

another approach that could be useful when only small amounts of sample are available and information on several clinical analytes is desired. Scheme for a theophylline flow-based simultaneous injection competitive binding immunoassay, using a label that consists of liposomes impregnated with carboxyfluorescein as a fluorescent marker. Other clinical analytes that have been measured by simultaneous injection competitive binding immunoassays include human chorionic gonadotropin (60), thyroid-stimulating hormone (60), HSA (61), IgG (62, 63), testosterone (64), and transferrin (61, 65); additional studies with theophylline have also been reported (66+–69). Other labels that have been reported include fluorescent tags such as fluorescein, Texas red, or lucifer yellow; chemiluminescent labels based on acridinium esters; and liposomes impregnated with fluorescent dye molecules (5). The easiest approach is to mix the sample with a labeled analyte analog (i.e., the label) and to inject the mixture simultaneously onto an immunoaffinity column that contains a relatively small amount of antibody. The detection of these labels generally is performed on line as they elute in the nonretained or retained peaks of the immunoaffinity column; however, fraction collection and off-line detection can also be used when required. 6, in which theophylline was measured in serum by a flow-injection competitive binding immunoassay that used carboxyfluorescein-impregnated liposomes as the label. S-Octylglutathione has been reported as a ligand for the separation and analysis of glutathione S-transferase isoenzymes in human lung and liver samples (52, 53). Chromatographic Immunoassays One relatively new area of affinity chromatography that has received increasing attention in recent years has been the use of both low- and high-performance immunoaffinity columns to perform various types of immunoassays. 6