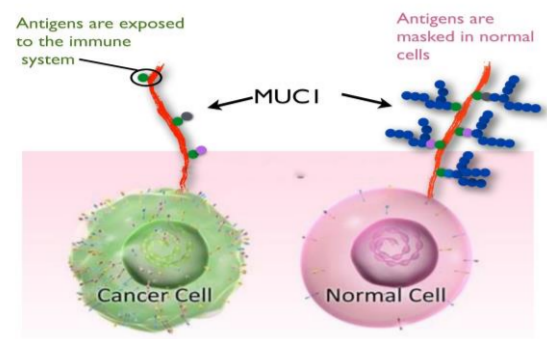
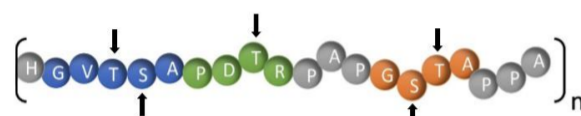


Mucin-1; a promising cancer antigen



Mucins are large extracellular glycoproteins met with different post-translational modifications in healthy and cancer cells.^[1,2]



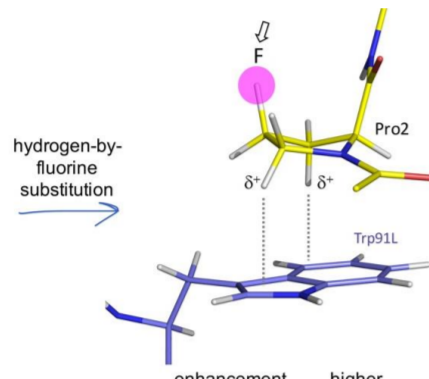
MUC1 tandem repeat domain, including the APDTRP and GSTAP epitopes recognised by the SM3 and SE5 antibodies, respectively. The arrows indicate the possible glycosylation positions.

Mucin-1 is...

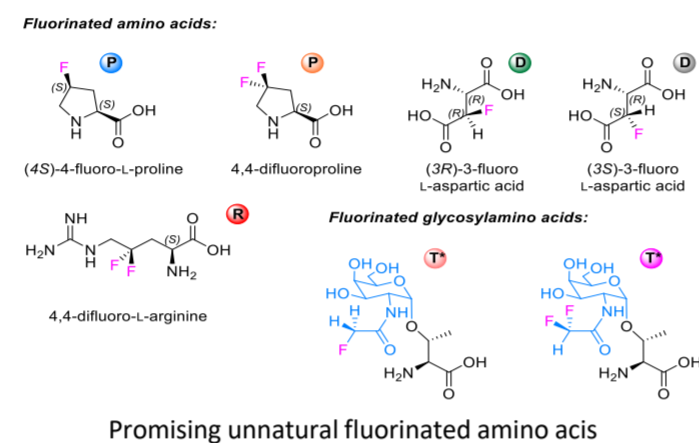
- ✓ Abundant in the majority of the cancers^[1,2]
- ✓ Different post-translational modifications in healthy and cancer cells^[1]
- X Low Immunogenicity
- X Low Stability

Incorporation of unnatural amino acids offers:

- Increased stability
- Increased immunogenicity
- Enhanced binding affinity to anti-MUC1 antibodies

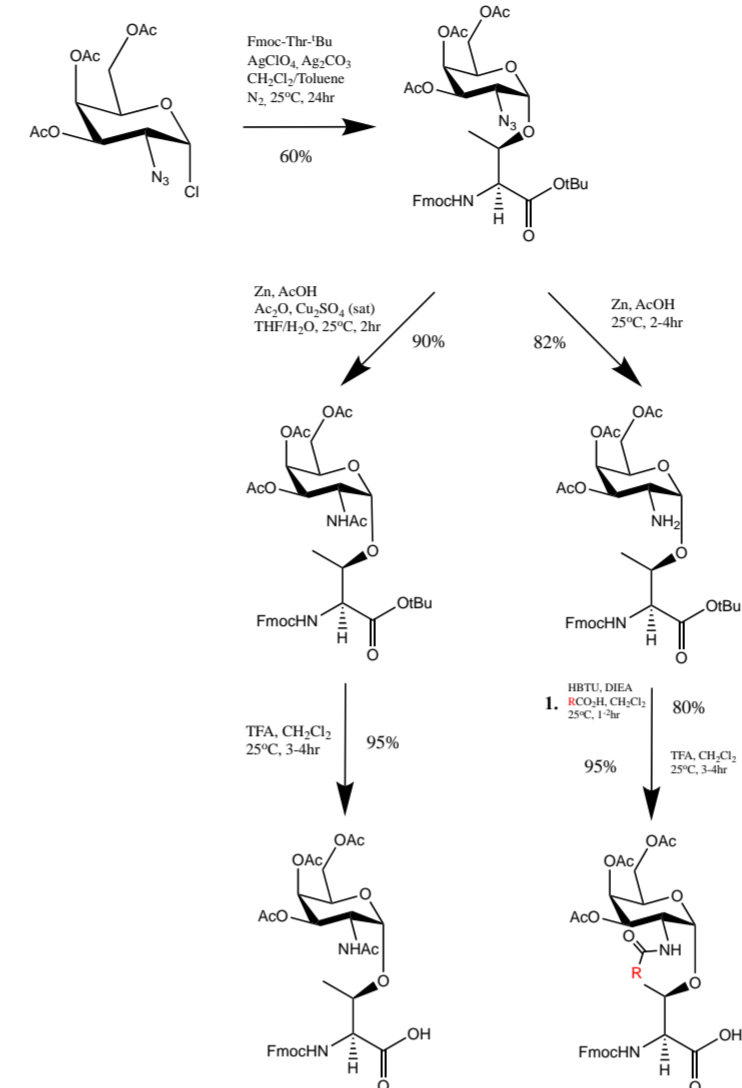


Hydrogen-by-fluorine substitution to enhance the CH/π interactions, and overall antibody binding affinity.^[3]



Promising unnatural fluorinated amino acid

Unnatural amino acids featuring sugar modifications



Based on previous studies, certain sugar modifications can:

- Enhance antibody binding affinity
- Increase stability significantly
- Maintain peptide original structure & natural folding

Several peptides have already been prepared, in anticipation of SPR results.



Positive Control

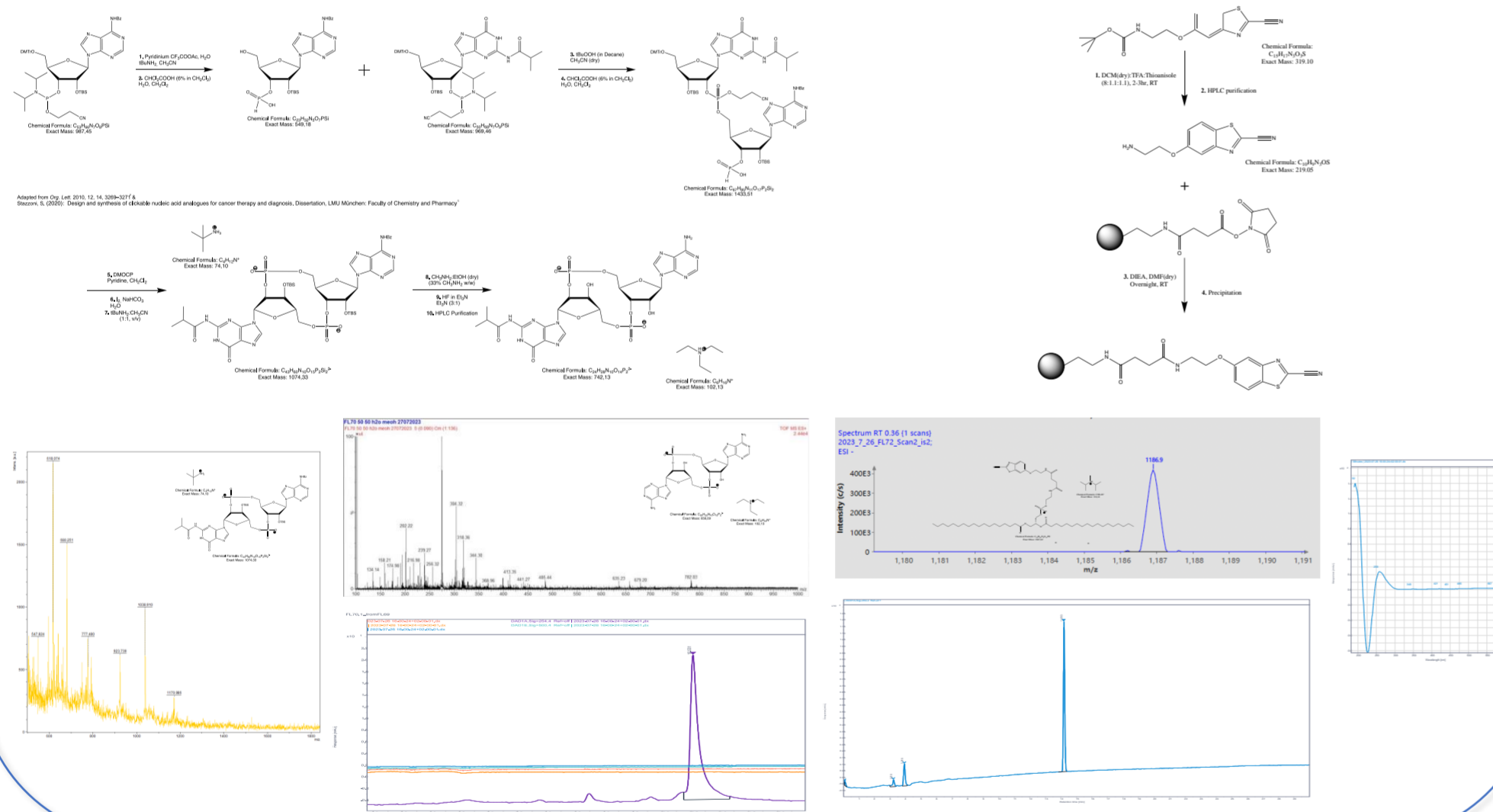
Negative Control

- T Indicates unnatural amino acid.
- X Indicates fluorinated unnatural amino acid.
- T Indicates the Tn-Threonine.

UNIVERSITY OF TWENTE.

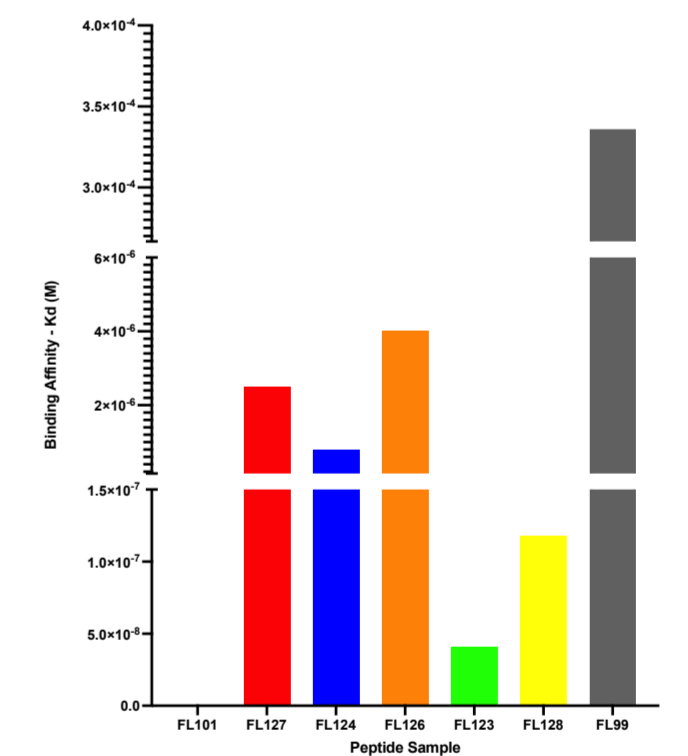
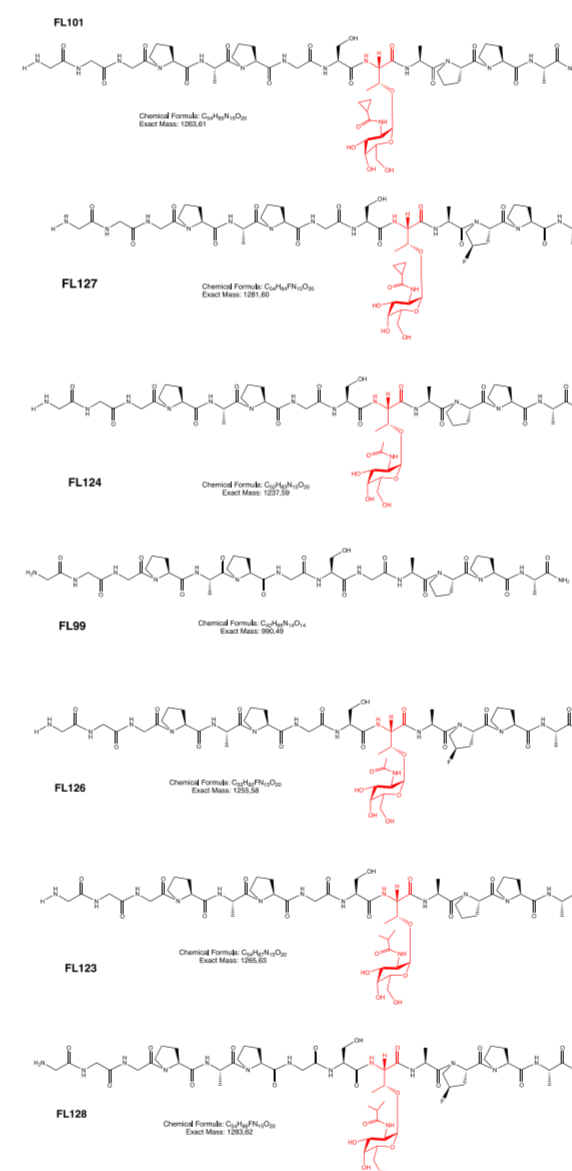
cGAMP & CBT-DSPE synthesis - Secondment Activity

Lipocoat



Surface Plasmon Resonance (SPR) results:

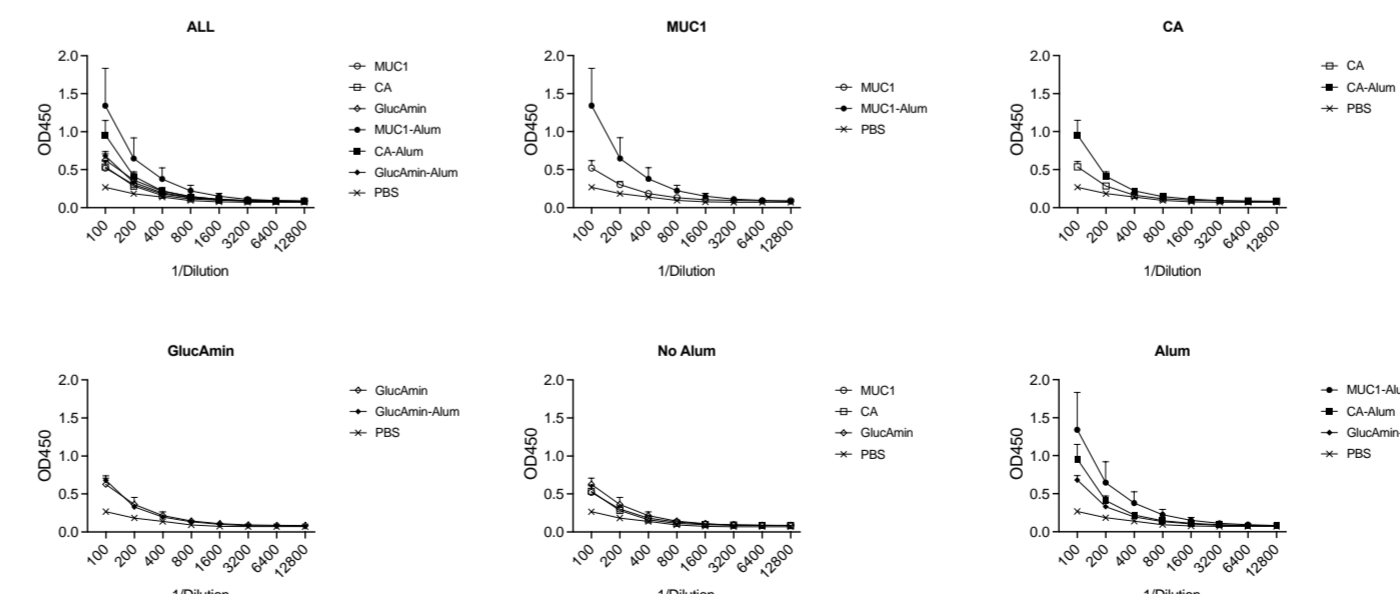
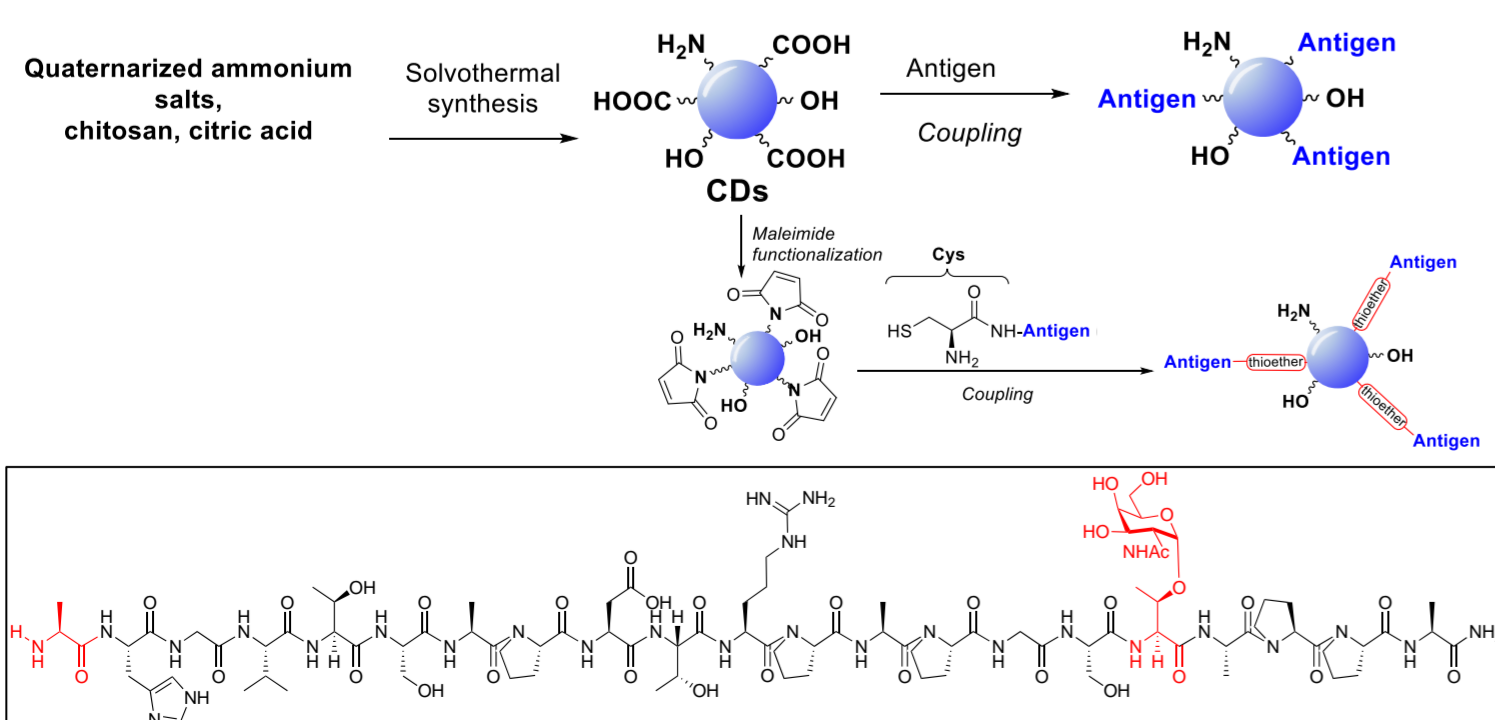
- Confirmed the enhanced binding affinity of certain biomimetics towards the SE5 antibody
- Most promising peptide candidates will be functionalized with a DBCO linker and will be mounted to an N₂-functionalized coating provided by SuSoS AG*
- Development of a more sensitive & specific cancer diagnostic assay



*For more information, check Tobias Komsthof (ESR13) poster

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Nano-vaccine candidates utilizing unnatural amino acids & functionalized Carbon Dots



- Carbon Dots (CD) do not enhance the antigen's immunogenicity even in combination with an adjuvant
- Similar antibody titers between MUC1+Alum & MUC1+Alum-CD observed
- Physicochemical characterization of the CD-MUC1 complexes still pending
- MUC1 attachment to the CD assessed by ¹H-NMR

Acknowledgements



References

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