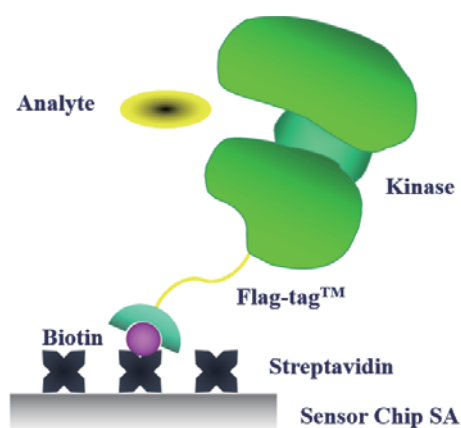


A story about biotin-avidin affinity and how it accelerates small molecule drug discovery

Biotin is a type of water-soluble vitamin, also called vitamin B7. Although it's an essential substance for all species, only bacteria, yeast, mold, algae and certain plants are capable of producing it, leaving the mammalian species dependent on external sources. Did you know that biotin deficiency attributes to congenital and/or nutritional abnormalities and tends to cause brittle nails, loss of appetite, hair loss and predisposition to skin infection? Affinity between biotin and avidin is said to be a million-fold stronger than an antigen-antibody interaction. If you consume a large amount of raw egg white containing a lot of avidin, the strong avidin-biotin reaction prevents absorption of biotin in your system, resulting in serious biotin deficiency. Streptavidin, which has a similar structure to avidin, exhibits the same strong affinity to biotin, while its characteristics result in much less nonspecific binding.

The strong binding between streptavidin and biotin is an invaluable asset widely utilized in biochemical experiments for many applications. One major example is its use in evaluation of intermolecular interactions based on the surface plasmon resonance (SPR) detection principle. Biacore AB Corporation (presently GE healthcare) was the first company to develop SPR measuring instrumentation. A simple interaction experiment involves immobilizing one molecule of a binding pair ("ligand") on the sensor chip surface and injecting a series of concentrations of its partner ("analyte") across the surface (see figure). Changes in the refractive index at the surface where the binding occurs are detected. Real time monitoring of association and dissociation between two binding partners generates analytical data for kinetics and affinity of molecular interaction. If your ligand is a protein, it's advisable to choose a biotinylated protein as it will make your immobilization of a ligand onto a streptavidin covalently-attached sensor chip much easier with stronger affinity.

This advantageous mechanism is also useful for FRET, ELISA, and AlphaScreen technology (Perkin Elmer). In addition, biotin's smaller molecular weight, compared to other tags such as GST and MBP, makes it less prone to interfere with ligand-analyte interaction, ultimately leading to higher detection sensitivity.



Knowing the key role biotin has played in biochemical experiments, we invite you to join the many customers who utilize Carna's biologically produced biotinylated protein kinases. These exclusive products have a single biotin attached to the N-terminus and >80% guaranteed purity, and will save you time and expense when establishing key binding experiments. Our biotinylated kinases allow you to generate more reliable data with low background leading to better understanding your small molecules. Our biotinylated kinases have kinome-wide representation of many important targets implicated in oncology, inflammation and neurological disease where discovery of selective and potent drug candidates is critical.

You can check detailed individual data about each Carna biotinylated kinase at our [web site](#) or our [E-shop](#). For more information, please don't hesitate to [contact us](#).