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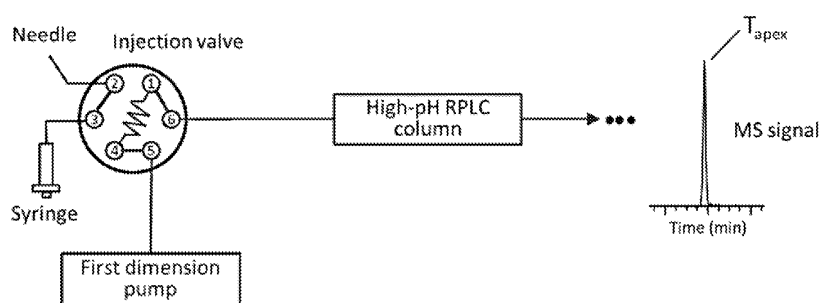


Fig. 2

(57) Abstract: The present application relates to systems and methods for assaying presence of large molecule analytes, such as proteins, e.g., antibodies, antigens, receptors, and the like, using a targeted two-dimensional liquid chromatography, tandem mass spectrometry (2D-LC-MS/MS) system, optionally combined with affinity capture. In some aspects, the system is partially or fully automated. In some aspects, the system may allow detection of protein biomarkers (e.g., antibodies or antigens) from clinical or nonclinical biological tissue or fluid samples in the pg/mL to ng/mL range.

