

## Exploring the diversity of protein modifications: special bacterial phosphorylation systems - DTU Orbit (09/11/2017)

### Exploring the diversity of protein modifications: special bacterial phosphorylation systems

Protein modifications not only affect protein homeostasis but can also establish new cellular protein functions and are important components of complex cellular signal sensing and transduction networks. Among these post-translational modifications, protein phosphorylation represents the one that has been most thoroughly investigated. Unlike in eukarya, a large diversity of enzyme families has been shown to phosphorylate and dephosphorylate proteins on various amino acids with different chemical properties in bacteria. In this review, after a brief overview of the known bacterial phosphorylation systems, we focus on more recently discovered and less widely known kinases and phosphatases. Namely, we describe in detail tyrosine- and arginine-phosphorylation together with some examples of unusual serine-phosphorylation systems and discuss their potential role and function in bacterial physiology, and regulatory networks. Investigating these unusual bacterial kinase and phosphatases is not only important to understand their role in bacterial physiology but will help to generally understand the full potential and evolution of protein phosphorylation for signal transduction, protein modification and homeostasis in all cellular life.

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Authors: Mijakovic, I. (Intern), Grangeasse, C. (Ekstern), Turgay, K. (Ekstern)

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