



Carla Pruzzo

Adjunct professor

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Education and training

1974

First class degree in Biological Sciences. Degree thesis on Microbiology

Science Faculty University of Genova - Genova - IT

Academic experience

2004 - ONGOING

Full Professor of Microbiology School of Sciences

University of Genova - Genova - IT

1990 - 2004

Full Professor of Microbiology Medical Faculty

Marche Polytechnic University - Ancona - IT

1987 - 1990

Associate Professor of Microbiology Faculty of Pharmacy and Faculty of Sciences

University of Genova - Genova - IT

1974 - 1987

Assistant Professor Microbiology

Medical Faculty - University of Genova - IT

Research interests

The research activity carried out by Carla Pruzzo is focused on the study of the interactions between bacteria and living and non-living substrates, thus developing in an area covering different areas of Microbiology. After the first studies on a particular phenomenon of lysogenic conversion involved in alterations of bacterial morphology and surface antigens, her research activity concerned the study of bacterial structures that mediate the adhesion of pathogenic bacteria to host surfaces, with the aim of developing new anti-infective approaches based on the inhibition of initial interactions between bacteria and host. Subsequently, her research activity, while not abandoning the previous areas of interest, has extended to the study of survival strategies of pathogenic and non-pathogenic bacteria in the waters with particular attention to the analysis of bacterial interactions with biotic and abiotic surfaces that favor their persistence in the water.

An important aspect of the conducted studies concerned and still concerns GbpA protein of *Vibrio cholerae*, present on the outer membrane of the bacterium and secreted in the medium. GbpA is involved in the colonization of human intestinal cells and environmental surfaces containing chitin by specifically binding residues of N-acetylglucosamine (the chitin-forming sugar also present on human intestinal cell membranes). For this dual role, in humans and the oceans, GbpA could represent a sort of link between the life of the microorganism in the aquatic environment and in humans. GbpA gene (containing a highly conserved region in *V. cholerae* species) was also used as a new phylogenetic marker for the development of molecular protocols for pathogen identification in complex environmental and clinical samples.

Another aspect of her research activity concerned and concerns the role of vibrios in mass mortality events of bivalve molluscs. The results of this activity have led to the clarification of the aquatic ecology of *Vibrio aestuarianus* and *Vibrio tasmaniensis*, important pathogens of oysters. In addition, her studies have shown that a serum opsonin (MgEP) is able to mediate and enhance the adhesion to and killing by *Mytilus galloprovincialis* hemocytes of bacteria that express mannose-sensitive ligands (MSHA of *V. aestuarianus* 01/032 and *V. cholerae*, type fimbriae I of *Escherichia coli*). An interesting aspect of the research was the demonstration that MgEP (not present in oysters) makes *Crassostrea gigas* hemocytes capable of kill *V. aestuarianus* with the same efficiency as mussel phagocytes. These data suggest that the increased sensitivity to infections of oysters in comparison to mussels may depend, at least in part, on the presence in the latter of the MgEP.

Recent studies have focused on the analysis of the effects of global warming on the ecology of *Vibrio* spp. The conducted studies have shown that over the past 50 years, water warming contributed to the spread of vibrios pathogenic for humans in the coastal waters of the North Sea and North Atlantic and the onset of associated diseases.

Research Support

Carla Pruzzo has been awarded national and international grants from: Italian Ministry of Health, Italian Ministry of University and Research, Italian Ministry of Foreign Affairs, NATO, European Community

Most recent European Community grants:

- 5th EU FP "Antimicrobial Resistance Transfer From and Between Gram-Positive Bacteria of the Digestive Tract and Consequences for Virulence" (ARTRADI), Coordinator: Anne Collignon, QLK2-CT-2002-008439. Period 2002-2005. Team leader
- 6th EU FP "Towards functional foods for oral health care - isolation, identification and evaluation of beverage and food components with anti-caries and/or anti-gingivitis activities" (Nutrident) 036210. Period 2006- 2010. Team leader
- 7th EU FP "Management of infectious diseases in oysters and mussels in Europe" (BIVALIFE). 2011-2014. Team leader
- 7th EU FP "Protecting the health of Europeans by improving methods for the detection of pathogens in drinking water and water used in

- food preparation” (Aquavalens). 2013-2017. Team leader (2013-2015)
- Horizon 2020 “Preventing and mitigating farmed bivalve diseases” (VIVALDI). 2016-ongoing Team leader

Publications:

- more than 110 full papers in International Journals
- more than 10 full papers in International Books.
- two patents

Citation overview (July 2018) (SCOPUS):

n cited documents: 113

h index: 35

citations: 2972