova. <i>INNOVA 2013: Sexto Simposio Internacional de Innovación y Desarrollo de Alimentos, Laboratorio Tecnológico del Uruguay, Montevideo</i> |
| 2013, October | "ESTUDIO DE SUBPRODUCTOS DE PALTA MEDIANTE OPTIMIZACIÓN DE UN PROCESO DE ESTABILIZACIÓN DE MUESTRAS". R. Navarro, A. Córdova, J. Saavedra. <i>XIX Congreso Nacional de Ciencia y Tecnología de Alimentos: Innovación y seguridad, claves para el desarrollo de alimentos saludables. Sociedad Chilena de Tecnología de Alimentos y Universidad de Antofagasta, Antofagasta 2013.</i> |
| 2014, July | "ASSESSING THE VOLUMETRIC PRODUCTIVITY OF AN ULTRAFILTRATION MEMBRANE BIOREACTOR DURING THE SYNTHESIS OF GALACTO-OLIGOSACCHARIDES". A.Córdova, C. Astudillo, C. Guerrero, A. Illanes. <i>European Conference on Biotechnology, Edimburgo, Escocia</i> (Proceeding in New Biotechnology, S116-117, 2014). |
| 2014, September | "OPTIMIZING THE FLUX OF AN ULTRAFILTRATION MEMBRANE BIOREACTOR FOR THE SYNTHESIS OF GALACTO-OLIGOSACCHARIDES". A. Córdova, C. Astudillo, C. Guerrero, A. Illanes. <i>7th Whey Conference, Rotterdam, Holanda.</i> |
| 2014, November | "EFFECT OF TEMPERATURE AND CROSS-FLOW VELOCITY ON FLUX DURING THE SYNTHESIS OF GALACTOOLIGOSACCHARIDES IN AN ULTRAFILTRATION MEMBRANE BIOREACTOR". A. Córdova, C. Astudillo, C. Guerrero, A. Illanes. <i>2nd International Conference of Food Technology, Kusadasi, Turquía.</i> |
| 2015, July | "DEHYDRATED APPLE PEEL AS SOURCE OF PHENOLIC COMPOUNDS AND DIETARY FIBER AND IN VITRO BIOACTIVITY LINKED TO HYPERGLICEMIA MANAGEMENT". C. Henríquez, M, Lutz, J. Molina, A. Córdova, J. Saavedra, D. Sarkar, K. Shetty. <i>1st NDSU Annual Conference on Food for Health. Fargo, North Dakota, Estados Unidos.</i> |
| 2015, July | "FLUX DECAY MODELLING IN AN ULTRAFILTRATION MEMBRANE BIOREACTOR, DURING THE SYNTHESIS OF GALACTO-OLIGOSACCHARIDES." A. Córdova, C. Astudillo, C. Vera, C. Guerrero, A. Illanes. <i>Conference on Chemical and Biochemical Engineering, Paris, Francia.</i> |
| 2015, August | "DETERMINATION OF THE CRITICAL AND LIMITING FLUX IN NANOFILTRATION OF GALACTO-OLIGOSACCHARIDES BY A NOVEL EXPONENTIAL MODEL: EFFECT OF SOLUTE CONCENTRATION". A. Córdova; C. Astudillo; A. Cassano; C. Conidi; L. Giorno; C. Guerrero; A. Illanes. <i>Euromembrane Conference, Ahen, Alemania.</i> |
| 2015, October | "FORMULACION DE ALIMENTOS UTILIZANDO COMO INGREDIENTE CÁSCARA DE MANZANA DESHIDRATADA EN POLVO". C. Henríquez, J. Molina, S. Sepúlveda, A. Córdova, J. Saavedra, K. Álvarez, M. Lutz. <i>7^o Simposio Internacional de Innovación y Desarrollo de Alimentos, INNOVA-CIBIA, Montevideo, Uruguay.</i> |
| 2016, November | "DESARROLLO DE PRODUCTOS CON ADICIÓN DE AZÚCAR Y SUS EQUIVALENTES CON EDULCORANTES A BASE DE DURAZNOS MORADOS". <i>2^o Congreso Iberoamericano de Ingeniería de los Alimentos,</i> |

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| | <i>Punta del Este, Uruguay.</i> |
| 2017, October | "PREDICCIÓN DE 5-HIDROXIMETILFURFURAL (HMF) DURANTE UN PROCESO DE CONCETRACIÓN DE JUGO DE MANZANA CLARIFICADO MEDIANTE MÉTODOS DE PROYECCIONES LATENTES". Mondaca, V, Córdova A, Saavedra, J, Vidal, J, Ulloa, P. 8vo Simposio Internacional de Innovación y Desarrollo de Alimentos , Montevideo, Uruguay. |
| 2019, October | "EFECTO DE LAS CONDICIONES OPERACIONALES PARA LA REVALORIZACION DE POMASA MEDIANTE ULTRASONIDO". Andrés Córdova, Carolina Astudillo, Carmen Soto, Alejandra Arancibia, Edison Salazar, Vinka Carrasco, Juan Vidal. 9º Simposio Internacional de Innovación y Desarrollo de Alimentos INNOVA, Montevideo, Uruguay |
| 2019, November | "EXTRACTION OF CHLOROGENIC ACID FROM SPENT GROUND COFFEE BY SOLID STATE FERMENTATION". A. Arancibia-Diaz, C.Astudillo-Castro, C.Altamirano, A. Córdova, C. Soto-Maldonado, M.E. Zuñiga. 33rd EFFoST International Conference: Sustainable Food Systems, Rotterdam, Holanda. |
| 2019, November | "RECOVERY OF PHENOLIC COMPOUNDS FROM APPLE POMACE BY ULTRASOUND. PROCESS CONDITIONS AND GREENNES EVALUATION". A. Córdova, C. Astudillo, C.Soto, A. Arancibia, E. Salazar, V. Carrasco, J. Vidal. 33rd EFFoST International Conference: Sustainable Food Systems, Rotterdam, Holanda. |
| 2022, Julio. | "SNACK DE MANZANA DESHIDRATADO CON IMPREGNACION A VACÍO DE PROBIÓTICOS I. PARACASEI". N. Contreras, C. Ramirez, K. Belmonte, R. Simpson, A. Córdova, H. Nuñez. CIBIA XII, Congreso Iberoamericano de Ingeniería de Alimentos, Colombia. |