

# Cristina D. Cruz

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## Objective

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Throughout my career, I have taken on diverse challenges and proven my ability to deliver positive results. As a molecular microbiologist I have produced, developed, and achieved meaningful scientific outcomes towards public health.

My career goal is to translate the skills and knowledge I have acquired from my own research in Food Safety into science-driven future looking of Health and Wellness.

As part of my continuing education I am currently taking a course on Food Safety and Quality: ISO 9001, ISO 19011, ISO 22000, BRC e IFS v.6

## Experience

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- 2017** Post-doctoral research scientist  
(University of Helsinki)
- 2010 – 2016** Molecular microbiologist  
(The New Zealand Institute for Plant & Food Research Limited)
- 2008 – 2009** Post-doctoral research scientist  
(New Zealand Institute for Crop & Food Research Limited)

## Education

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- 2007** PhD, Food Science, University of Sao Paulo, Brazil
- 2003** Msc, Food Science, University of Sao Paulo, Brazil
- 2000** Bsc, Biomedical Sciences, University of Sao Paulo, Brazil

## Skills

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- 1) Understanding foodborne pathogen ecology, particularly:
  - Diversity and virulence of *Listeria monocytogenes* in Greenshell mussels and processing factories
  - Prevalence and pathogenicity of *Vibrio parahaemolyticus*, *V. vulnificus* and *V. cholerae* in Pacific oysters and Greenshell mussels.
  - Enumeration, prevalence and diversity of foodborne pathogens (*L. monocytogenes*, pathogenic *Escherichia coli* and *Salmonella* spp in fruits: apples and kiwis.
- 2) Implementing methods used for management and control, including:
  - Pulsed Field Gel Electrophoresis for typing, multiplex PCR for serotyping and qPCR for 24h bacterial detection and enumeration.
  - Development of methodology to rapidly assess the efficacy of commercial sanitizers and cleaners.
  - Evaluation of commercially available rapid kits.



- Application of high-pressure processing, heat, natural antimicrobial compounds, and freezing to improve food safety.
- 3) Managing a physical containment class II facility:
- Increase capability of laboratory with purchase of equipment.
  - Collaborate with preparation for external government inspections.
  - Assure smooth work and manage of technical staff.
  - Technical training of personnel.
  - Review reports and publications derived from project.
- 4) Supervising and elaborating projects for undergraduate and postgraduate students:
- PhD:
    - Identification and understanding the roles of biofilm formation-related genes in *Listeria monocytogenes*.
    - A study of natural lytic *Listeria* phages with decontaminating properties for use in seafood processing plant.
- 5) Contribution on writing multi-objective project of successful funding proposal:
- Seafood Safety (€250 for 7 years).
  - Understanding *Listeria* persistence in seafood premises (€50 for 1 year).
  - UV and heat treatment on Food Safety of fresh produces (€100 for 5 years).

## Languages

- Portuguese: Native
- English: Fluent (IELTS 8.0)
- Spanish: Intermediate (DELE B2)
- French: Beginner (DELF B1)

## Achievements

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### Industry impact

We have provided new insights on ecology and prevalence of *Listeria monocytogenes*: identification of contamination routes and patterns in 3 major seafood processing lines in New Zealand. We have advised, discussed and suggested ways on how to minimize risk and consequent financial loss. The integration between my research knowledge and industry experience has led to a reduction in processing environment contamination and consequent decrease in rejected products.

Our research also showed that monitoring of pathogenic *Vibrio* sp and seawater temperature is needed for those producers who harvest and export oysters over the summer season in New Zealand. I was involved in the discussions with government members and oyster industry representatives to contribute towards final decisions of the monitoring program, as well as on a possible continuous research on post-harvest methods that could be used by the industry.

For the fresh produce sector, we provided evidence that soil and water are possible sources of contamination as well as bags and gloves used for picking fruits. We also informed the industry about possible mitigation steps to be taken: e.g. cold storage may reduce the incidence of *Listeria* and *E. coli* in fruit and finishing sprays (current in use by industry for quality purposes) may be able to reduce the incidence of *L. monocytogenes*.



## Relevant Publications

- Stollewerk K\*, **Cruz CD\***, Fletcher GC, Garriga M, Jofre A 2016. The effect of mild preservation treatments on the invasiveness of different *Listeria monocytogenes* strains on Greenshell™ mussels. Food Control.
- Petri Widsten P, **Cruz CD**, Fletcher GC, Pajak MA 2016. Inhibition of foodborne bacteria by antibacterial coatings printed onto food packaging films. Journal of Food Science.
- **Cruz CD**, Chycka M, Hedderley D, Fletcher GC 2016. Prevalence, characteristics, and ecology of *Vibrio vulnificus* found in New Zealand shellfish. Journal of Applied Microbiology. 120 (4): 1100-1107.
- **Cruz CD**, Hedderly D, Fletcher GC 2015. *Vibrio parahaemolyticus* prevalence and distribution in New Zealand shellfish: A long-term study. Applied & Environmental Microbiology.
- Petri Widsten P, **Cruz CD**, Fletcher GC, Pajak MA, McGhie TK 2014. Tannins and extracts of fruit byproducts: antibacterial activity against foodborne bacteria and antioxidant capacity. Journal of Agricultural and Food Chemistry 62(46): 11146–11156.
- **Cruz CD**, Pitman A, Harrow S, Fletcher GC 2014. Attenuated invasiveness of identical Sequence Types of *Listeria monocytogenes* associated with New Zealand seafood production and clinical cases encoding a truncated InlA. Applied and Environmental Microbiology 80(4): 1489–1496.
- Ganegama Arachchi GJ, Cridge AG, Dias-Wanigasekera BM, **Cruz CD**, McIntyre L, Liu R, Flint SH, Mutukumira AN 2013. Effectiveness of phages in the decontamination of *Listeria monocytogenes* adhered to clean stainless steel, stainless steel coated with fish protein, and as a biofilm. Journal of industrial microbiology & biotechnology 40 (10): 1105-1116.
- Mutukumira, AN, **Cruz, CD**, Fletcher GC 2012. Supply of Safe Food. In: Wardlaw G M, Smith A M (editors). Contemporary Nutrition, 9<sup>th</sup> Edition. McGraw-Hill, New York.
- **Cruz CD**, Fletcher GC 2012. Assessing manufacturers' recommended concentrations of commercial sanitizers on inactivation of *Listeria monocytogenes*. Food Control 26(1): 194-199.
- **Cruz CD**, Win, JR, Chantarachoti J, Mutukumira AN, Fletcher GC 2011. Comparing rapid methods for detecting *Listeria* in seafood and environmental samples using the most probably number (MPN) technique. International Journal of Food Microbiology 153(3): 483–487.
- **Cruz CD**, Fletcher GC 2011. Prevalence and biofilm-forming ability of *Listeria monocytogenes* in New Zealand mussel (*Perna canaliculus*) processing plants. Food Microbiology 28(7): 1387–1393.

## Hobbies and Interests

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During my spare time I enjoy watching movies and going out with family and friends. I also enjoy cooking (mainly desserts), listening to music and biking. In winter I usually enjoy myself crafting projects (sew, knitting, cross-stich) and puzzles.