Title: **Synthesis of vimentin derived citrullinated peptide and study of peptide-peptide interaction by fluorescence**

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The HLA-DRB1*0401 allele of HLA-DR (Human Leukocyte Antigen - DR isotype), a cell surface receptor present in macrophages or dendritic cells is expressed in people affected by rheumatoid arthritis, an autoimmune disease which affects the joints. Here, model peptides were synthesized to be used for determining if a previously described interaction between citrullinated proteins and HLA-DR protein could be studied by FRET.

The three following peptides were synthesized: $^{(AA,BB,CC)}$Cit [XX-XX] Vimentin, a fragment of Vimentin, a protein present in our organism, with several citrullinated residues; [XX-XX] Vimentin, the non-citrullinated vimentin variant, to be used as a control peptide; and [YY-YY] HLA-DR, the full α-helix of β-chain of HLA-DR protein containing an epitope with high affinity for citrullinated peptides called Shared Epitope. In order to carry out FRET experiments, vimentin derived peptides were labeled with 5(6)-Carboxyfluorescein, the donor fluorophore, and [YY-YY] HLA-DR was labeled with 5(6)-Carboxy-tetramethyl-rhodamine, the acceptor fluorophore.

FRET experiments showed that energy transfer between fluorophores could not be observed under a wide range of temperatures and pH values. It was concluded that whether the peptides were not appropriate or the FRET experiment conditions were not adequate to model the interaction between citrullinated proteins and HLA-DR.