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(54) **Title**: METHODS FOR IMPROVING THE DESIGN, BIOAVAILABILITY, AND EFFICACY OF RANDOM SEQUENCE POLYMER COMPOSITIONS VIA SERUM PROTEIN-BASED DETECTION OF RANDOM SEQUENCE POLYMER COMPOSITIONS

(57) **Abstract**: There exist in the art methods of detecting simple peptides. However, methods to determine the effective plasma concentration of mixtures of peptides as a group, rather than for individual peptides with a defined amino acid sequence, are complicated by the heterogeneity of the peptides to be detected. This application provides improved methods of detecting and assessing random sequence polymer (RSP) compositions, methods for the detection and quantitation of RSP compositions, means to determine and enrich a subset of peptides in an RSP composition based on the subset's interactions with certain capture polypeptides, and methods for administering RSP compositions to a subject in need thereof, wherein the dosage regimen and quantity may be determined or evaluated based on the above-mentioned methods for detection and quantitation.