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The formation of cysteine-tyrosine crosslinks via a sulfenic acid intermediate

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Cysteine residues in proteins are readily oxidized to sulfenic acids. Sulfenic acids, in turn, can act as potent electrophiles that have been observed to form intrastrand protein crosslinks with neighboring amide or cysteine residues. Cysteine-tyrosine crosslinks have also been observed in proteins, but the mechanism(s) of their formation is not clear. In the work presented here we investigated the intramolecular reaction between a sulfenic acid and a tyrosine mimic. The results provide chemical evidence that sulfenic acids have the potential to forge intrastrand protein crosslinks with tyrosine residues in proteins.