

Serum protein electrophoresis (SPEP or SPE) is a laboratory test that examines specific proteins in the blood called globulins. The most common indications for a serum protein electrophoresis test are to diagnose or monitor multiple myeloma, a monoclonal gammopathy of uncertain significance (MGUS), or further investigate a discrepancy between a low albumin and a relatively high total protein. Unexplained bone pain, anemia, proteinuria, renal insufficiency, and hypercalcemia are also signs of multiple myeloma, and indications for SPE.

Blood must first be collected, usually into an airtight vial or syringe. Electrophoresis is a laboratory technique in which the blood serum (the fluid portion of the blood after the blood has clotted) is applied to an acetate membrane soaked in a liquid buffer, to a buffered agarose gel matrix, or into liquid in a capillary tube, and exposed to an electric current to separate the serum protein components into five major fractions by size and electrical charge: serum albumin, alpha-1 globulins, alpha-2 globulins, beta 1 and 2 globulins, and gamma globulins.

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Last update: **2024/06/07 02:50**

