K02

A QSAR study on non-sepcific protein absorption on affirty resins

(Reverse Proteomics Research Institute Co., Ltd.) ○Akira Yamazaki, Akito Tanaka

Tubulin and actin often bind non-specifically to affinity chromatography resins, complicating research toward identifying the cellular targets of small molecules. Reduction of non-specific binding proteins is important for the success of such biochemical approaches. We quantitatively investigated the binding of tubulin and actin to a series of affinity resins bearing fifteen variant ligands on three commercially available polymer supports. Non-specific protein binding was proportional to the hydrophobicity of the affinity resins and could be quantitatively correlated to the CLOGP values of the ligands, which are a measure of compound hydrophobicity. When compounds had CLOGP values greater than 1.5, (amount of tubulin)=0.73*CLOGP-1.1 (n=7, r=0.97), and (amount of actin)=0.42*CLOGP-0.79 (n=7, r=0.99). Based on these studies, we designed a novel hydrophilic polyethyleneglycol (PEG) spacer for the conjugation of ligands to chromatography resins. As predicted by our binding algorithm, introduction of this spacer reduced the amount of non-specific protein binding in proportion to number of ethylene glycol units