  - Lipoylation: The attachment of a lipoate (C8) functional group
  - The covalent attachment of a flavin moiety
  - Heme C attachment via thioether bonds with cysteine
  - Phosphopantetheine-lation: The addition of a 4′-phosphopantetheine moiety from coenzyme A, as in fatty acid, polyketide, nonribosomal peptide, and leucine biosynthesis
  - Retinylidene Schiff base formation
- PTMs involving unique modifications of translation factors
  - Diphthamide formation (on a histidine found in eukaryotic translation elongation factor 2)
  - Ethanolamine phosphoglycerol attachment (on glutamate found ineukaryotic elongation factor 1α)
  - Hypusine formation (on conserved lysine of eukaryotic translation initiation factor 5A-1 (eukaryotic) and aIF5A gene (archeal)
- PTMs involving the addition of smaller chemical groups
  - Acylation, e.g., O-acylation (esters), N-acylation (amides), S-acylation (thioesters)
    - Acetylation: The addition of an acetyl group, either at the N-terminus of the protein or at the lysine residues; the reverse is called deacetylation
    - Formylation
  - Alkylation: The addition of an alkyl group, e.g., methyl and ethyl
    - Methylation by the addition of a methyl group, usually at lysine or arginine residues; the reverse is called demethylation
  - Amide bond formation
    - Amidation at C-terminus
    - Amino acid addition
      Arginylation: A tRNA-mediation addition
      Polyglutamylation: The covalent linkage of glutamic acid residues in the N-terminus of tubulin and some other proteins (see tubulin polyglutamylase)
      Polyglycylation: The covalent linkage of one to more than 40 glycine residues in the tubulin C-terminal tail
  - Butyrylation
  - Gamma carboxylation dependent on vitamin K
  - Glycosylation: The addition of a glycosyl group to either arginine, asparagine, cysteine, hydroxylysine, serine, threonine, tyrosine, or tryptophan, resulting in a glycoprotein; distinct from glycation, which is regarded as a nonenzymatic attachment of sugars
    - Polysialylation: The addition of polysialic acid to neural cell adhesion molecule