

Tentative Outline
Special Issue for Current Medicinal Chemistry
Guest Editor: Rita Berisio

Title: Molecular Determinants of Bacterial Diseases

Aims & Scope:

This thematic issue includes articles addressing a multi-disciplinary approach to the understanding of molecular events involved in bacterial infections. An effort is made to bring together researchers from different countries (from seven to ten countries are currently foreseen) and to merge complementary approaches, which range from biophysics and biochemistry to microbiology and animal models.

Host recognition of bacterial pathogens is based on the detection of conserved products of microbial metabolism on the bacterial cell surface. Lipopolysaccharides, lipoproteins, peptidoglycan and lipoteichoic acids are all unique molecules synthesized by bacteria but not eukaryotic cells. These products, denominated Pathogen Associated Molecular Patterns (PAMPs), are considered as the key molecular signatures of microbial invaders by the innate immune system and their recognition signals the presence of infection. Thus, the outer membrane/cell wall of bacteria bears molecules that elicit host immune responses through a variety of pathogen receptors, each with potential for distinct intracellular signalling, although our knowledge in this field is still largely incomplete.

In this Issue, different molecular events associated to bacterial infections are discussed as an opportunity to develop molecular entities of therapeutic interest. The Issue will start with the description of key molecular events associated with pathogenesis, by experts in the field. Key topics will include bacterial adhesion to their hosts, immune reaction to bacterial PAMPs, molecular basis of recognition of PAMPs by host receptors and bacterial defence mechanisms against their hosts, like dormancy or biofilm formation. These topics will be discussed as an opportunity to combat bacterial diseases through either vaccine or drug development.

Keywords:

Immunoproteomics, Ureases, Peptidoglycan degrading enzymes, *Pseudomonas aeruginosa*, Bacterial UDP- glucose pyrophosphorylase

Subtopics:

1. Application of immunoproteomics to discover novel vaccine antigens.
2. Structure and function of bacterial UDP-glucose pyrophosphorylase, a drug target candidate.
3. The critical role of ureases in bacterial diseases.
4. Peptidoglycan degrading enzymes in bacterial cell growth and division.
5. Therapeutic inhibitors from TIR domain containing proteins.
6. Alternative therapeutic approach against *Pseudomonas aeruginosa*.
7. Bacteriophages and phage-derived proteins – Application approaches.
8. Secretion Systems in bacterial pathogens.
9. The contribution of virtual screening to anti-bacterial drug development.
10. Structural basis of biofilm formation in bacteria.
11. Use of computational approaches to tackle biological problems. Surpassing experimental limits.
12. Bacterial communication to spread resistance.

Schedule:

Manuscript submission deadline: July, 2014

Revision Due: September, 2014

Notification of acceptance by the Guest Editor: September, 2014

Final manuscripts due: October, 2014