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► **To cite this version:**

Javier Pizarro-Cerdá. Pascale Cossart: *Listeria monocytogenes*, host-pathogens interactions & beyond. Cellular Microbiology, Wiley, 2020, 22 (4), pp.e13165. 10.1111/cmi.13165 . pasteur-02735349

**HAL Id: pasteur-02735349**

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Submitted on 2 Jun 2020

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# **Pascale Cossart: *Listeria monocytogenes*, host-pathogens interactions & beyond**

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I met Pascale Cossart for the first time in Paris in May 1998, on my way to the 'General Meeting' of the American Society for Microbiology in Atlanta (presided over that year by Stanley Falkow). While concluding a Ph.D. investigating the intracellular life of the bacterial pathogen *Brucella abortus* with Jean-Pierre Gorvel in Marseilles (Pizarro-Cerdá *et al.*, 1998a, 1998b, Sola-Landa *et al.*, 1998), I was determined to pursue my career in the field of host-pathogen interactions. I was interested in joining an environment combining strong expertise in both mammalian and bacterial biology, and Pascale's laboratory working on cellular infection by *Listeria monocytogenes* was truly outstanding in that respect: at the time she had already identified ActA as the molecule required for the actin-based motility of *L. monocytogenes* (Kocks *et al.*, 1992), she had also identified internalins as key surface molecules of *L. monocytogenes* triggering bacterial internalization in epithelial cells (Gaillard *et al.*, 1991). She had also characterized E-cadherin as the cellular receptor for InlA (Mengaud *et al.*, 1996), and her team was deciphering the signaling cascades activated by InlB that favored bacterial engulfment (Ireton *et al.*, 1996). Her article 'Cellular Microbiology Emerging' (Cossart *et al.*, 1996) had precisely set the grounds for a new discipline (and a new journal) dedicated to explore in detail the molecular interactions between microbial pathogens and eukaryotic cells. My first encounter with Pascale convinced me right away to join her lab: I met a very warm person, full of enthusiasm and energy, with whom we passionately discussed the best ways to combine the interests and questions of her lab with technological tools I had used and applied during my Ph.D. We met again later in August 1998 in the Greek island of Spetses at the EMBO-FEBS Course 'Molecular Basis of Bacterial Infection' (organized then by Marianne Gruenberg-Manago, and subsequently organized between 2002 and 2019 by Pascale herself and Roberto Kolter) to discuss implementation of the project I was going to develop in her lab (the proteomic and phosphoinositide analysis of the *L. monocytogenes* internalization vacuoles in epithelial cells). Pascale provided me full support to write an application for a national call from the French Ministry of Research that soon was going to result in my first research grant.

When I joined Pascale's laboratory in March 1999, I didn't know that I was going to work with her for the next 19 years and that we were going to co-author 50 papers! This has been a

tremendously exciting period. In collaboration with Jérôme Garin, we identified septins as novel cytoskeletal components recruited by *L. monocytogenes* at bacterial entry sites (Pizarro-Cerdá *et al.* 2002), and subsequently with Serge Mostowy we investigated how different members of the septin family differentially affected bacterial internalization (Mostowy *et al.*, 2009, 2011). In collaboration with Bernard Payrastre, we also studied the production of phosphoinositides at the surface of the *L. monocytogenes* internalization vacuoles, and we highlighted the function of a type II PI 4-kinase in a signaling cascade different from the previously identified pathway involving the class I PI 3-kinase (Pizarro-Cerdá *et al.* 2007). However overall, it has been particularly impressive to witness Pascale's force and capacity to tackle major questions in the field, taking advantage of a most extraordinary array of technological developments and approaches: she has pioneered the use of comparative genomics to identify novel *L. monocytogenes* virulence factors (Archambaud *et al.*, 2005; Cabanes *et al.*, 2004; Dussurget *et al.*, 2002; Glaser *et al.*, 2001), she has developed transgenic mice to investigate in a physiological context the traversal of the intestinal barrier by *L. monocytogenes* (Lecuit *et al.*, 2001), she has performed global transcriptomic studies to understand the molecular landscapes that characterize the transition of *L. monocytogenes* from saprophytism to virulence (Toledo-Arana *et al.*, 2009), she has implemented systematic analyses of post-translational modifications of host molecules during infection (Radoshevich *et al.*, 2015; Ribet *et al.*, 2010), and she has pioneered the investigation of host receptor activation/internalization (Bonazzi *et al.*, 2007; Lecuit *et al.*, 1999; Seveau *et al.*, 2004; Sousa *et al.*, 2007; Veiga *et al.*, 2007), cytoskeletal rearrangements (Bierne *et al.*, 2001), chromatin remodeling (Hamon *et al.*, 2007) and organelle manipulation (Stavru *et al.*, 2011) during infection by bacterial pathogens. With Pascale's support, we have also applied genome-wide small-interfering RNA silencing to identify novel host cell signaling cascades modulating *L. monocytogenes* infection positively or negatively (Kühbacher *et al.*, 2015), as well as metabolomic approaches to reveal the modulation of the host microbiota by the first bacteriocin described for *L. monocytogenes* (Quereda *et al.*, 2016).

It is important to mention that Pascale is not only an outstanding investigator, she has also critically impacted her scientific environment in many different ways. She has been a major promotor of scientific exchanges and through her partnerships with Institut Pasteur, EMBO, FEBS and other organizations, she has orchestrated numerous international courses, meetings, congresses and workshops that have benefited multiple scientists in diverse fields that expand beyond the frontiers of infection biology. Pascale has always supported young researchers and particularly women in science, and with the French Academy of Sciences she has developed programs to recognize the achievements and contributions of young Ph.D. students and post-docs. Pascale's work and dedication to science have been recognized through the award of more than 40 prizes, including major distinctions such as the Robert Koch Prize, the Balzan Prize or the Louis Jeantet Prize. She is also a member of major Academies around the globe including the Académie des Sciences

(France), the Royal Society (UK), the Leopoldina (Germany), the European Academy of Microbiology (EU) and the American National Academy of Sciences (USA).

This special issue of Cellular Microbiology is a tribute to Pascale's numerous achievements and scientific contributions throughout her career. It gathers a collection of articles from colleagues, collaborators or former members of the Cossart Lab that present state-of-the-art snapshots of model pathogens and model systems, illustrating key advances in the field of Cellular Microbiology, providing exciting perspectives for the coming years.

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