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# Gold-promoted arylation of biomolecules: selenocysteine chemoselective modification by cyclometallated gold(III) compounds

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A low pKa (5.2), high polarizable volume (3.8 Å<sup>3</sup>), and proneness to oxidation under ambient conditions make selenocysteine (Sec, U) a unique, natural reactive handle present in most organisms across all domains of life<sup>1</sup>. Sec modification offers a unique and unexplored potential for site-selective modification and probing of proteins.

Our investigation is focused on the use of cyclometallated gold(III) compounds for the chemoselective arylation of selenobiomolecules<sup>2</sup>. Here, the ability of several organometallic gold(III) compounds to promote the C-Se coupling in the active sites of Glutathione Peroxidase and Thioredoxin Reductase was studied by liquid chromatography coupled to electrospray tandem mass spectrometry. The conditions enabling the selective arylation of Se over S were found in selenoproteins, containing both Sec and Cys. Moreover, in competitive experiments, selenopeptides are preferentially arylated by gold(III) compounds, even in the presence of large excess of their Cys counterparts.

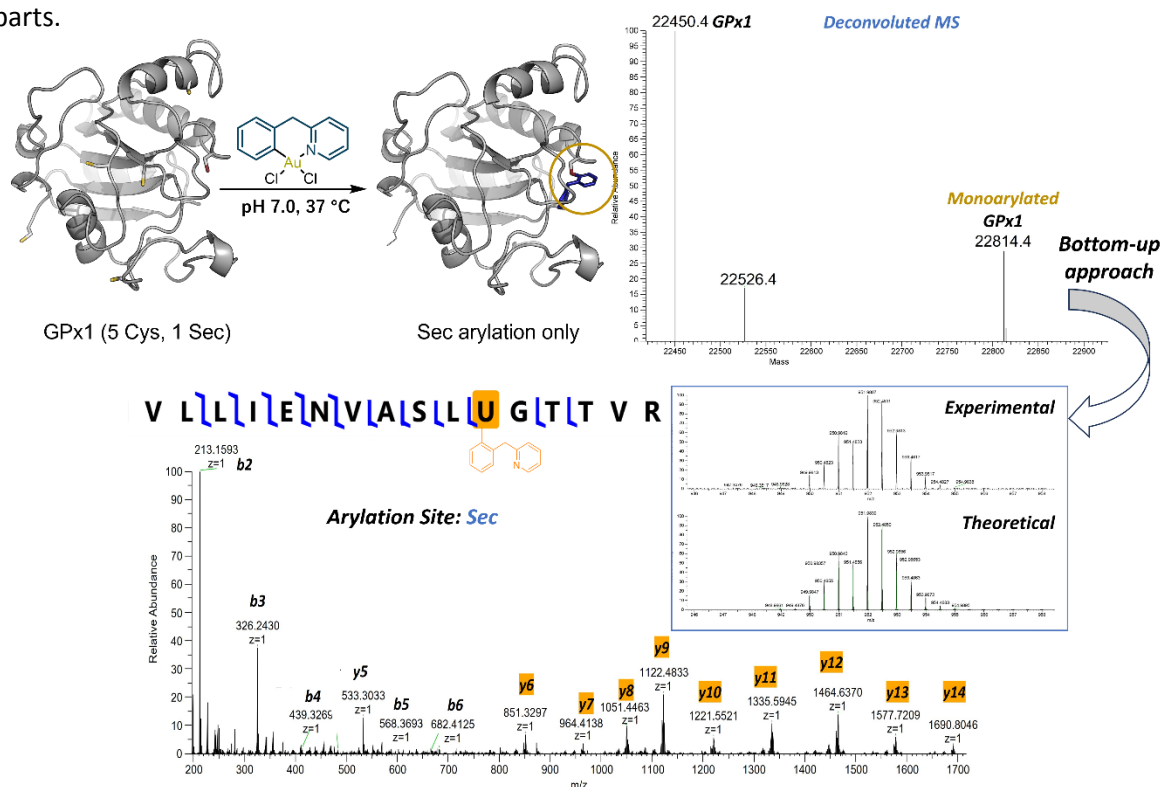


Figure 1. Selective arylation of Sec in GPx1 demonstrated by LC-ESI MS/MS

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