

ACRONYM: MACOTRA**Title: Combating MRSA; increasing our understanding of transmission success will lead to better control of MRSA****Keywords: MRSA, transmission, genomics, survival, colonisation, microbiome, mathematical modelling****Consortium composition:**

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Abstract:

The primary aims of the MACOTRA project are three-fold 1. To develop and provide a framework for evaluating differences in transmission of MRSA. 2. To unravel the different contributions to MRSA clonal success on a genetic and population level. 3. To develop a mathematical model which predicts and unravels the rise and shine of clones. Study material will be epidemiologically well-defined isolates from international collections, and microbiomes from patients. Study questions are from the bacterial point of view;

- To delineate factors for unsuccessful and successful (epidemic) clonal MRSA, from both livestock and human isolates from the Netherlands, UK and France

From the human point of view;

- To study the role of MRSA carriage in relation to microbiome of nose and skin.

From the interaction between the host and bacteria

- To develop in-vitro models to study differences in strain survival and transmission in the host and in response to decolonisation, antibiotics, disinfectants and microbiome. Skin, plasma and microbiome models will be used.
- To develop deterministic and individual-based mathematical models of bacterial dynamics, including survival, within human hosts, as well as on transmission dynamics between human hosts. MACOTRA study results and data from decolonisation and other intervention strategies, risk groups and antibiotic/disinfectants usage in the Netherlands, UK and France will serve as input to the mathematical models.

The consortium exists of (molecular) microbiologists, medical doctors and mathematical modellers, all very successful and well-known in the MRSA and / or infectious disease field; from basic research to clinical (intervention) studies.