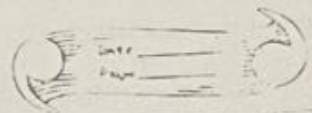


# Albumin



## ① Dye Binding method:

- ↓
- shift of absorbance spectrum
- affinity of some dye for Alb is high.

PI of albumin  $\rightarrow$  4.7

So at pH  $\rightarrow$  Albumin at 4.2  $\rightarrow$   
albumin +ve charge

↓  
Bca at 4.2 pH  $\rightarrow$  -vely charge

↓  
Binds +vely charge Albumin at  
specific region

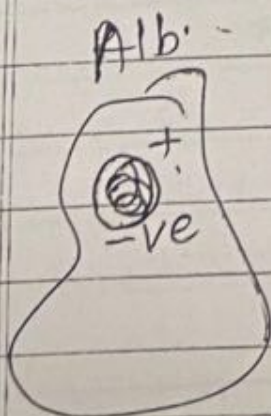
2 Dyes : Bca & BCP

$\rightarrow$  when composi

$\rightarrow$  Dye binding method

$\rightarrow$  Cisthoad's pt  $\rightarrow$  Dye binding method less accurate

↓  
due to oxidized Alb.



denatased  $\rightarrow$  may be Bca site Blocked

$\rightarrow$  Bl. site is facilitate.



12  
↓  
→ Alb binds to  $Ca^{+2}$

↓  
Corrected  $Ca^{+2}$  should be done

→ ~~Maintain~~ Monitoring of Renal failure

↓  
Guideline ask for maintaining  
4 gm% Alb level by dye binding  
method

→ low Alb : outcom<sup>ne</sup> chronic hemolysis is  
poor.

→ Alb. level ↔ for measuring quality of  
pt care unit.

→ S. Alb also using for staging of  
multiple myeloma

↓  
> 3.5 gm/dl → good prognosis

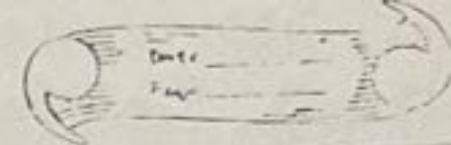
→ Ref. method :-

Immunoturbidimetry

→ many drug to binds to Alb

↓  
Sometimes may interfere to  
binding of dye.





→ Alb in Ascitic fluid



degradat<sup>n</sup> on Albumin due to protease



C may cause ↑ binding of dye.



\* Electrophoresis :-

Densitometry :-

By 2 principles

Refractometry

Ab transmittance.

not good idea for measurement of Albumin



# Microalbuminuria

30-300mg/day/Albumin

→ Protein in urine → (b) very less

→ Protein

↓  
Tubular

↓  
glomerular

↓  
overflow

↓  
Excessive  
amount of LMW  
protein ↓

reabsorptive capacity  
exceeds.

- BJ protein
- myoglobin

→ By pyrogallol red → TP is ~~used~~ <sup>measured</sup>  
not Alb.

~~met~~

→ CLS :-

→ Proteinuria

Albuminuria

- Favoured by most  
guideline. or

HT      DM

→ (h) urinary excretion → < 30 mg/d.

→ ↑ in alb → nt generally  
detected by measurement  
of TP

↓

B'cz of low-sensitivity of  
measurement of TP.



not in lysosome ← Lysozyme : Myraminidase / N-acetyl muramid glycanhydrolase  
↑  
+nt in urin, tear, saliva  
↓  
freely filtered in urin

→ changes in Alb ~~at~~ excre<sup>n</sup>

↓  
overall changes in ~~glomerular~~ vascular permeability → may not, explicit "deteriora<sup>n</sup>" in renal function.

→ Tubules :- reabsorption By pinocytosis  
↳ damage By cytotoxic drugs.

Tamm-Horsfall glycoprotein

↓  
protein +nt in urinary tract.

→ Microalbuminuria :

↓  
genesally available method can't detect it. (like pyrogallol red, Biuret, strip method)

- 20 to 200 mg/L (2 to 20 mg/dL)

→ It is used in monitoring of HT & DM

→ early marker of damage

↓  
So intervention can be applied

↓  
damage can be reversed.

Preanalytical variable

- ① Infection
- ② DM under control
- ③ other illness.
- ④ menstrual contamination
- ⑤ vaginal d'ge
- ⑥ UTI
- ⑦ CHF
- ⑧ uncontrolled HT
- ⑨ strenuous exercise



\* Guideline :-

- Type I : 5 yrs after ASIs
- Type II : immediately after ASIs

↓

→ Repeat annually,

→ early morning, midstream urine sample should be used,

→ Microalbuminuria <sup>detected</sup> should start Rx  $\bar{c}$  ACE / ARB

↓

→ ↓ the rate of declining GFR (HT)

→ Normotensive Microalbuminuria :

↓

should be start  $\bar{c}$  ACE

→ Established microalbuminuria → irreversible nephropathy

→ 7% → ⑥ individual  $\bar{c}$  no HT & DM have microalbuminuria. → Don't start

→ Some study suggest even lower cutoff  $< 30 \text{ mg/dl}$

↓

relationship B/w normal range microalbuminuria & morbidity & mortality

→ observe urine → Hematuria has there or not → during ACR report ~~report~~ interpret.

→ Microalbuminuria <sup>\*</sup> → in classification on eKD



### \* Sample collection:

- 24 hrs urine TPA<sup>Alb</sup> → definitive } timed
  - oversight → TPA<sup>Alb</sup>
  - 1st void → TP & Alb. } Spot
  - 2nd void → TP & Alb. } Spot
  - random → TP & Alb. } Spot
- less effect of orthostatic proteinuria.
- ratio of TP/osmolality  
Alb/osmolality

- Protein/Creat → swelling out test  
rather than swelling in test
- ↓ +ve
- Then do 24-hrs collection

- Orthostatic proteinuria:
- ↓
- perform early morning sample

### \* TP methods in urine: —

- ① TCA & sulfosalicylic acid
- ② Turbidimetry & benzatholiumchloride
- ③ CBB & Pyrogallol red — dye binding

### \* Reference Range: —

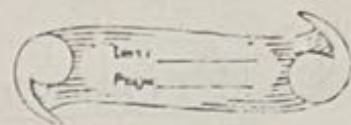
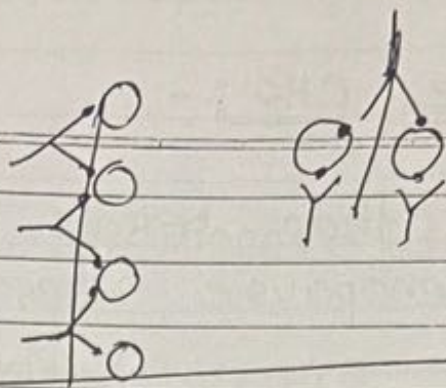
- conc. TP in urine → 150 mg/day
- conc. Alb " → 230 mg/day

- LMW protein in urine → Tamm-Horsfall protein.









\* → Alb: method in Urin :-

① Immuno-turbidimetric / nephelometric →

↓

- lower limit detect<sup>n</sup> : 0.5 mg/dl

- Ref. rang of Alb. in (h) : < 3 mg/dl.

→ Urinary Alb : standardize against serum based calibrator

↓

calibrator for U. Alb

Then for making 100 times dilution should be done.

→ Alb → Undergo polymerization & degradation on storage

↓

So may be new site for dye binding may ↑/↓

→ may make them <sup>NOT</sup> immuno reactive