

The enzyme Protein Farnesyltransferase (PFTase) possesses the faculty of covalently linking isoprenoid diphosphate analogs to polypeptides. PFTase bonds the non-natural isoprenoid to the C-terminal cysteine in polypeptides containing a four amino acid recognition sequence, cysteine-valine-isoleucine-alanine (CVIA). The CVIA tag can be inserted into peptides via recombinant methods. A potential non-natural substrate for PFTase is presented here. This non-natural substrate represents an isoprenoid linked to a vinyloxybenzene moiety. The synthesized substrate and the natural substrate, farnesyl diphosphate, are both hydrophobic and of comparable size. Accordingly, the non-natural substrate stands to have similar reactivity with PFTase as farnesyl diphosphate has. The alkene based moiety in this non-natural substrate has been reported to induce peptides to become fluorescent following photoinduced cycloaddition of a diaryl tetrazole. The resulting fluorescent tag is advantageous because it is smaller than many preexisting protein tags like Green Fluorescent Protein (GFP). By virtue of its reduced size, this protein tag minimizes interference with the protein's biological function. This tag may also be implemented in the development of a coupled assay that measures protein prenylation rates