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Sommario/riassunto

The Overview of the Topic was the following: “One of the most active areas of research in molecular microbiology has been the study of how bacteria modulate their genetic activity and its consequences. The prokaryotic world has received much interest not only because the resulting phenomena are important to cells, but also because many of the effects often can be readily measured. Contributing to the interest of the present topic is the fact that modulation of gene activity involves the sensing of intra- and inter-cellular conditions, DNA binding and DNA dynamics, and interaction with the replication/transcription machinery of the cell. All of these processes are fundamental to the operation of a genetic entity and condition their lifestyle. Further, the discoveries achieved in the bacterial world have been of ample use in eukaryotes. In addition to the fundamental interest of understanding modulation of prokaryotic lifestyle by DNA-binding proteins, there is an added interest from the healthcare point of view. As it is well known the antibiotic-resistance strains of pathogenic bacteria are a major world problem, so that there is an urgent need of innovative technologies to tackle it. Most of the acquired resistances are spread by processes of horizontal gene transfer mediated by mobile elements in which DNA replication and gene expression are of basic interest. There is an imperative of finding new alternatives to the ‘classical’ way of treatment of bacterial infections and these new alternatives include the discovery of new drugs and of new bacterial targets. Nevertheless,

these new alternatives will find a dead-end if we are unable to obtain a better understanding of the basic processes modulating bacterial gene expression. Our goal to achieve with this Topic of Frontiers is to accelerate our understanding of protein-DNA interactions. First, the topic will bring together several very active researchers in the study of gene replication, gene regulation, the strategies applied by the different proteins that participate in these processes, and their consequences. We will also acquire an in-depth knowledge of some of the mechanisms of gene regulation, gene transfer and gene replication. Further, the readers of the papers will realize the importance of the topic and will learn the most recent thinking, results, and approaches in the area". We are fully confident that we have exceeded our expectations. Now we are proud to present the final output of the Topic, which is the eBook. It includes 24 articles contributed by 118 authors. As of today, Monday, 16th, January 2017, the total number of readings has reached 19,284, 14,921 article views, and 2,944 article downloads.