P3-21 Comparative Proteomic Analysis of Salmonella enterica serovar Enteritidis PT4 Planktonic and Sessile Cells on Stainless Steel Surface Provides New Insights in Protein Determinants Involved in the Maintenance of a Biofilm community

Efstathios Giaouris, University of Aegean, Lemnos, Greece, **Nikos Chorianopoulos**, Greek Agricultural Organization Demeter, Athens, Greece, **Danilo Ercolini**, Universita degli Studi di Napoli Federico II, Naples, Italy and **GEORGE NYCHAS**, Agricultural University of Athens, Athens, Greece

Introduction: Numerous studies with various microorganisms have demonstrated that biofilm formation triggers the expression of specific sets of proteins, compared to planktonic cells. However, nothing is yet known about the proteomic profile inside a *Salmonella* biofilm formed on stainless steel (SS), an abiotic substratum commonly used in food processing equipment.

Purpose: In order to better understand the cellular mechanisms sustaining a surface-associated lifestyle of *S.* Enteritidis in food related environments, the differential protein patterns of this bacterium cultivated as biofilm on SS versus planktonic mode were comparatively studied in the present work.

Methods: By using 2-D PAGE in combination with MALDI-TOF MS analysis, 30 proteins were identified as differentially expressed between the two growth modes on an "on-off" basis, that is, proteins that were detected in one case but not in the other. ***Results:*** In particular, 20 proteins were identified solely expressed in biofilm cells, of which half (10 out of 20) have also been found to be implicated in biofilm formation and / or other related events in other bacteria (ArcA, Dps, TrxA, Crr, DppA, GpmA, RibB, SseA, Ssb and MipA). Biofilm related proteins were mainly related to global regulation and stress response, nutrient transport, degradation and energy metabolism.

Significance: Present results clearly show that under surface-associated growth *Salmonella* over-produces proteins mainly related to stress management, supporting the well established view that biofilms are examples of multicellular behavior which enhance the capacity of microorganisms to survive multiple stresses Unambiguously, the ability to recognize "how and why" *Salmonella* attach to food-contact surfaces and form biofilms on them is an important area of focus, since a better understanding of this ability may provide valuable ways towards the elimination of this pathogenic bacterium from food processing environments and eventually lead to reduced *Salmonella*-associated human illness. The action THALIS: "Biological Investigation Of the Forces that Influence the Life of pathogens having as Mission to Survive in various Lifestyles; BIOFILMS", has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) - Research Funding Program: THALES. Investing in knowledge society through the European Social Fund.