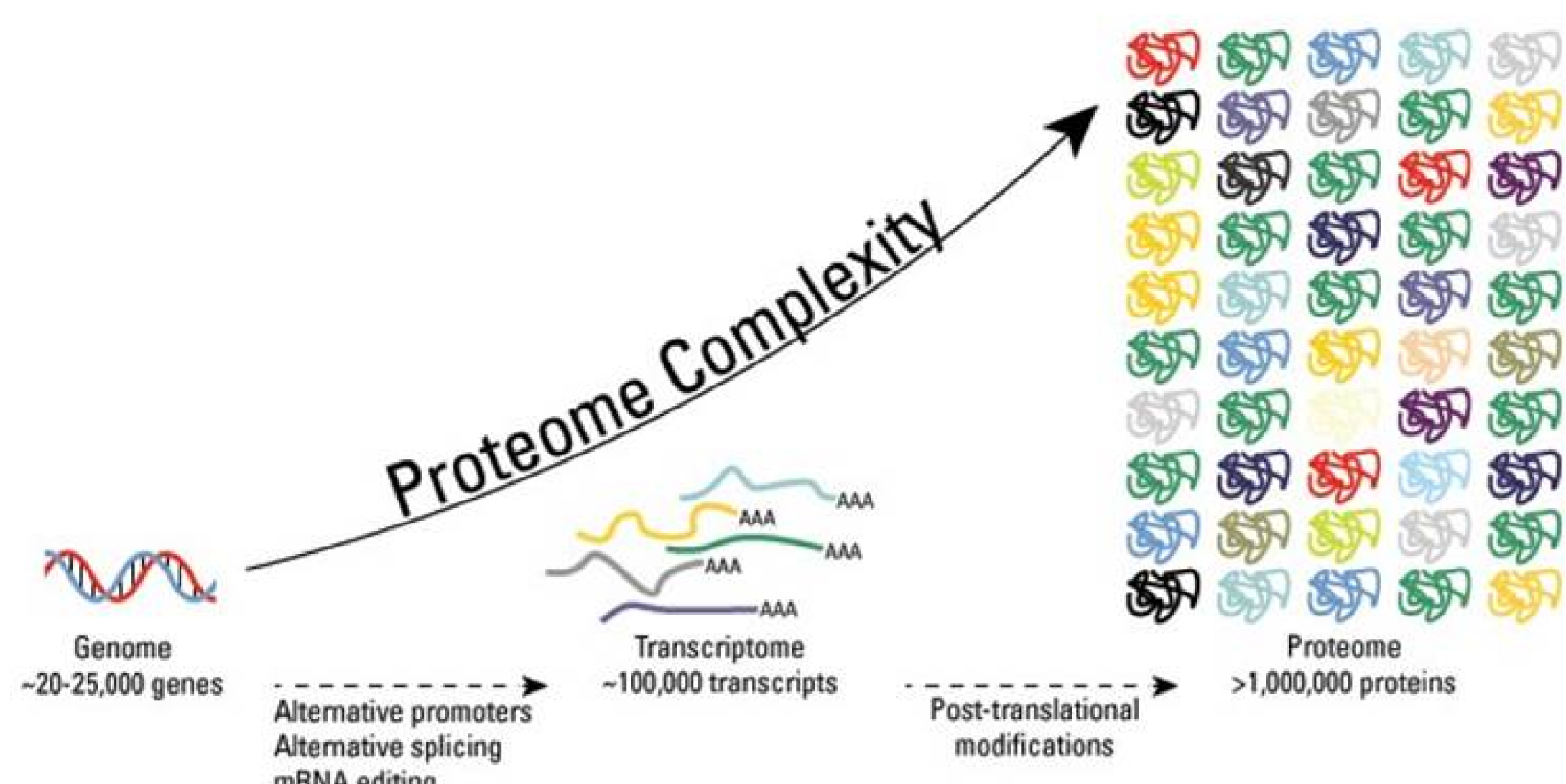


유기합성을 이용한 단백질의 post-translational modification(PTM)

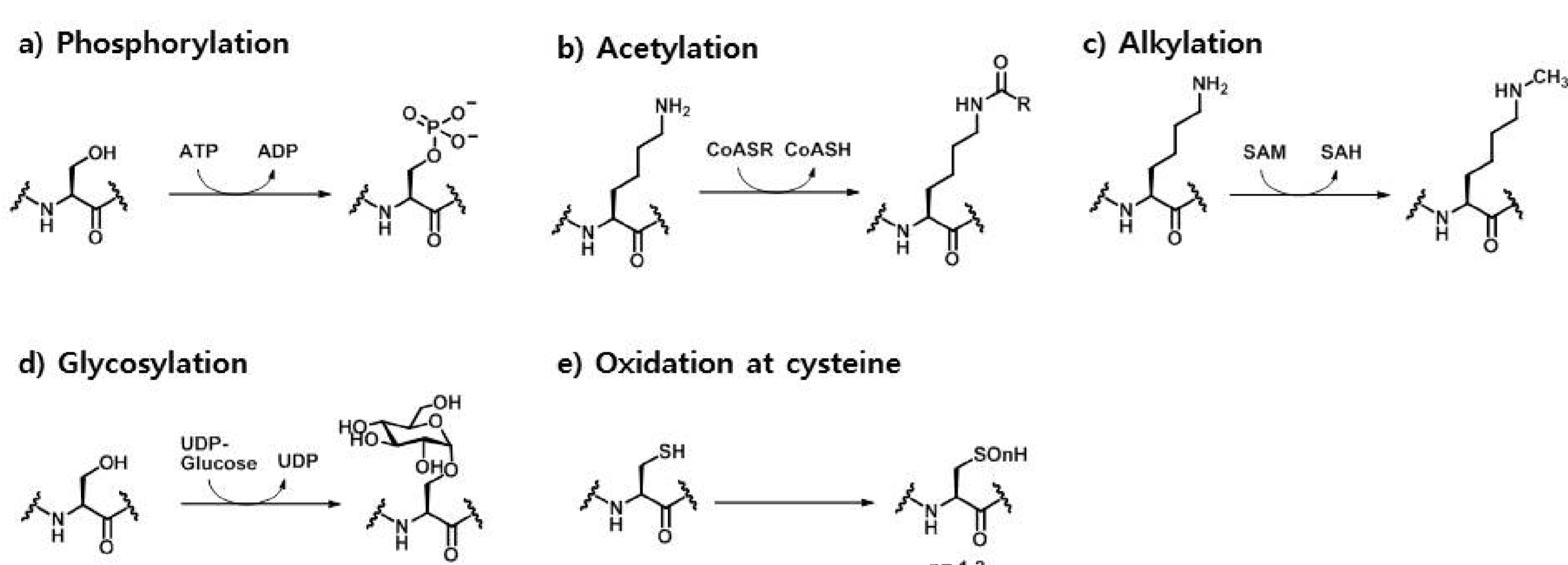
이흥수(화학과)
석박사과정 모험연구사업

Introduction

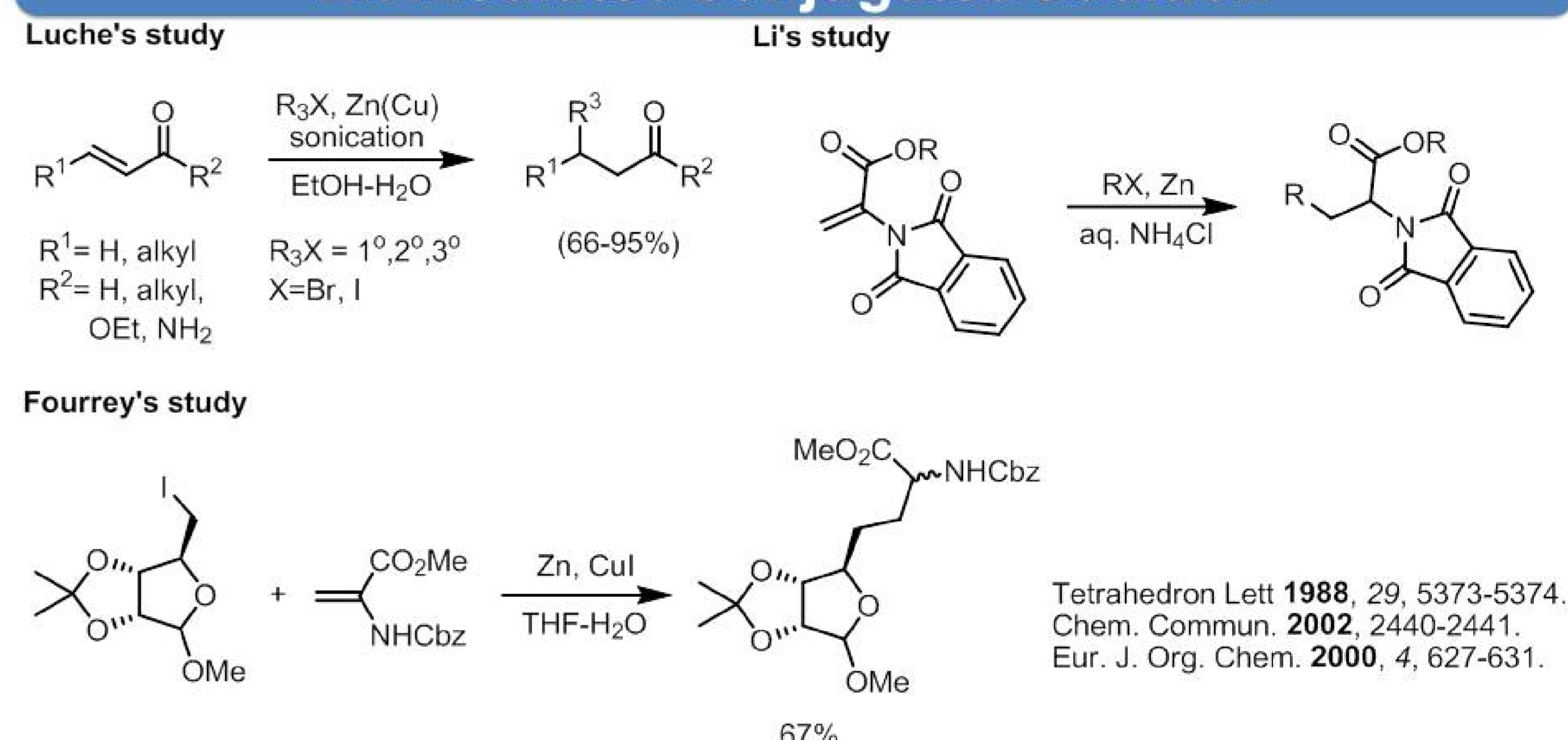
Post-translational modification



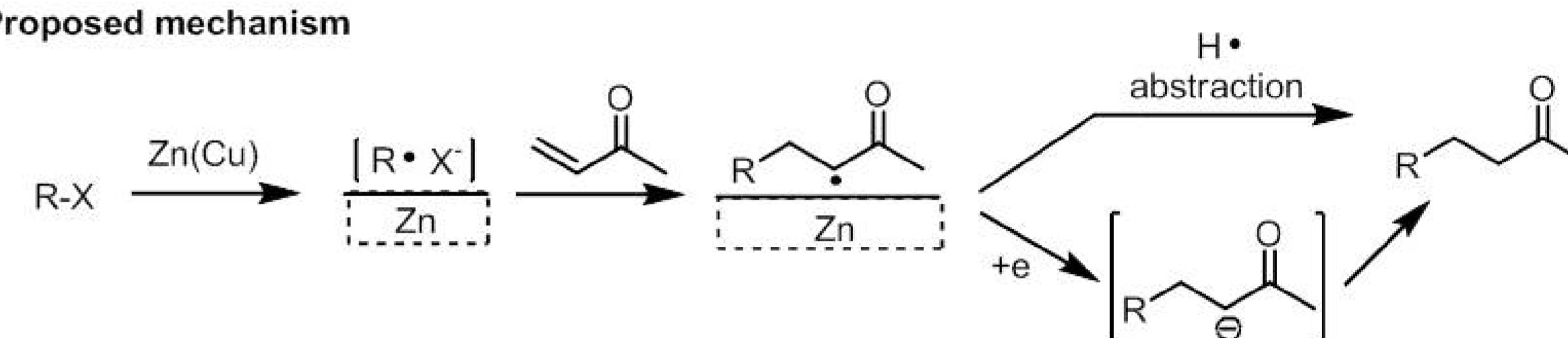
<Five common types of covalent post-translational modifications>



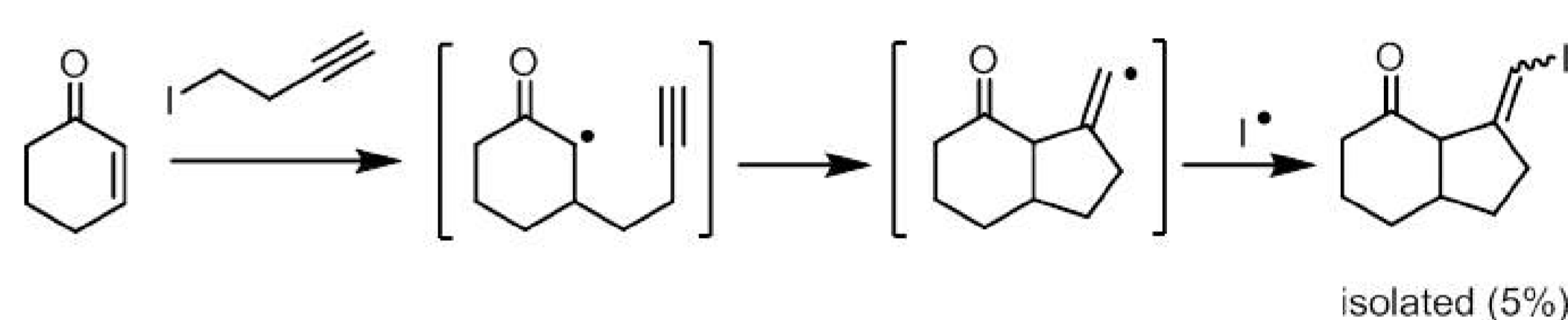
Water Compatible Organic Reaction: Zn mediated conjugated addition



Proposed mechanism

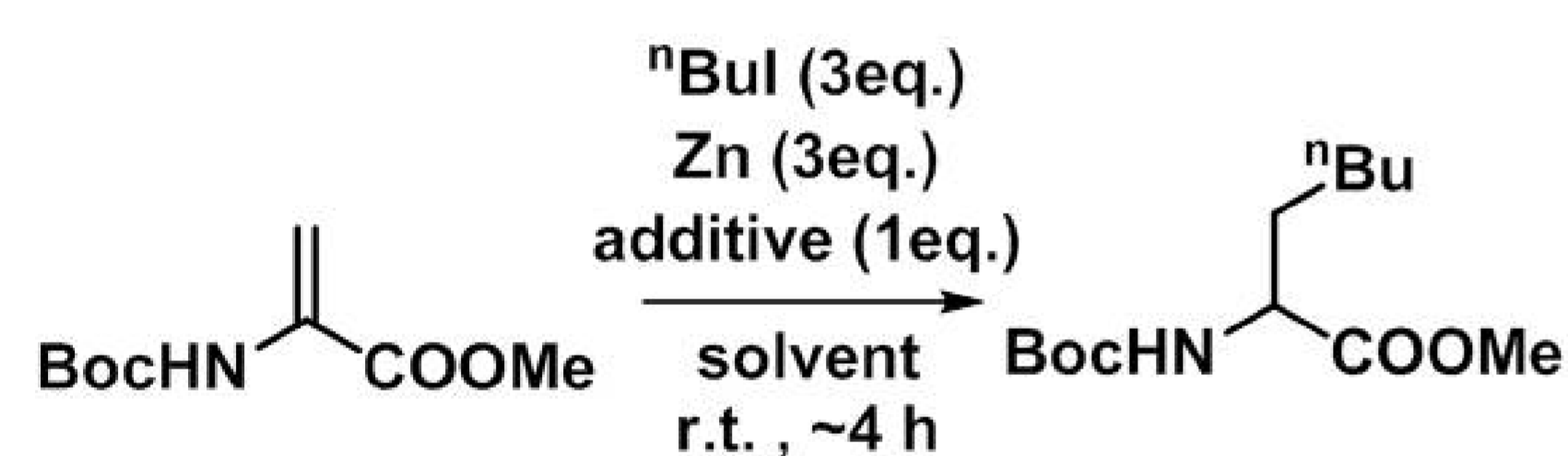


Trap the intermediate



Results & Discussion

Optimization of reaction conditions

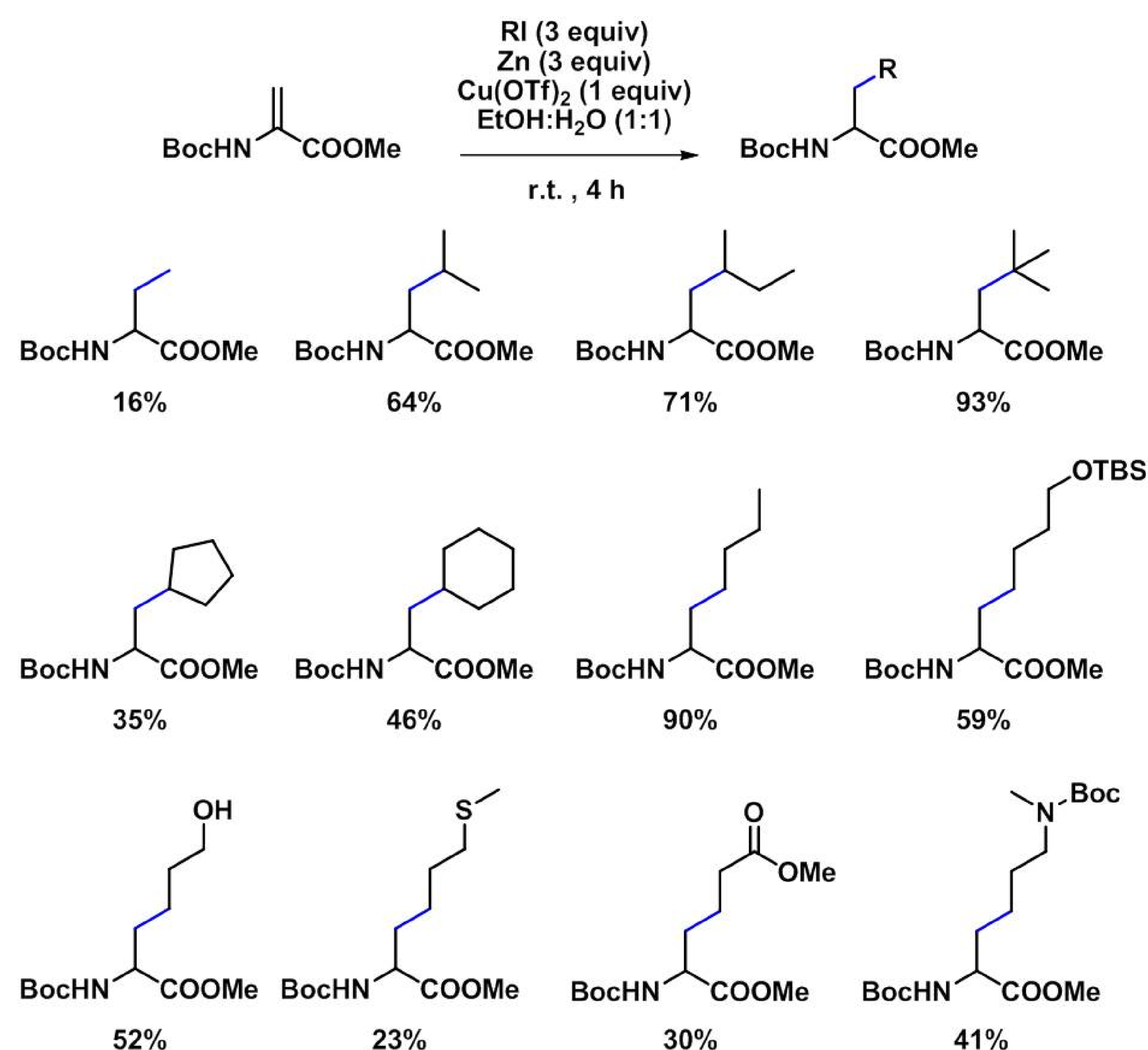


entry	solvent	additive	yield ^a (%)
1	THF:H ₂ O(1:1)	-	n.r.
2	EtOH:H ₂ O (1:1)	-	n.r.
3	EtOH:sat.NH ₄ Cl (1:1)	-	trace
4	EtOH:H ₂ O (1:1)	Cu(I)	40
5	EtOH:H ₂ O (1:1)	CuCl ₂ (II)	60
6	EtOH:H ₂ O (1:1)	Cu(OAc) ₂ (II)	60
7	EtOH:H ₂ O (1:1)	Cu(OTf) ₂ (II)	90
8	EtOH:H ₂ O (1:1)	Cu(acac) ₂ (II)	42
9	EtOH:H ₂ O (1:1)	Cu(hfac) ₂ (II)	36
10 ^b	EtOH:H₂O (1:20)	Cu(OTf) ₂ (II)	93
11	EtOH:H ₂ O (1:1)	InCl(III)	trace
12	EtOH:H ₂ O (1:1)	Sc(OTf) ₃ (II)	trace

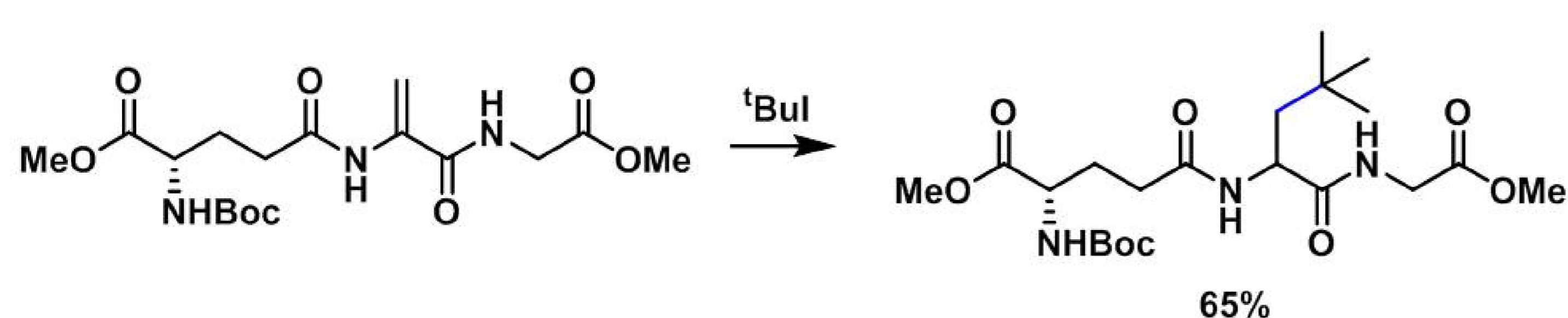
^aIsolated yields.

^bLow concentration : Dha(20mM), ⁿBul(3mM), Zn(5mM), Cu(OTf)₂(1mM).

Substrate scope of alkyl iodides



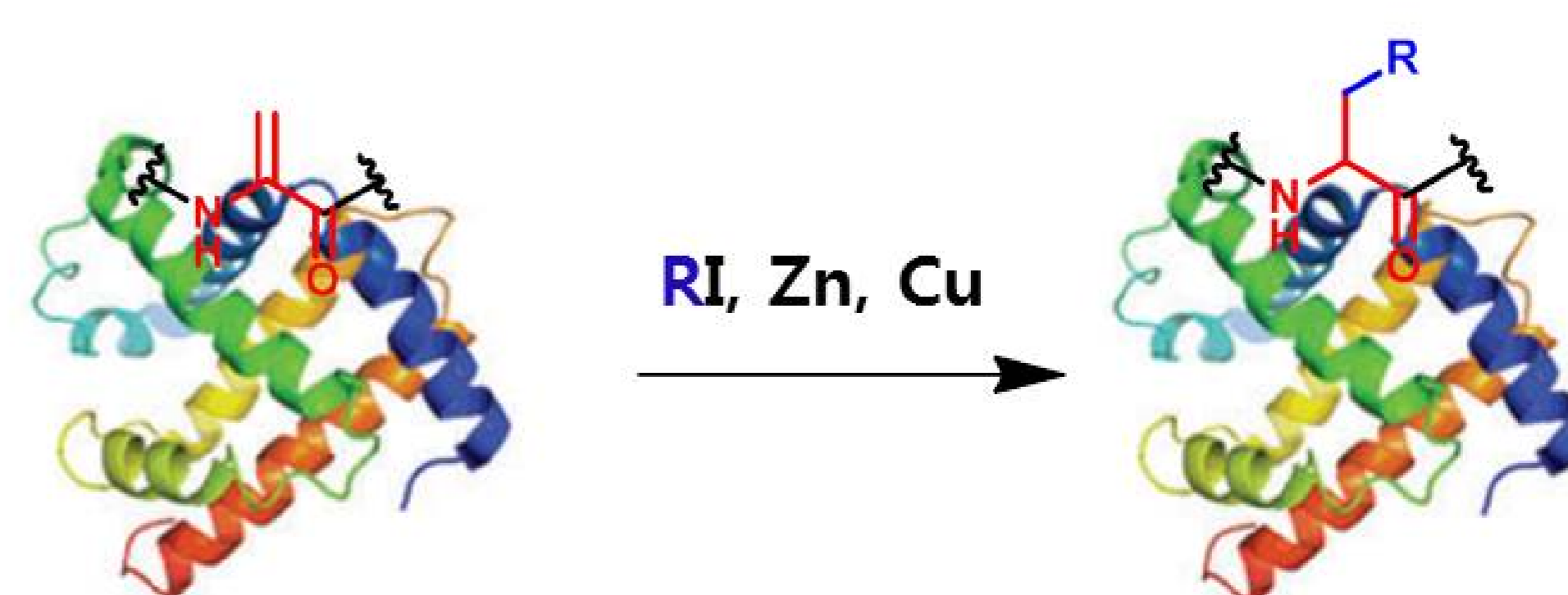
Reaction in peptide



Condition : ^tBul(3 eq.), Zn (3eq.), Cu(OTf)₂ (1eq.), EtOH-water (1:1, v/v) with vigorously stirring for overnight.

Perspective

Zn-mediated radical reaction in proteins



PTM through new Zn-mediated C-C bond coupling reaction