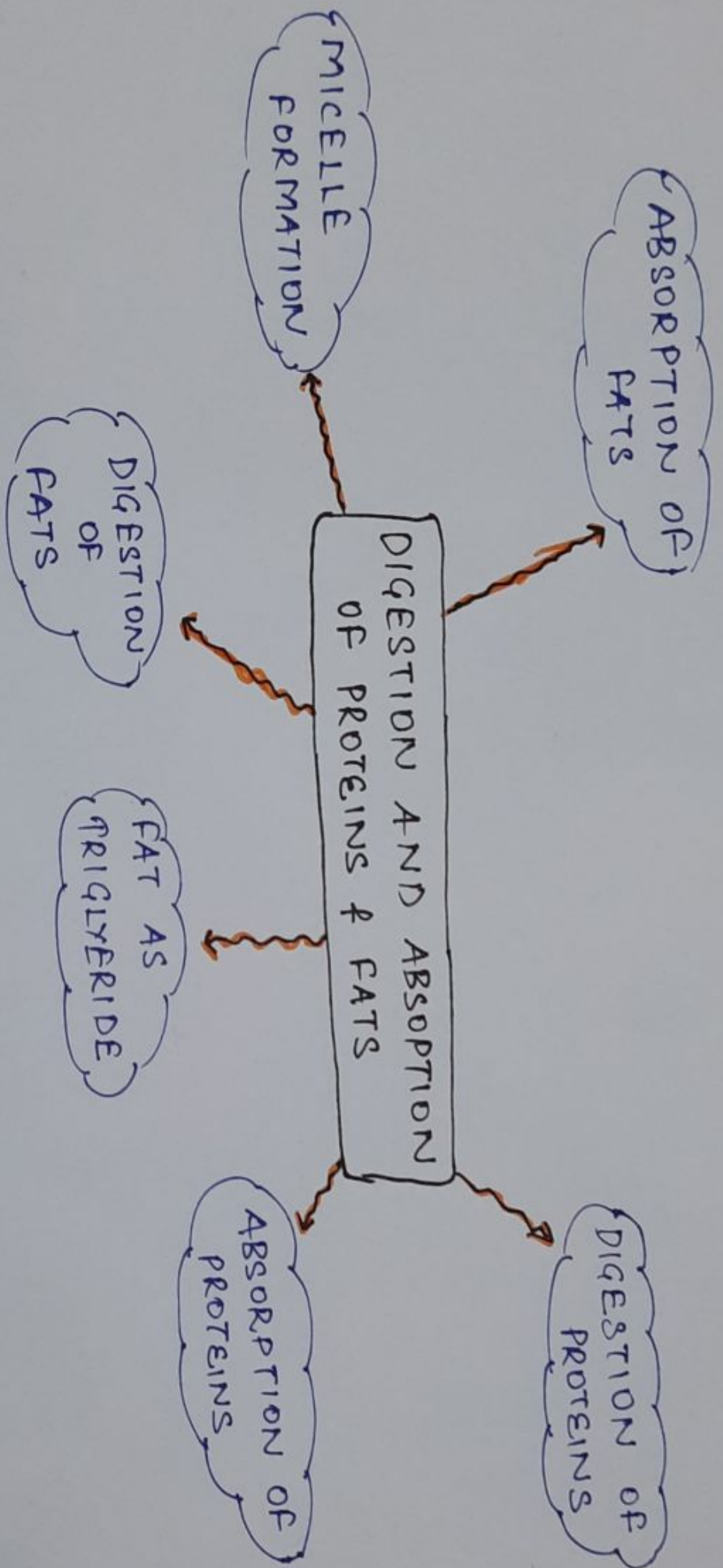




DIGESTION OF PROTEINS

IN STOMACH:-

ENZYME:- Pepsin [ACTIVE IN ACIDIC pH:- 2.0-3.0]
(INACTIVE >5.0)

ACTION:- PROTEINS
(10-20%)

PEPSIN →
• PEPTOSSES
• PEPTONES
• POLYPEPTIDES

↓ HCL RELEASED HAVE
PH OF 0.8. BUT WHEN
MIXES WITH GASTRIC
JUICES BECOMES 2.0-3.0

FORMS
INTERCELLULAR
CONNECTIVE
TISSUE OF MEAT

COLLAGEN IN MEAT → PEPsin → DIGEST

IN DUODENUM (PANCREATIC SECRETIONS):-

ENZYME:- TRYPsin, CHYMOTRYPsin, CARBOXYPOLYPEPTIDASE, PROELASTASE
ACTION:- PROTEINS
(80-90%)

TRYPsin
CHYMOTRYPsin →
• PEPTOSSES
• PEPTONES
• POLYPEPTIDES

POLYPEPTIDES → CARBOXYPOLYPEPTIDASE → AA + POLYPEPTIDES

ELASTIN → PROELASTASE → DIGEST
↓
ELASTASE

→ ONLY SMALL % OF PROTEINS ARE DIGESTED ALL WAY TO THEIR CONSTITUENT AA BY PANCREATIC JUICES. MOST REMAIN AS **DIPEPTIDES** AND **TRYPEPTIDES**.

IN SMALL INTESTINE (DUODENUM & JEJUNUM) - VILLI

VILLI



BRUSH BORDER



MICROVILLI



MULTIPLE PEPTIDASE PROTRUDE THROUGH MEMBRANE OF MICROVILLI TO EXTERIOR

ENZYMES :- AMINOPOLYPEPTIDASE

ACTION :- POLYPEPTIDES

→ DIPEPTIDES
TRYPEPTIDES
AMINO ACID

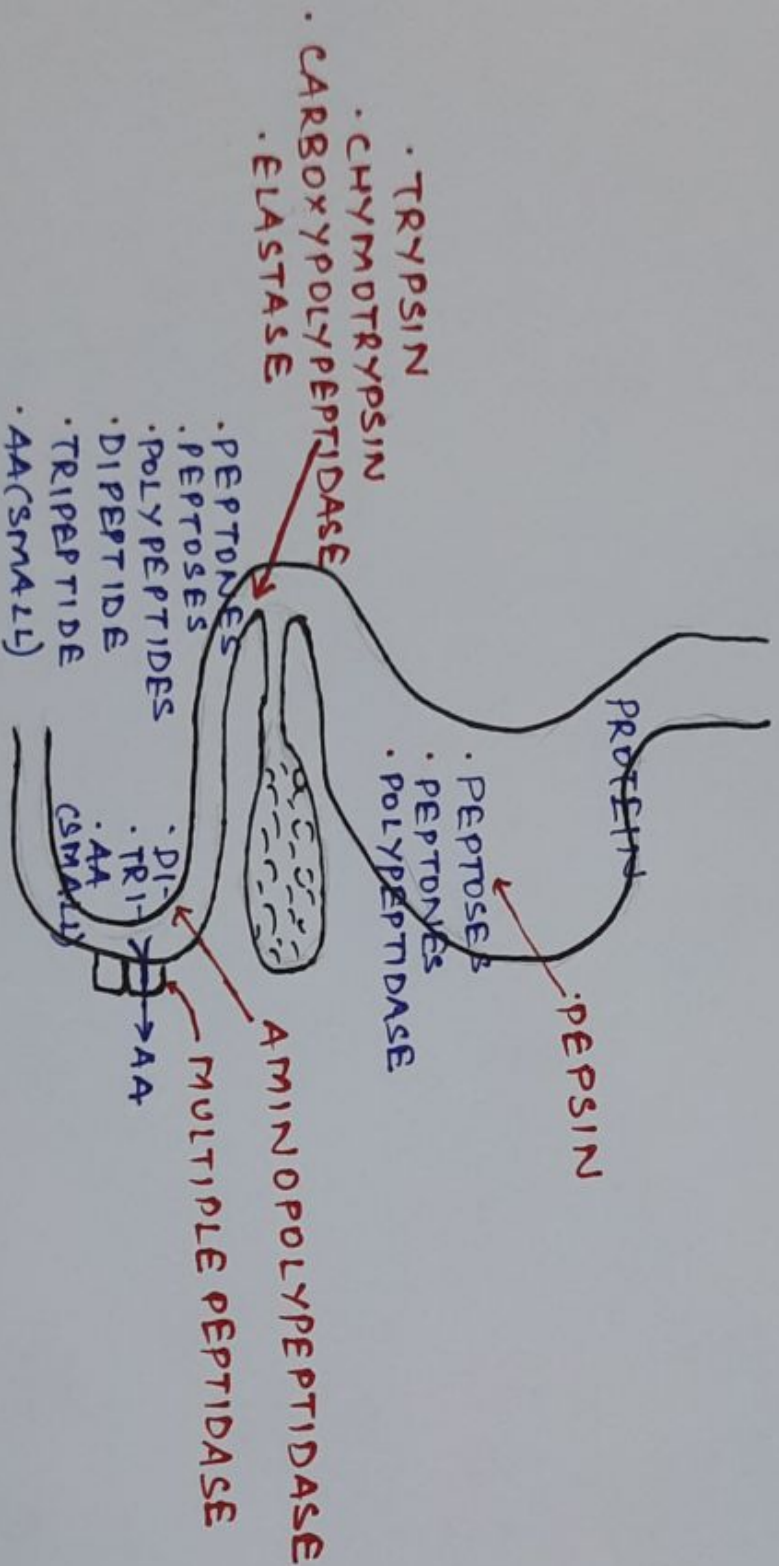
NOTE:- THE AA, DIPEPTIDES, TRYPEPTIDES ARE EASILY TRANSPORTED THROUGH MICROVILLAR MEMBRANE TO INTERIOR OF ENTEROCYTE

IN CYTOSOL OF ENTEROCYTES

ENZYME :- MULTIPLE PEPTIDASE

ACTION :- DIPEPTIDES
TRIPEPTIDES

AA
[PASS TO OTHER SIDE OF
ENTEROCYTE AND THENCE
TO BLOOD]

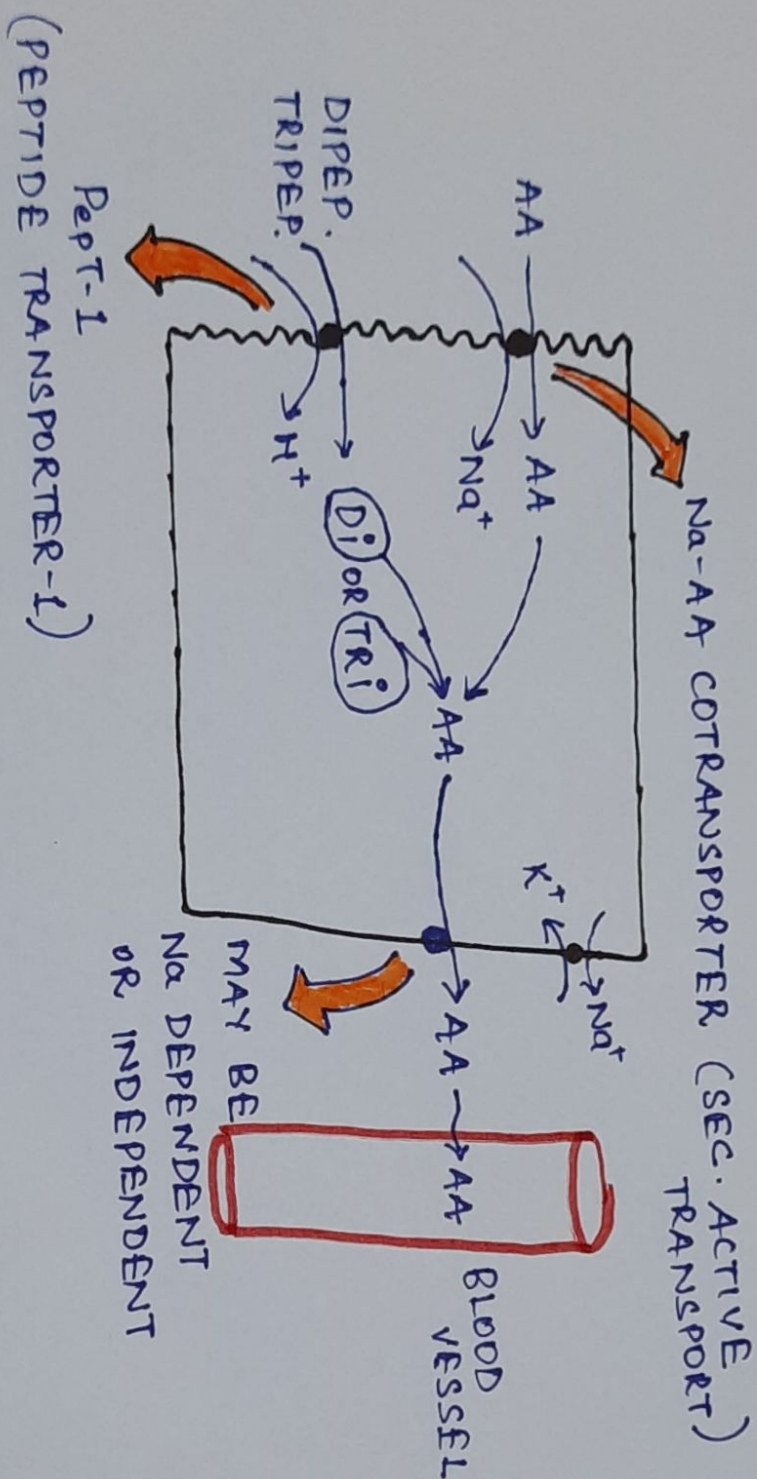


ABSORPTION OF PROTEINS

- AS DIPEPTIDES, TRIPEPTIDES AND AA (FEW)

- BY • Na-AA COTRANSPORTER

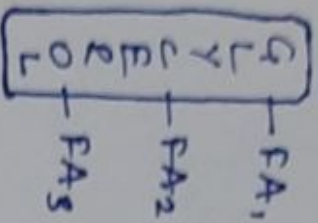
• PEPT-1



FAT AS TRIGLYCERIDE :-

⇒ ALMOST ENTIRE FAT PORTION OF DIET IS TRIGLYCERIDE

TRIGLYCERIDES → 3 FA + GLYCEROL
(NEUTRAL FAT)



DIGESTION OF FATS :-

FATS IN DIET

- TRIGLYCERIDE (NEUTRAL FAT) :- → MAJOR COMPONENT
- PHOSPHOLIPID (CONTAINS FA)
- CHOLESTEROL ESTERS (CONTAIN FA)
- CHOLESTEROL (NO FA)
 - PHYSICAL & CHEMICAL PROPERTIES OF FATS
 - DERIVED FROM FAT & METABOLIZED AS FATS
 - CONSIDERED AS FATS

FAT DIGESTION IN MOUTH & STOMACH :-

MOUTH

ENZYME :- LINGUAL LIPASE

ACTION :- < 10% DIGESTION OF T.G.

STOMACH

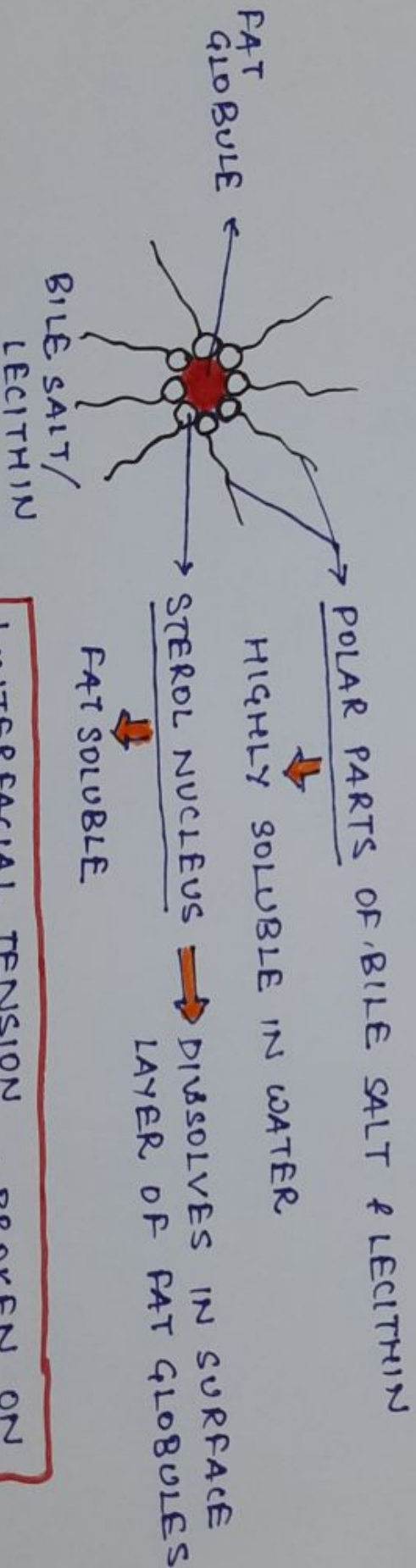
ENZYME :- GASTRIC LIPASE (FUNDUS AREA)

ACTION :- < 10% DIGESTION OF T.G.

IN DUODENUM :-

EMULSIFICATION OF FAT -

- BREAKING FAT GLOBULES TO SMALL SIZES SO THAT WATER SOLUBLE ENZYMES CAN ACT ON GLOBULE SURFACES.
- DONE BY BILE SALTS AND LECITHIN



↓ INTERFACIAL TENSION
OF FAT GLOBULE → BROKEN ON
AGITATION

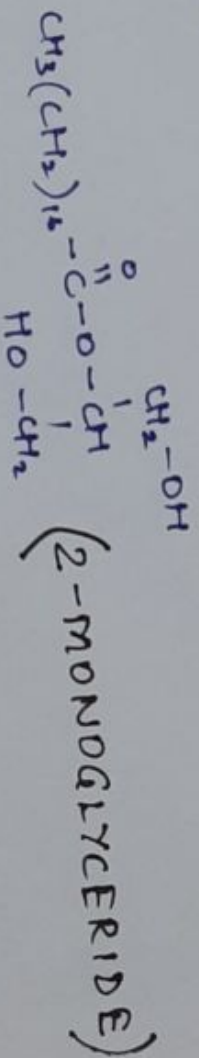
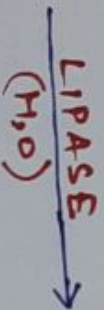
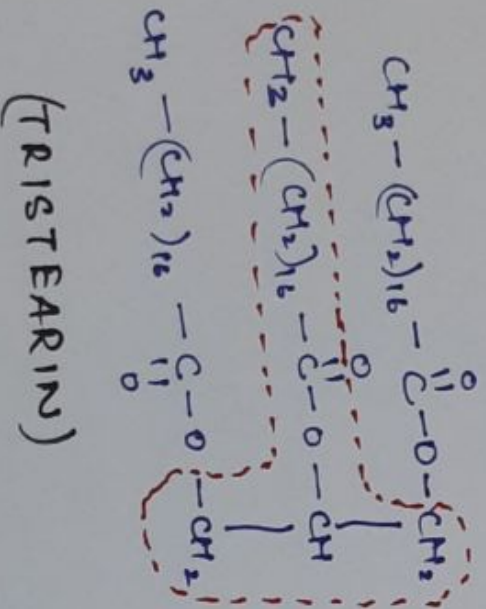
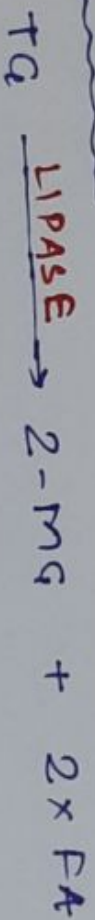
IN PANCREAS :-

ENZYME :- PANCREATIC LIPASE
ACTION :- TG $\xrightarrow{\text{(ALL)}}$ MG + GLYCEROL

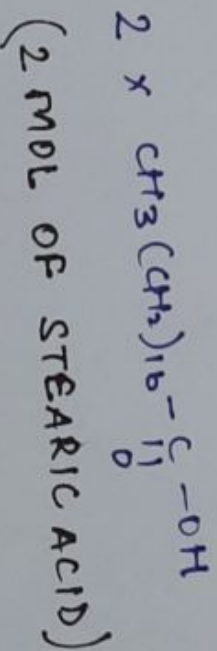
IN INTESTINE :-

ENZYME :- ENTERIC LIPASE
NO SIGNIFICANT ACTION

END PRODUCT :-



+



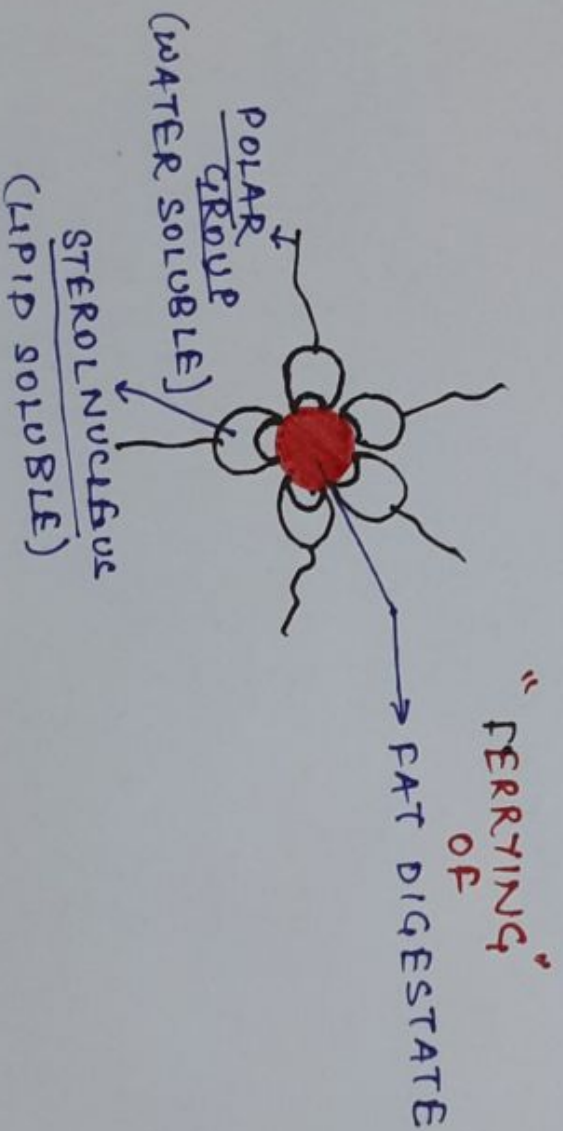
MICELLE FORMATION

WHY? :-

- HYDROLYSIS OF TRIGLYCERIDE IS HIGHLY REVERSIBLE PROCESS.
- ACCUMULATION OF MG AND FREE FA IN VICINITY OF DIGESTING FATS QUICKLY BLOCKS FURTHER DIGESTION.
- BILE SALTS FORMS MICELLES TO PREVENT SUCH THINGS
- MICELLES ALSO HELPS IN TRANSPORT OF MG & FA INTO INTESTINAL EPITHELIAL CELLS.

WHAT ARE MICELLES

- ?
- SMALL, SPHERICAL, CYLINDRICAL GLOBULES, 3-6 nm IN DIAMETER COMPOSED OF 20-40 MOLECULES OF BILE SALT



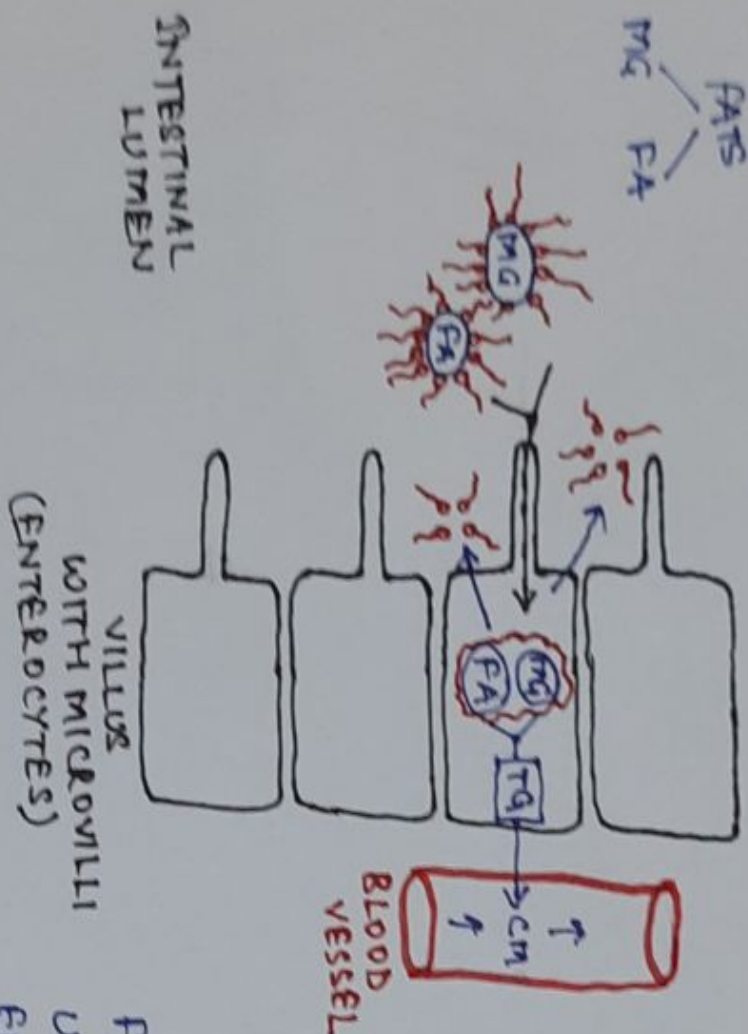
ABSORPTION OF FATS

FATS $\xrightarrow{\text{DIGESTION}}$ $2 \cdot \text{MG} + 2 \times \text{FA}$ (TG)

FERRYING

$\rightarrow$ MICELLE FORMATION

[FERRYING $\oplus \Rightarrow$ 97% FAT ABSORBED
FERRYING $\ominus \Rightarrow$ 40-50% FAT ABSORBED]



MG. AND FA. ALONG WITH MICELLE CARRIED TO SURFACES OF MICROVILLI

$\downarrow$

MG. AND FA. DIFFUSE IMMEDIATELY OUT OF MICELLES, INTO INTERIOR OF EPITHELIAL CELLS

FA & MG TAKEN UP BY SMOOTH ENDOPLASMIC RETICULUM

MICELLES LEFT IN CHYME TO BE ASSOCIATED WITH OTHER FA & MG

TO BLOOD AND LYMPHATICS $\leftarrow$

RELEASED IN FORM OF CHYLOMICRONS THROUGH BASE OF CELL

$\leftarrow$ NEW TRIGLYCERIDES FORMED