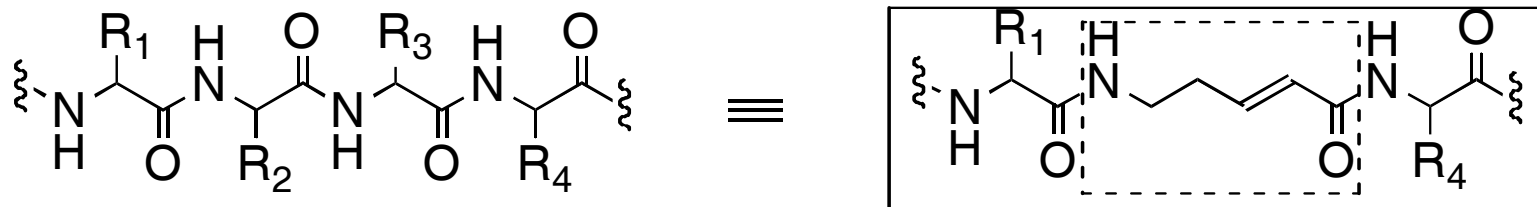


# Using cross metathesis to generate peptide-polymer hybrids



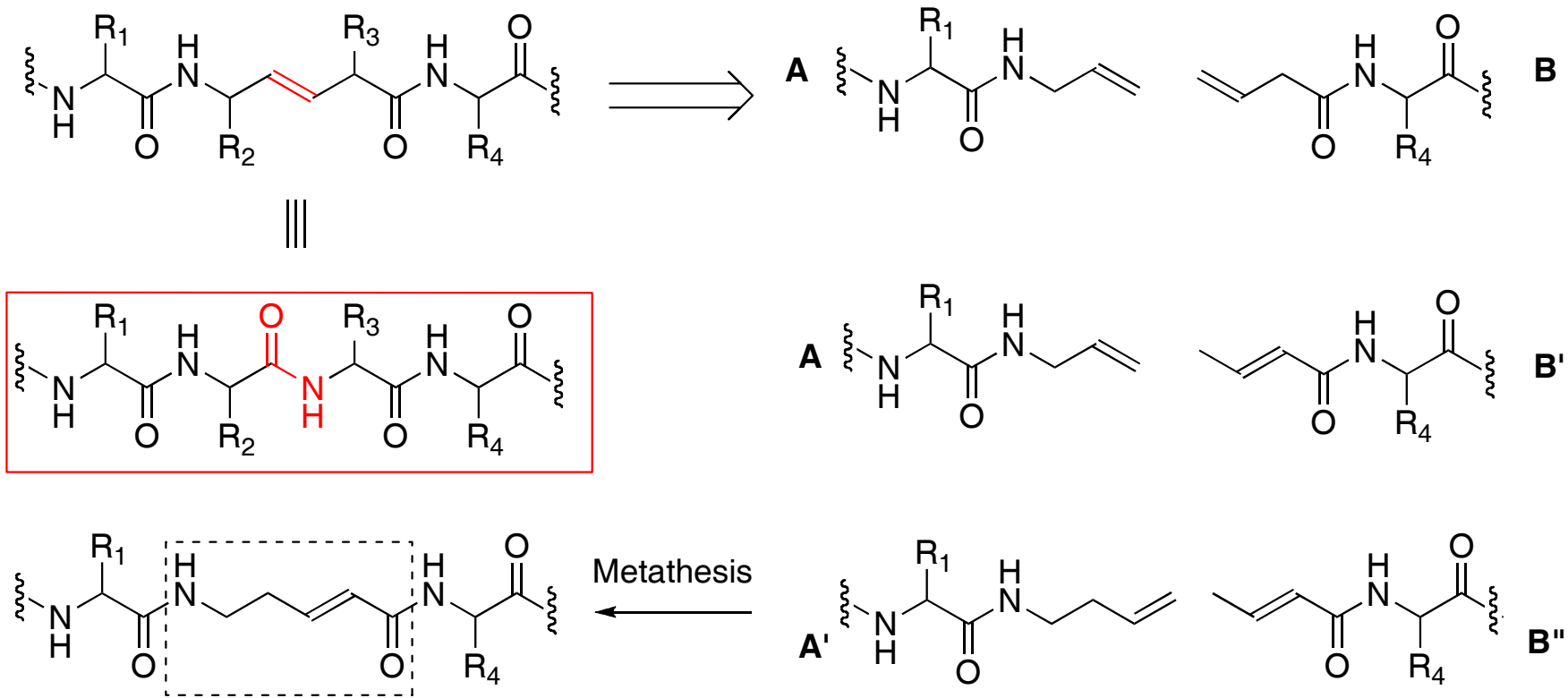
Andrea J Robinson, Rebecca Garland, Amanda Whelan  
Zuzanna Kosowski, William Roy Jackson

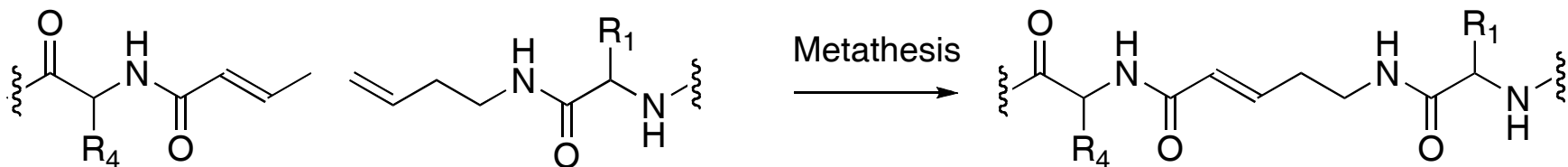
School of Chemistry, Monash University  
Melbourne, Australia

# Aims

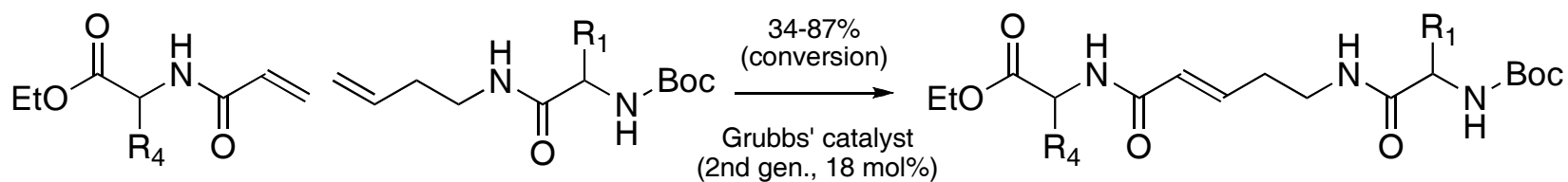
- Facile, simple in design and amenable to large scale
- Compatible with SPPS and microwave-technology
- Generic and flexible to accommodate a full range of functionality and residue types (e.g. amino acids, lipids, sugars)
- Proceed via a well-defined reaction mechanism to give **well defined N→C defined polymers** without competing reactions involving side-chain functionality
- Provide excellent control over structure and polymer size (no random monomer incorporation)
- Allow monomer purification and characterisation prior to polymerisation for quality control and batch validation

# Approach

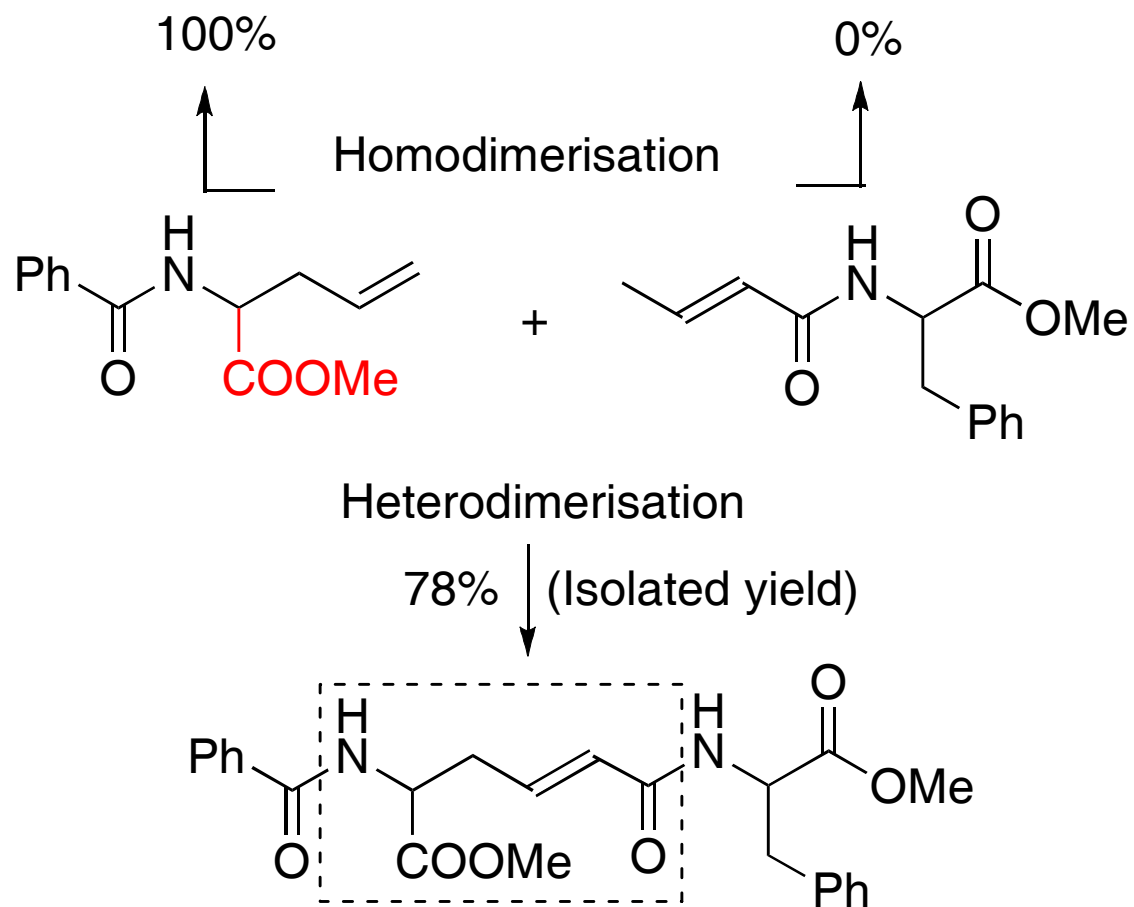




- Cross metathesis of propenyl/butenyl amine derivatives
- Yields of heterodimer variable, generally low
- Caddick *et al.*

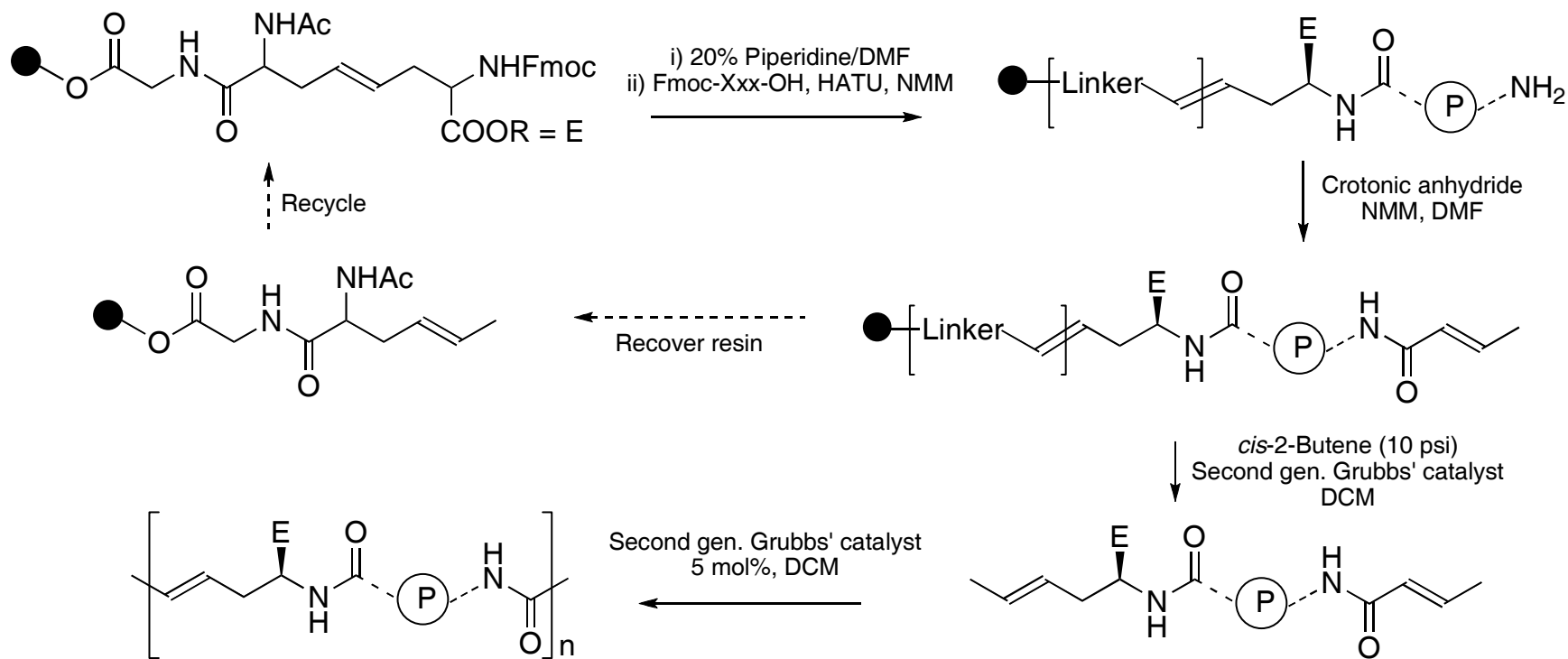


**Ligation:** Morris, T., Sandham, D., Caddick, S. *Org. Biomol. Chem.*, 2007, 5, 1025-1027



Conditions for CM rxns:- Second generation  
Grubbs' catalyst (5 mol%), DCM, reflux

# Method

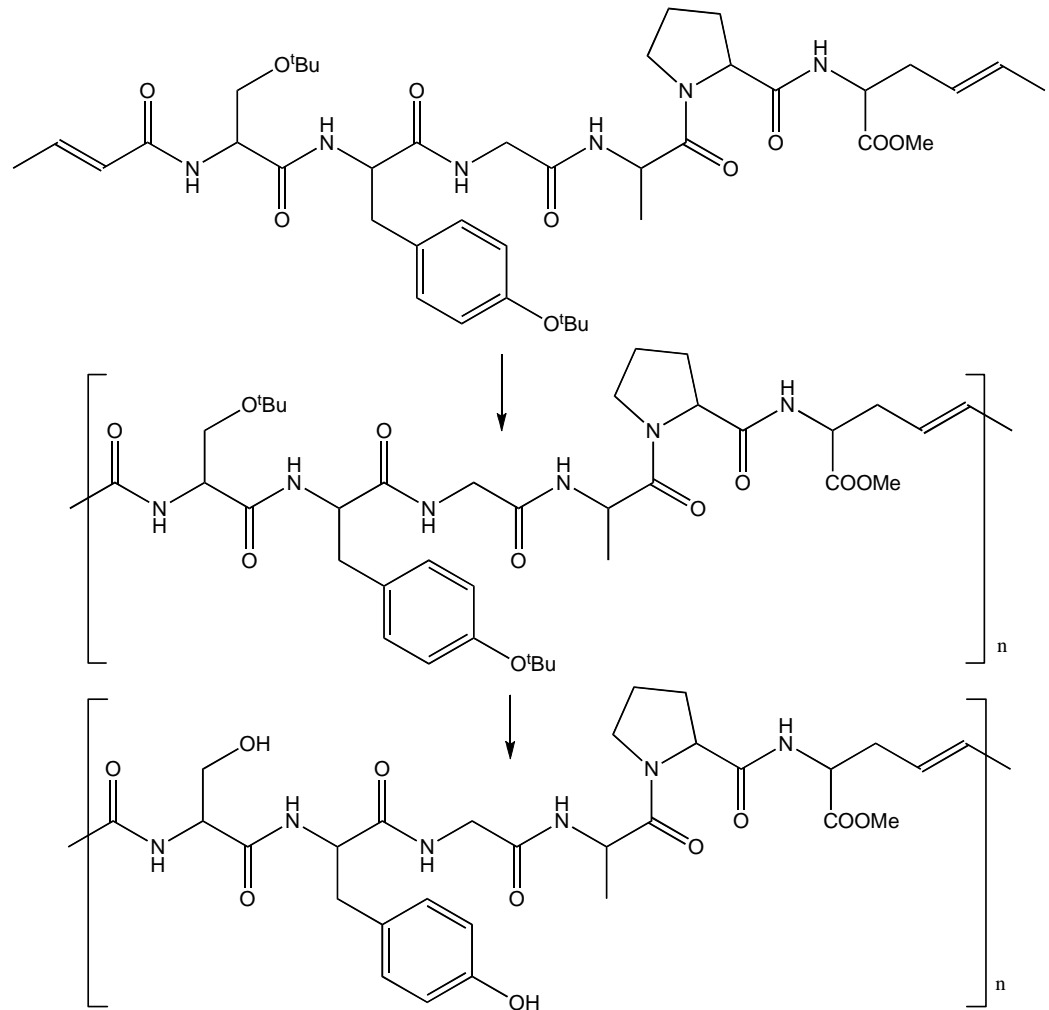


# Resilin

- Elastomeric protein
- High resilience rubber  
High fatigue lifetime
- Elastic repeat motif  
**GGRPSDSY**GAPGGGN
- Cross-linked tyrosine



Elvin: Nature, 2005, 999-1002.



- High polymer yield
- 100% trans stereochemistry
- $\bar{M}_w$  85,000g/mol, PDI 1.6