Call: 7th Call - 2018 Network Call on Surveillance

Title: Surveillance Of mobiLome meDiated aNtibiotic rEsiStance Spread

Acronym: SOLIDNESS

Network composition

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Partner	João A. Carriço	Universidade de Lisboa	Portugal
Partner	Mirko Rossi	University of Helsinki	Finland
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Partner	Edward Feil	University of Bath	UK
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Abstract

Mobile genetic elements (MGEs) are DNA molecules that often carry important genes for the fitness of microorganisms, such as resistance and virulence genes, which may confer an adaptive advantage to recipient bacteria. Hence, they play a pivotal role in horizontal gene transfer. MGEs are one of the main players in antibiotic resistance dissemination and can be shared by different bacterial strains, species or even genera, which makes them one of the biggest concerns to healthcare stakeholders. MGEs are challenging to characterise through sequencing, due to their chimeric, modular and repetitive nature. Our main objective is to establish a network of excellence for surveillance of MGE-mediated antibiotic resistance spread. This network will improve the access to high-quality and curated MGEs sequencing data that will be shared at the international level. It will result in the production of documents (standard operating procedures, SOPs) by the network detailing 1) harmonisation of high-

quality sequencing standards and protocols for MGEs detection; 2) definition of a bioinformatics workflow for MGEs sequence analysis from next-generation sequencing data; 3) definition of new sequence-based typing methods of plasmids for both Gram-positive and Gram-negative bacteria.

Since the network includes a wide range of stakeholders with diverse expertise, including expertise in classical typing methods, "-omics", bioinformatics and plasmid-detection, the combination of backgrounds will contribute to the creation of the high-quality and curated MGEs database from different sources. This proposal aims to track the evolution and spread of antimicrobial resistance and virulence in bacteria, mediated by MGEs, and in the future, find ways to prevent it.