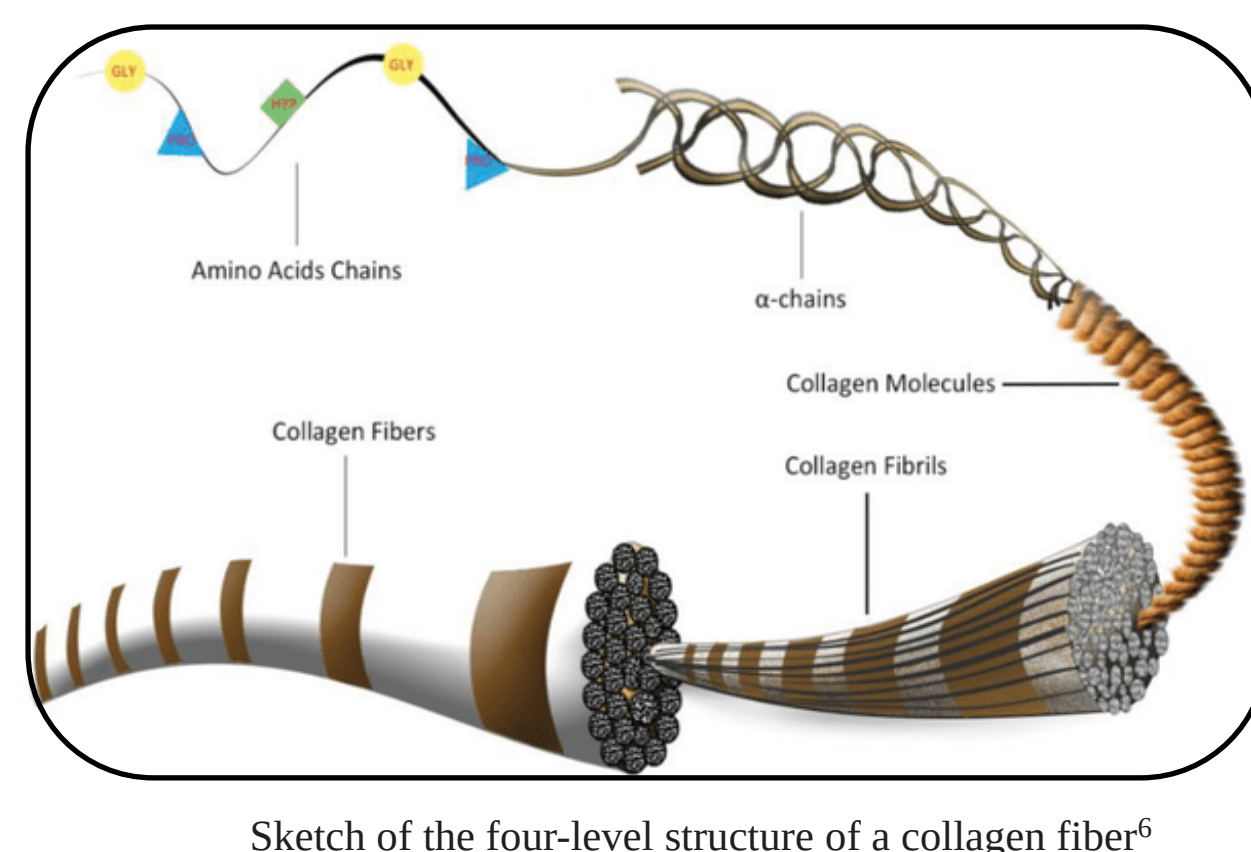


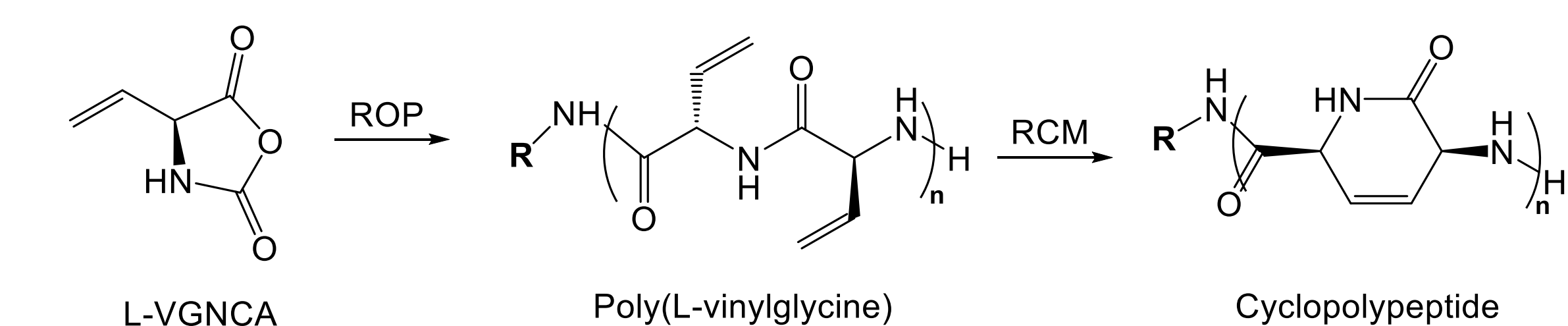


Introduction

- Collagen-like polypeptides¹
- Bioactivities^{1,2}
- Biocompatible^{1,2}
- Self-assembling capabilities^{1,2}
- Applications in tissue engineering^{1,2,3}

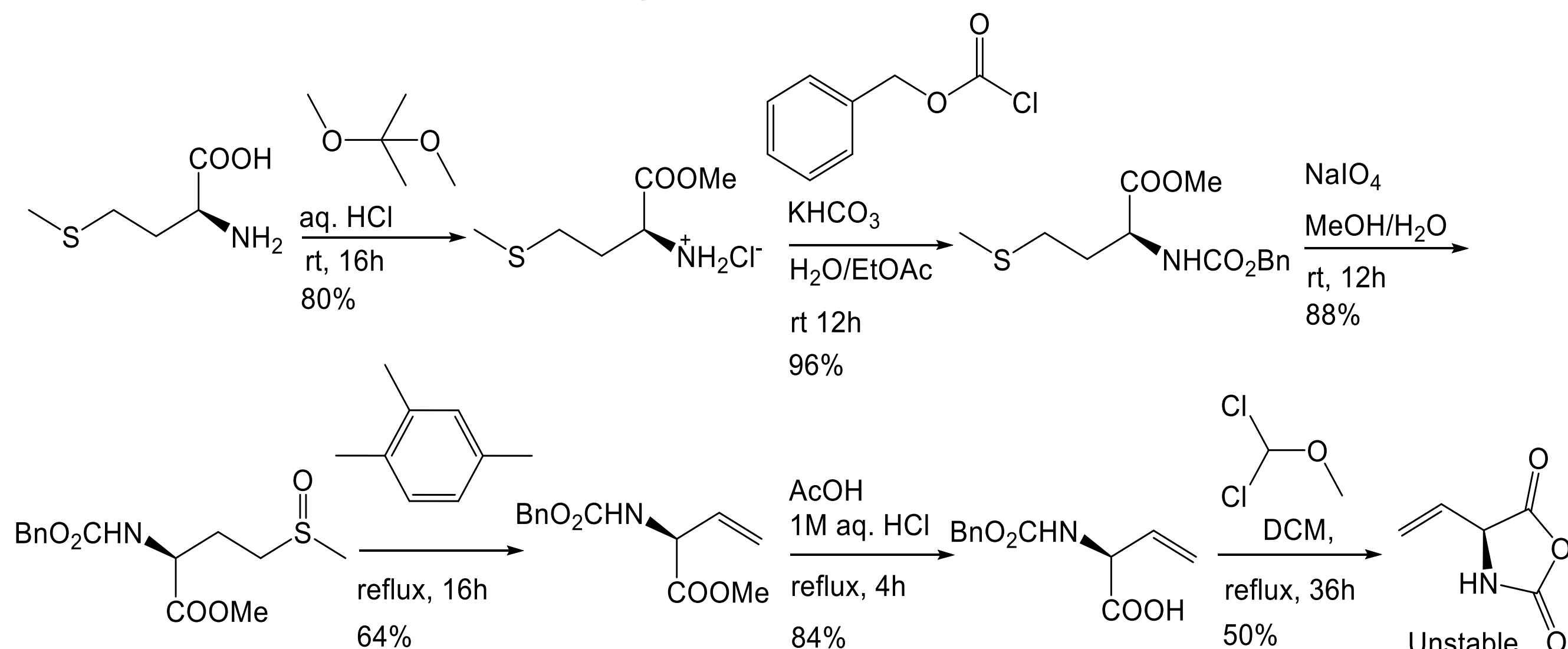


Project objectives

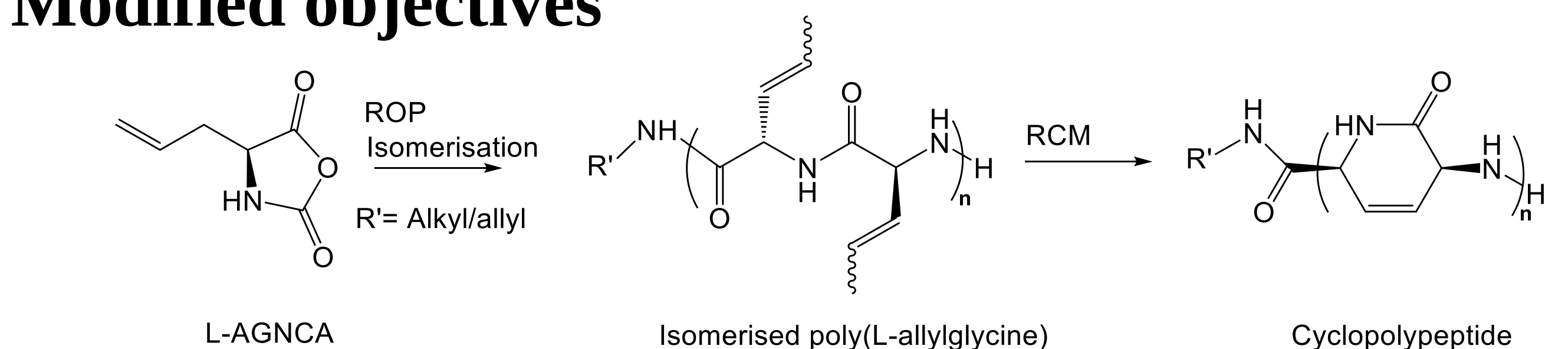


- Synthesis of novel cyclopolypeptides by RCM.⁴
- Cyclopolypeptides hydrogenation and functionalisation by thiol-ene addition.²
- Self-assembly studies for developing triple helix as found in collagen.^{1,5}

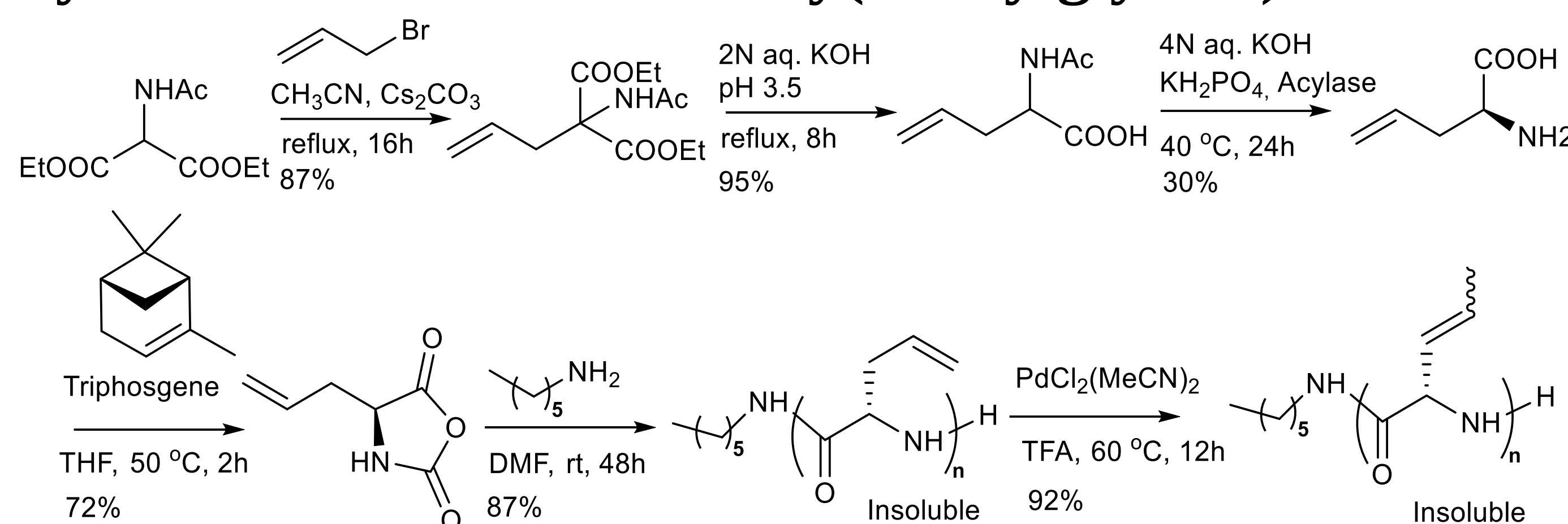
Synthesis of L-Vinylglycine N-carboxyanhydride⁷⁻⁹



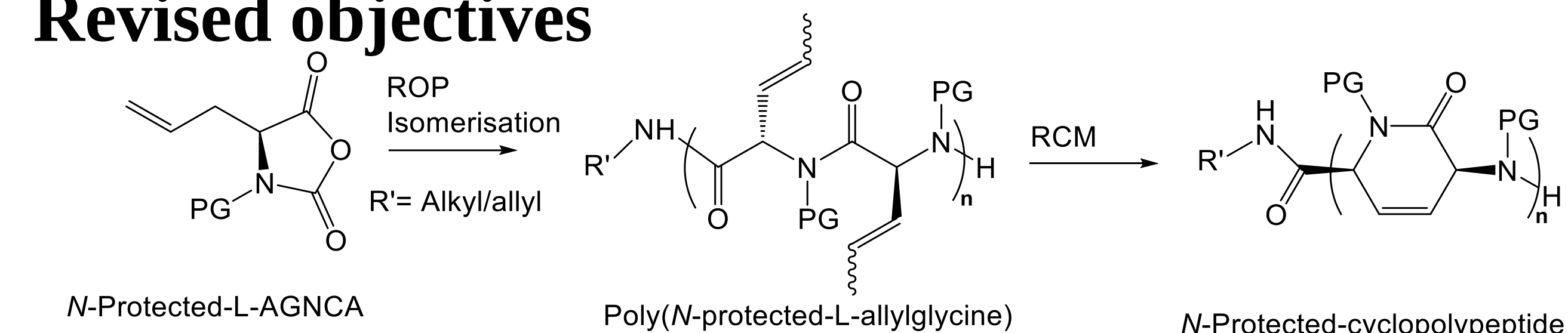
Modified objectives



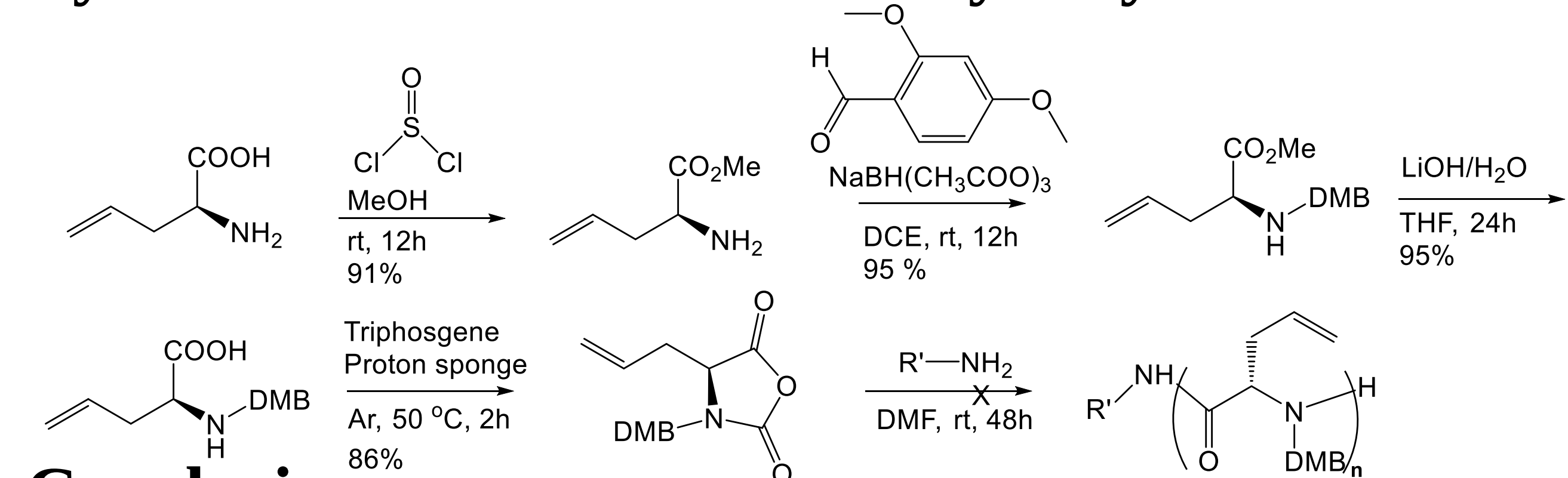
Synthesis of Isomerised Poly(L-allylglycine)¹⁰⁻¹²



Revised objectives



Synthesis of *N*-DMB-*N*-carboxyanhydride¹³⁻¹⁵



Conclusions

- L-Vinylglycine *N*-carboxyanhydride was unstable, decomposition confirmed by 2D-TLC and NMR.
- Isomerised poly(L-allylglycine) was insoluble except DMSO and TFA, decomposes in TFA on heating.

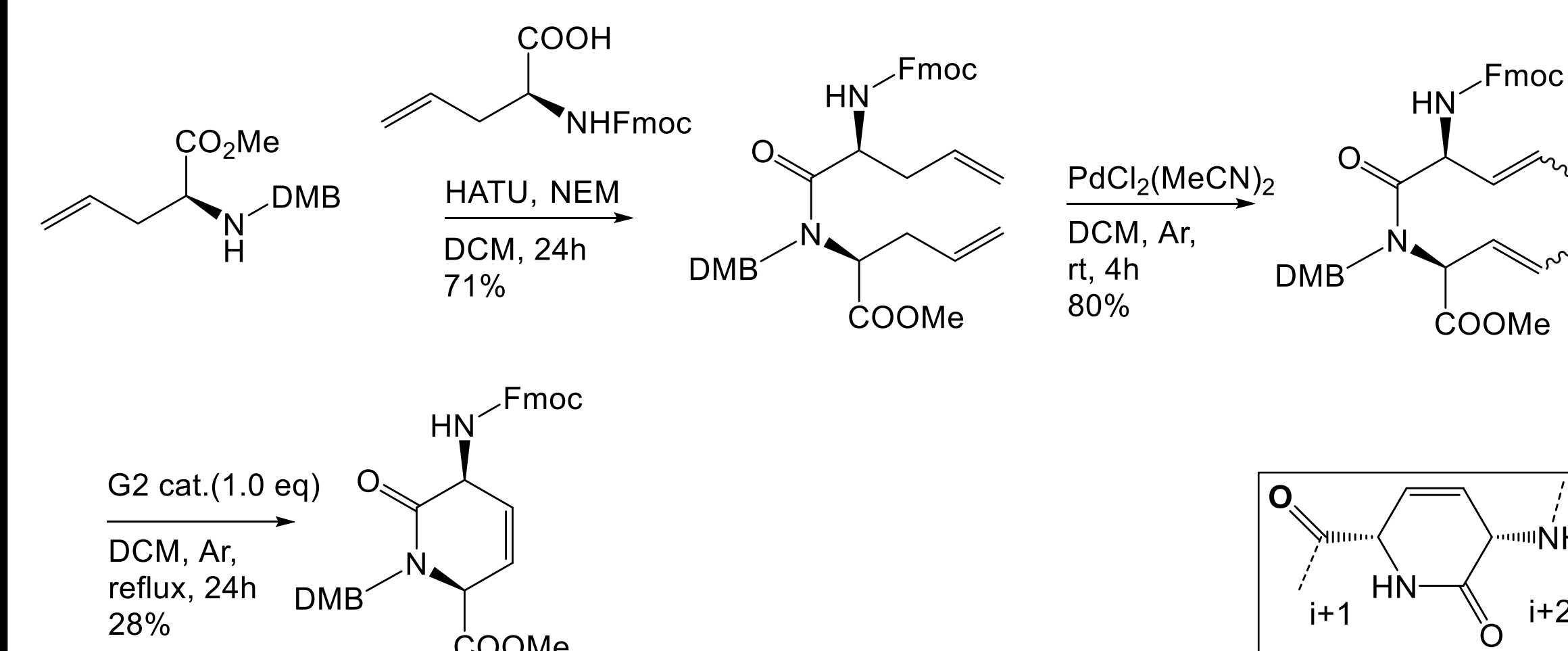
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β-turns¹⁶⁻²⁰

- Phi (φ) and Psi (ψ) angles : nearly 180°
- Distance between residues : (3.5-7 Å)
- Hydrogen bonding : C=O of AA residue *i* and NH hydrogen of AA residue *i*+3
- Flexible conformation of AA residues
- Protein-protein interactions
- Protein folding and stability
- β-sheets secondary structures

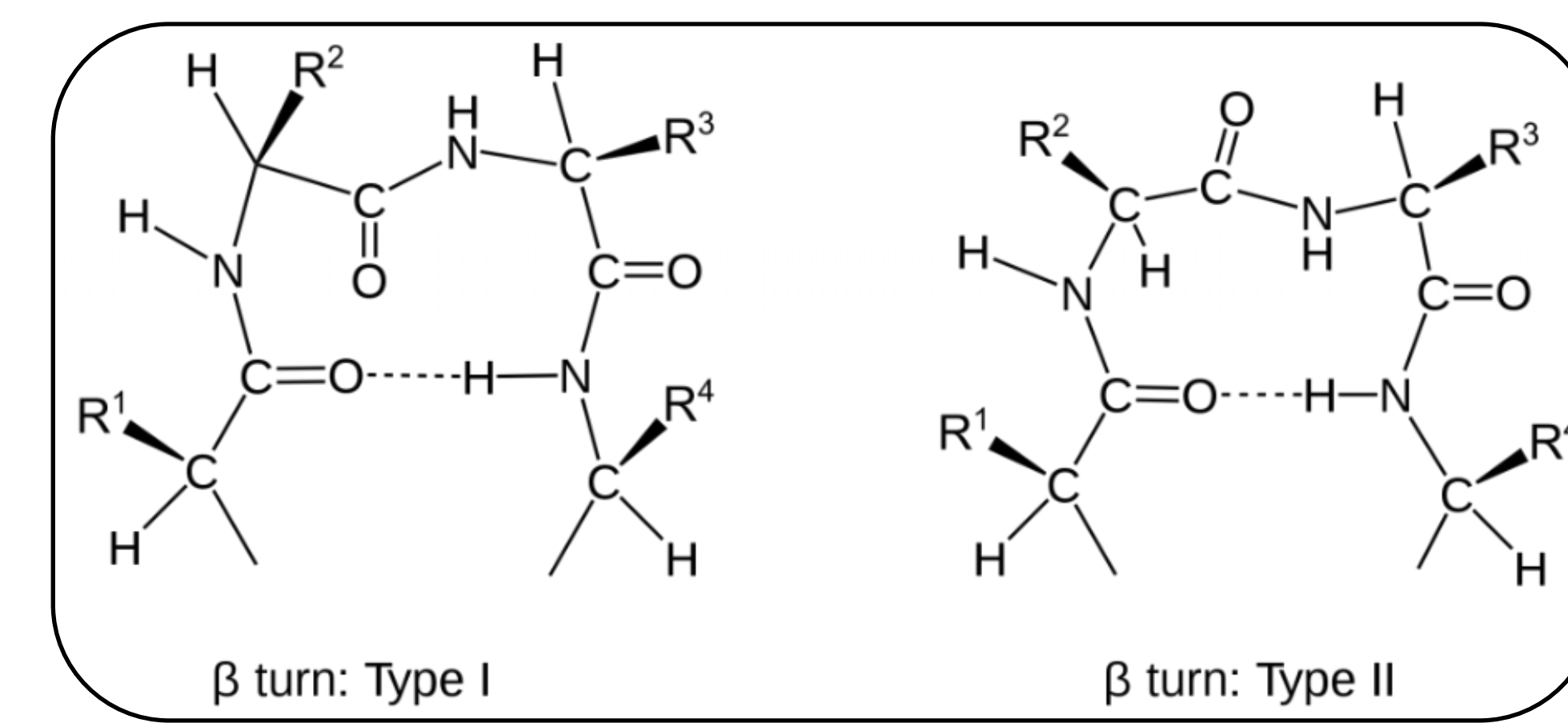
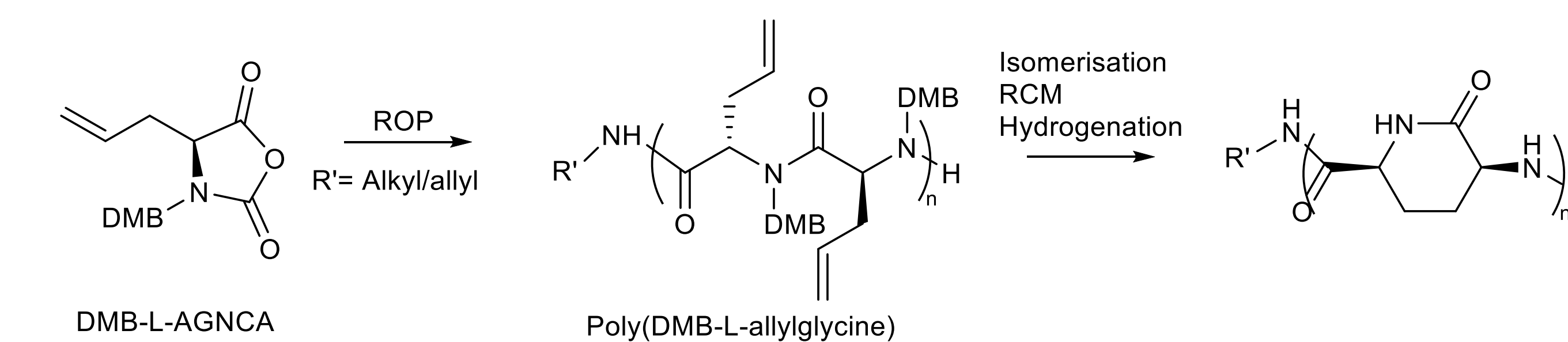
Synthesis of δ-Lactam^{13,14}



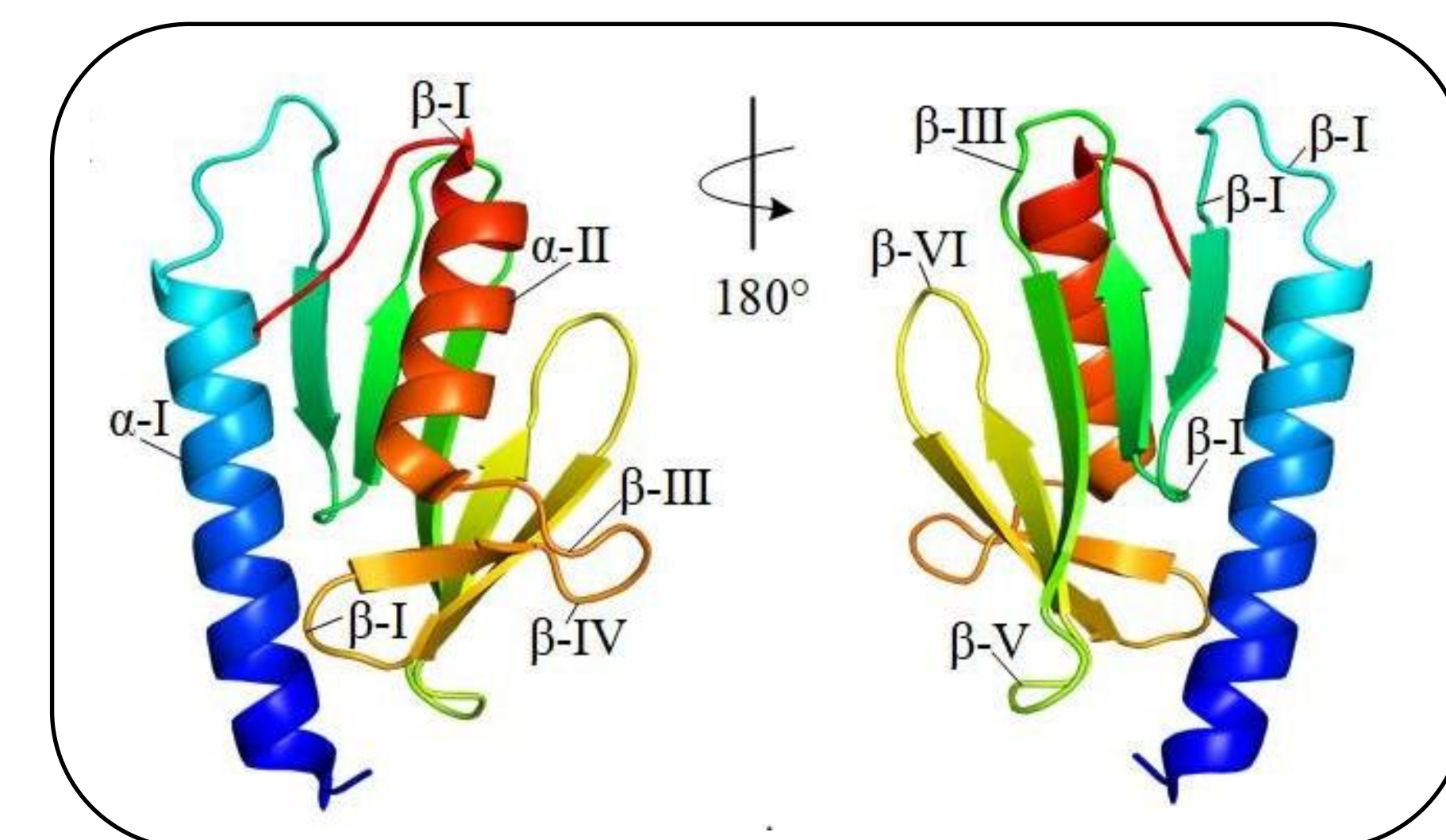
- Incorporation of this δ-lactam in a tryptophan zipper: SWTWE- δ-lactam-KWTWK and study of the resulting conformation
- Synthesis of a δ-lactam mimicking residues *i*+1 and *i*+2 in a β-turn

Future work

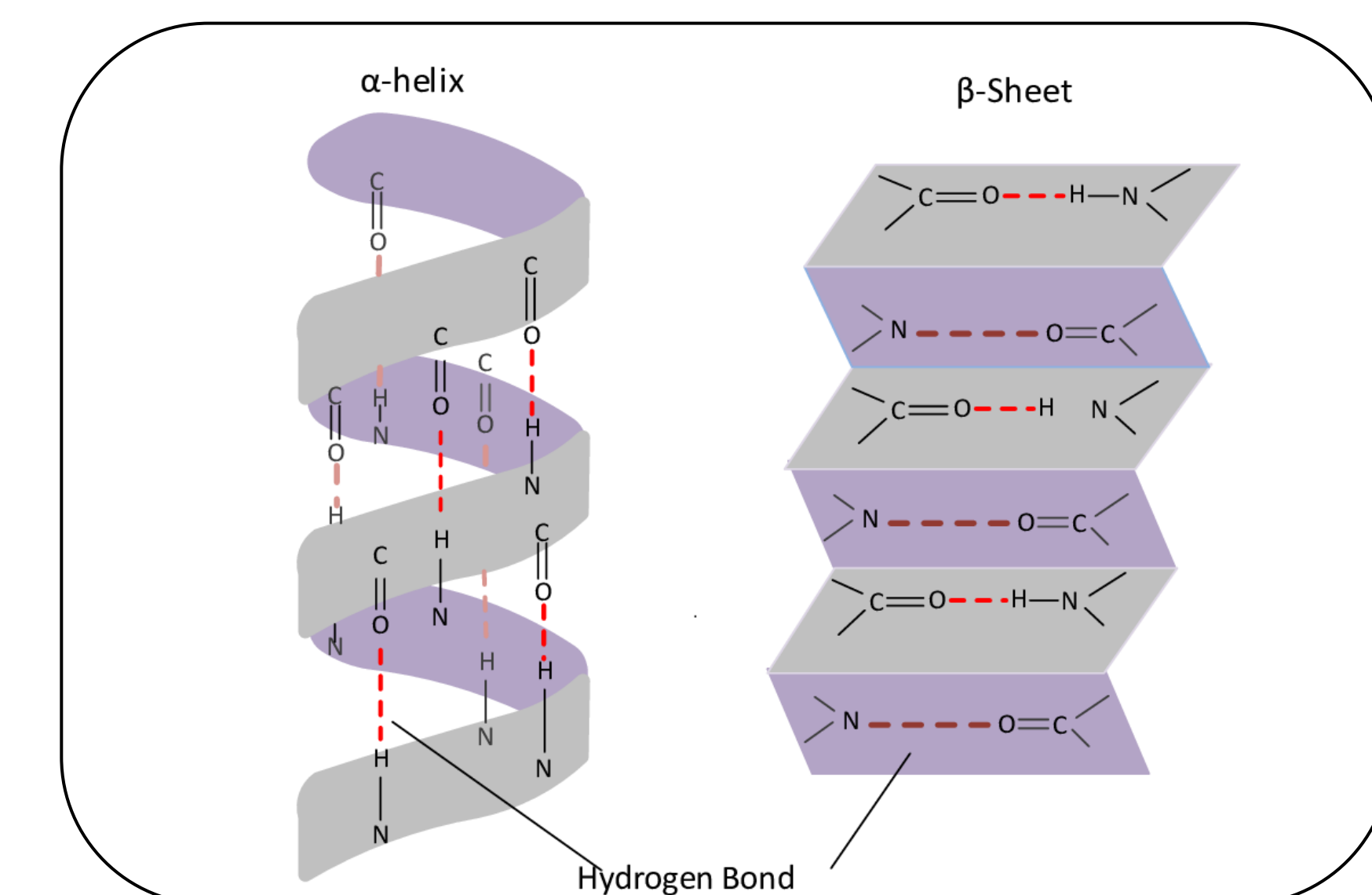
Synthesis of *N*-protected Cyclopolypeptide



Structure of β-turns (Type I and Type II)¹⁶



Resulting secondary structure through β-turns²¹



α-helix & β-sheets H-bonding in secondary structure²²

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