Protein

General:

The total protein fraction of plasma consists of >100 known proteins. Albumin, α1-, α2- and β-globulins are synthesized in the liver, the proteins of gamma-globulin by plasma cells.

The following tests are available:

- **Protein total, in serum**

Indication:	Increased ESR, proteinuria, edema, polyuria, chronic kidney and liver diseases, diarrheas, trauma, shock, burn injuries, malnutrition.
Material:	1 ml serum
Stability:	1 month at 2 to 8°C
TAT:	same day, FML
Method:	photometry
Units:	g/dl
Ref.- range:	see report
Note:	standing: up to 10% protein concentration increase (orthostasis)

- **Protein total, in urine**

General:

Proteinuria is the leading symptom of kidney disorders. Most kidney disorders show selective or non-selective multi-secretion of plasma proteins. The level of proteinuria correlates with the extent of kidney damage (exception: Minimal-Changes-Nephritis).

Material:	10 ml urine
Preanalytics:	24-hours collected urine, please indicate quantity
Stability:	7 days at 2 to 8°C
TAT:	same day, FML
Method:	turbidimetry
Units:	mg/24h
Ref.- range:	28 - 141
Note:	Please note that bacterial growth in 24h urine is a common cause of increased protein values. Please store at cool temperature (4-8 degrees celsius)

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^ non-accredited parameter
*performed in a collaborating laboratory (Germany)

- **Protein total, in CSF**

General:

CSF protein concentration is - given a normal blood/CSF barrier - approx. 1/80 to 1/100 of the serum concentration. About 80% of the physiological CSF proteins originate from blood, whereby the smaller proteins such as albumin, acidic α1-antitrypsin, hemopexin, α2-glycoprotein and transferrin dominate. Proteins of brain tissue, e.g. prealbumin, are detectable only in traces under 0.05 and have no diagnostic significance. The protein percentage in CSF increases during barrier disturbances. Immunoglobulins can be locally produced (multiple sclerosis *see* **Immunofixation** for oligoclonal bands!). The blood/CSF barrier of the newborn is more permeable than that of the adult.

Indication: meningitis, suspicion of multiple sclerosis
Material: 1 ml CSF
Stability: 7 days at 2 to 8°C
TAT: same day, FML
Method: turbidimetry
Units: mg/24h
Ref.- range: 15-45

- **Protein total, in dialysate^**

Material: 2 ml dialysate
TAT: same day, FML
Method: photometry

- **Protein total, in aspirate^**

Material: 2 ml aspirate
TAT: same day, FML
Method: photometry

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- **Protein electrophoresis**

Indication: Diagnosis of dysproteinemia, diagnosis and follow up of inflammatory reactions, malignant tumors, protein loss syndromes, antibody deficiency, suspicion of monoclonal gammopathy, protein malnutrition.

Preanalytics: 1 ml serum, 1 ml whole blood, 10 ml urine, 3 ml CSF, no plasma, no EDTA plasma or heparin blood

Material: different body fluids to be examined (serum, whole blood, urine, CSF see below)

TAT: 5-7 days*

Method: electrophoresis

Units: relative %age

disorder	albumin	alpha1-globulins	alpha2-globulins	beta-globulins	gamma-globulins
acute infection	decreased	increased	increased	increased*	-
burn injuries	decreased	increased	increased	-	increased
chronic infection	decreased	-	increased*	-	increased
carcinoma	decreased	increased*	increased	-	increased*
malignant lymphoma	decreased	-	increased*	-	increased
chronic aggressive hepatitis	decreased	-	degraded	-	increased
hepatic cirrhosis	decreased	-	-	-	increased
obstruction of the biliary tract	-	-	increased	increased	-
nephrotic syndrome	decreased	increased	increased	increased	-
plasmocytoma	decreased	M	M	M	M
pregnancy	decreased	increased	increased	increased	-

* : increased some of the cases;

M : M gradient in the range of the globulins;

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- : unchanged.

In the individual fractions the following proteins are found

alpha-1-globulins:	alpha-2-globulins:	beta-globulins:	gamma-globulins:
a-1-lipoprotein (HDL) a-1-glycoprotein a-1-antitrypsin	a-2-macroglobulin haptoglobin pre-b-lipoprotein	transferrin, LDL, complement components	immunoglobulins G, A, M, D, E

- **Protein SDS electrophoresis in urine**

Material: 10 ml urine
TAT: 7-10 days*
Method: electrophoresis

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit http://www.fml-dubai.com/parameter-listings/

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