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1. Context and objectives

In MARILIA, we planned the development of horseradish peroxidase (HRP)-DNA barcoded components and conjugating them to bacteria-binding proteins (BBP), aiming toward selective targeting of particular pathogens in water. In parallel, a methodology for peptide (for instance BBP) – DNA conjugates had to be developed.

Thus, we had to optimize the DNA methodology on a simple peptide-DNA conjugate level, to have a good starting point for HRP-DNA tethering, as well as BBP-DNA conjugates with retained antibacterial activity and selectivity.

There are several strategies for the covalent connection of peptides and/or proteins to DNA oligonucleotides. The two most attractive amino acid residues available for modification are cysteine and lysine because of their high reactivity.

Therefore, we investigated:

2.1. Modification of peptide thiolo groups (cysteine residues)

2.2. Modification of peptide amino groups (lysine residues and/or N-terminus)