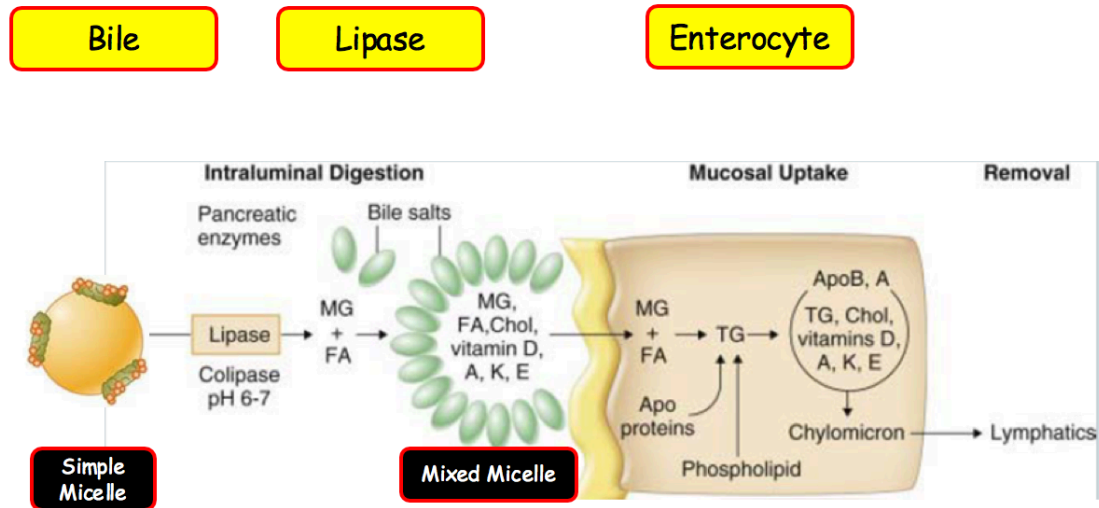
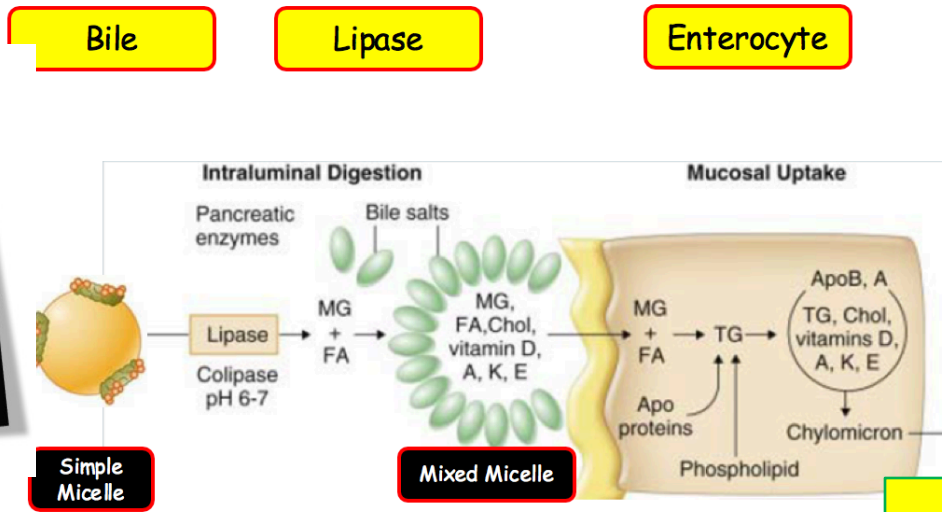


Podcast (Video Recorded Lecture Series):
Chylomicron Formation and Fat Absorption for the USMLE Step One Exam



Howard J. Sachs, MD
www.12DaysinMarch.com
Email: Howard@12daysinmarch.com

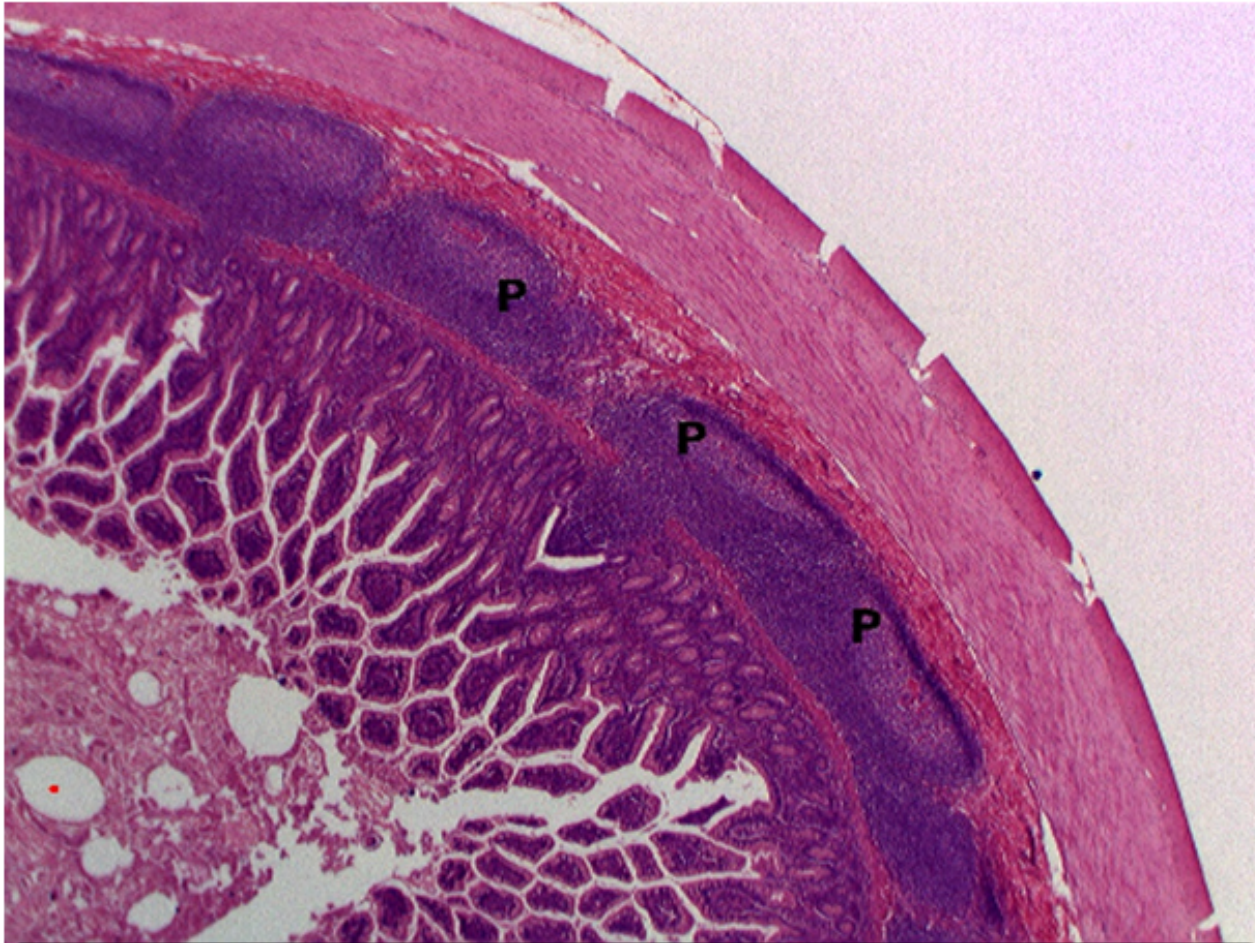
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12DaysinMarch

Tutorial Services
(check website for details)

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GI Lymphatics: WYNTKFTB

Lipid Absorption

M-cells/Peyer's Patches

Lymphatics/Lymphoid Tissue

- Lymph flow from the GI tract ends at the thoracic duct (→ subclavian/IJ).
 - Passes through preaortic LN (celiac/mesenteric)
 - Obstruction (chylothorax) in mediastinum (e.g. lymphoma)
 - **Chylomicrons** travel into lymphatics from enterocyte.
- Peyer's Patches (GALT; gut-associated lymphoid tissue)
 - Sample antigen (M Cells; microfold) in lumen and present to dendritic (Ag-presenting) cells.
 - CC: Salmonella, Yersinia, Shigella all invade/infect via M-cell

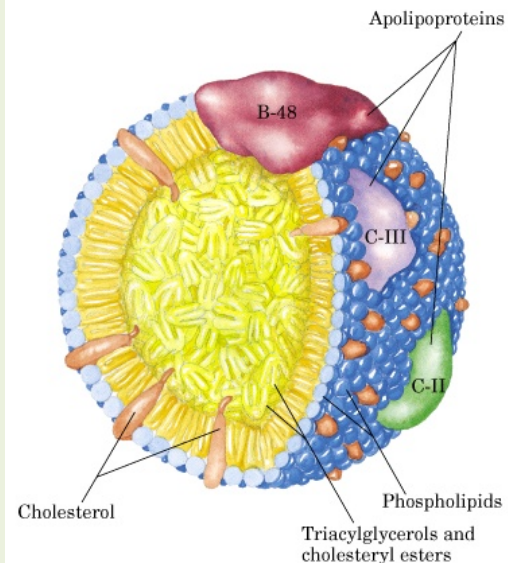
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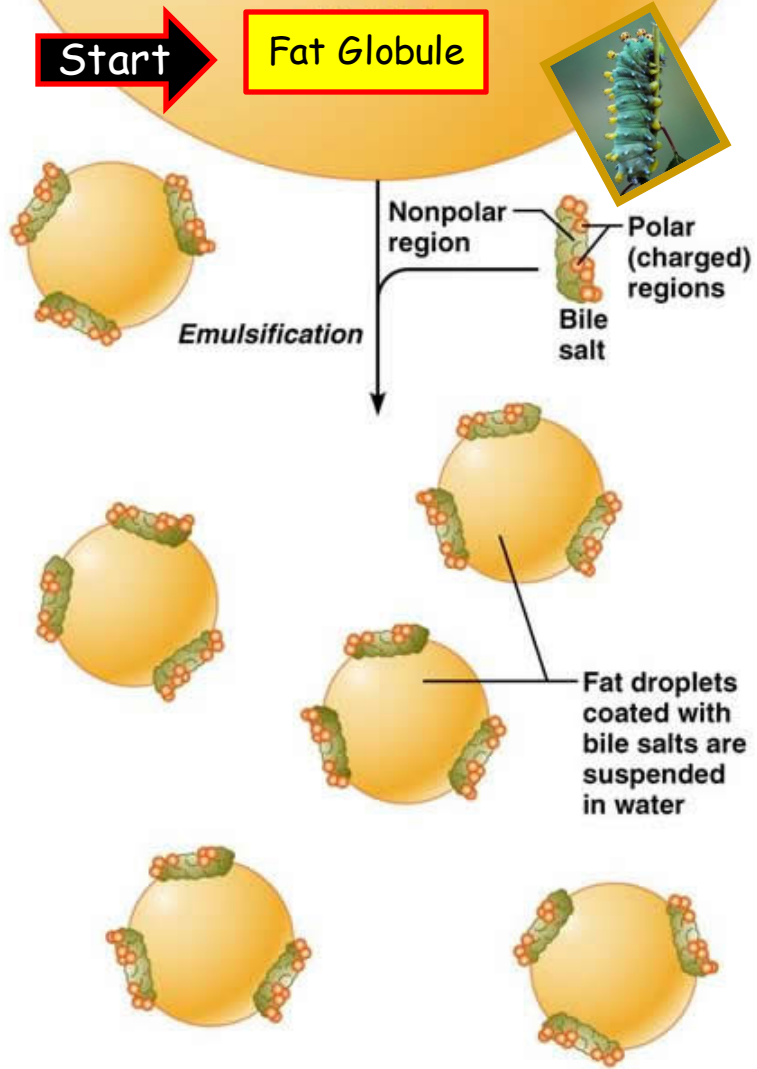
• What is a Chylomicron?

(too big to enter capillary)

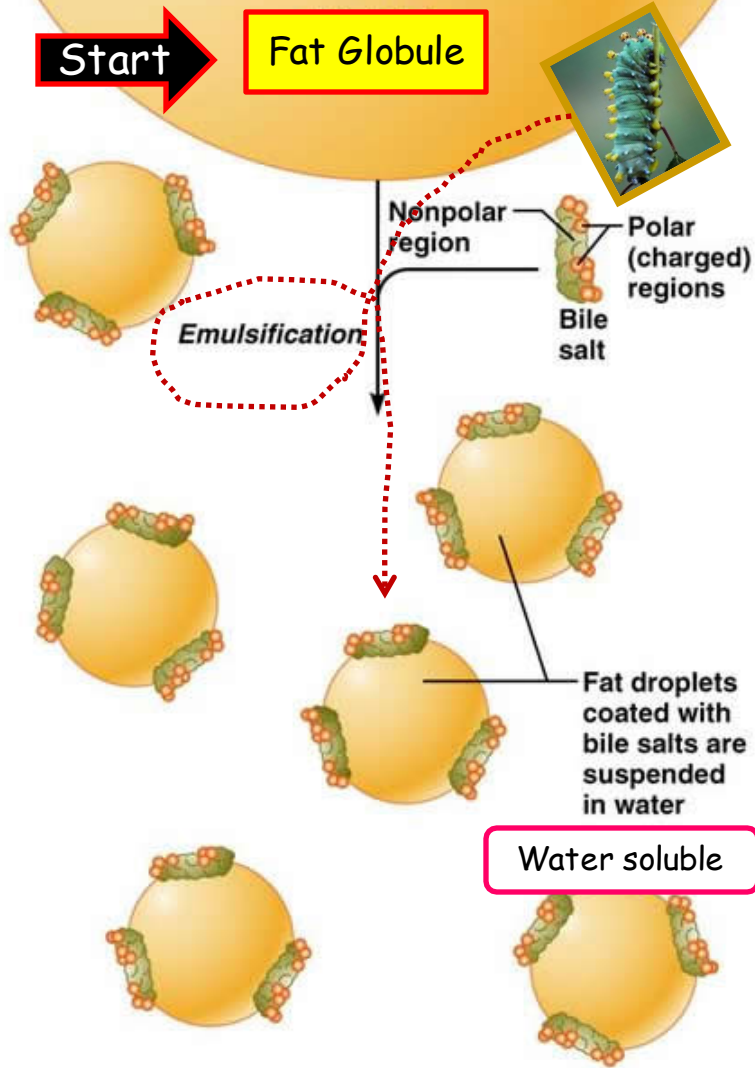
...let's make one



Emulsified into Simple Micelles:
Bile Salts plus fat droplets

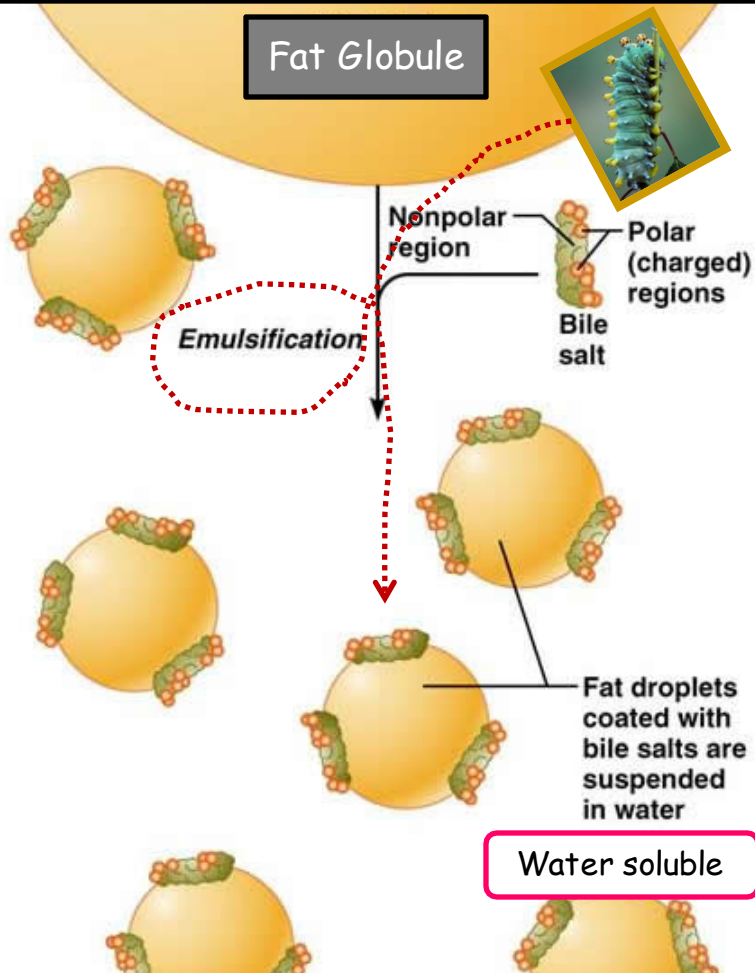


Emulsified into Simple Micelles:
Bile Salts plus fat droplets



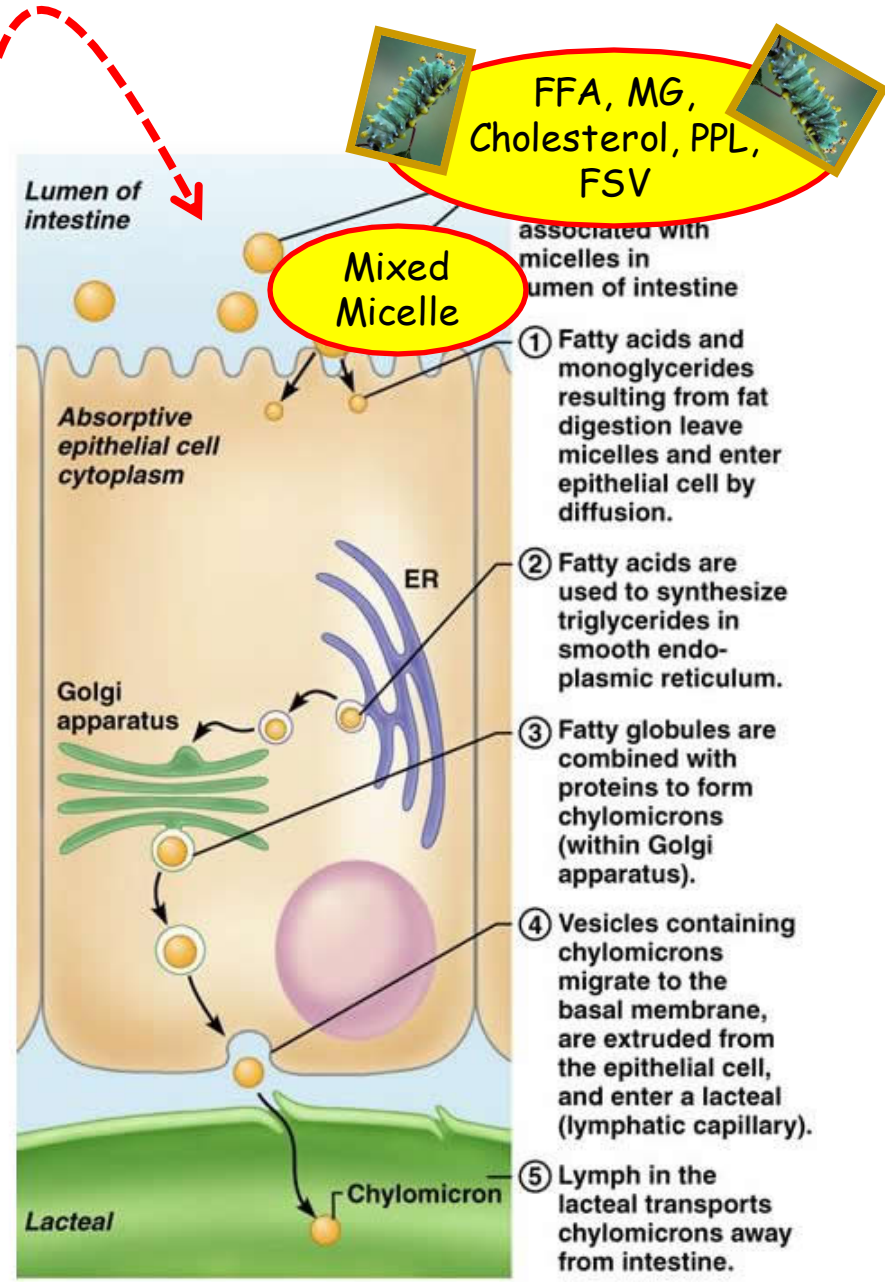
We just made a simple micelle...yay!

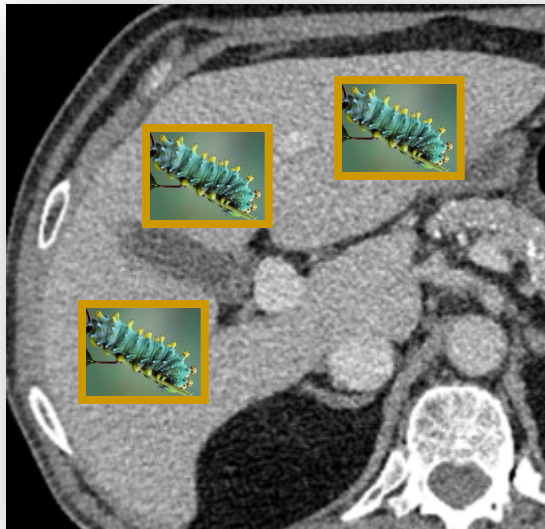
Emulsified into Simple Micelles:
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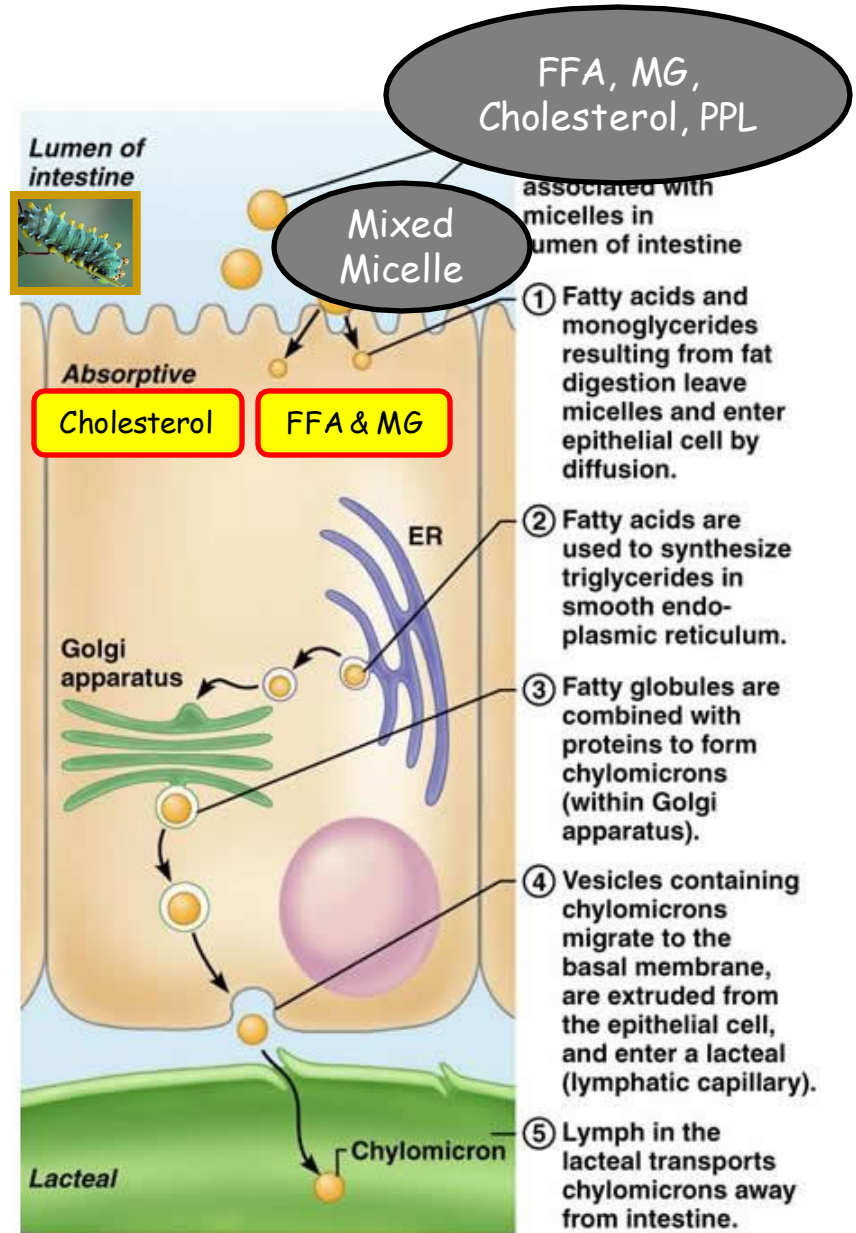
Water soluble

- In setting of pancreatic
- (Co)lipase
 - PLA₂
 - Cholesterol esterase

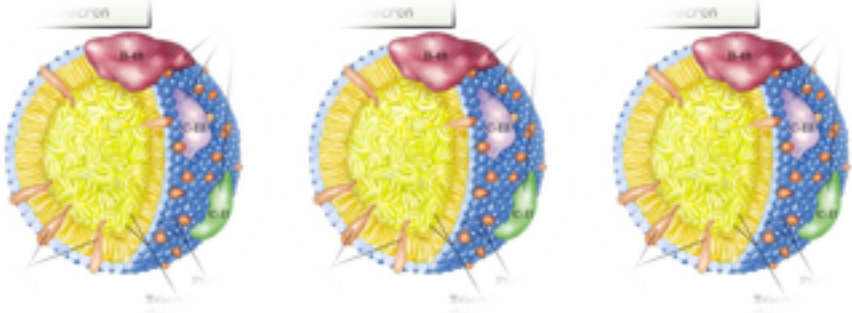
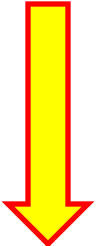




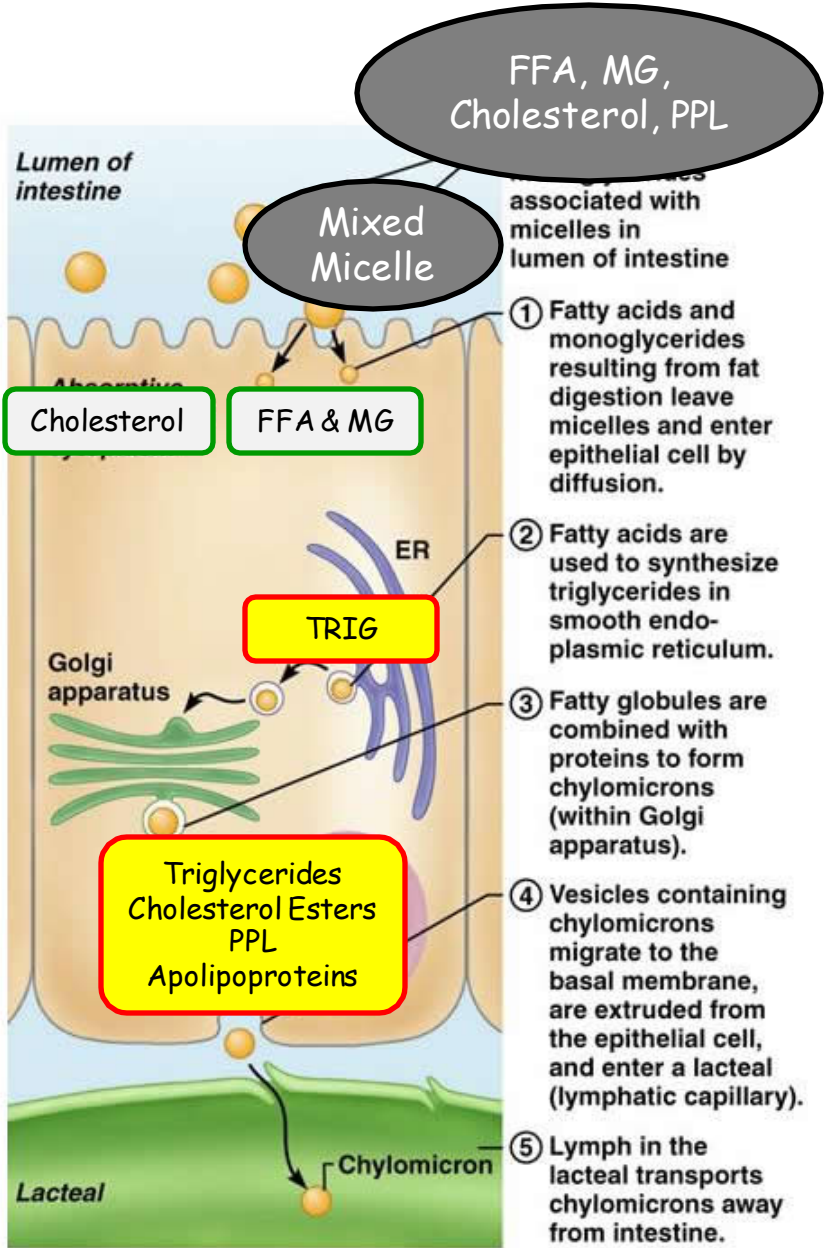
Enterohepatic circulation



Reconstituted in ER (Trig)
Golgi: combine PPL, Chol & Apo

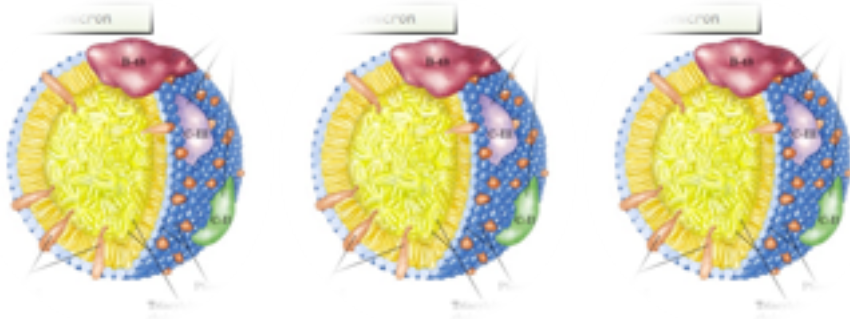


Chylomicrons





Thoughts to ponder?



Chylomicrons

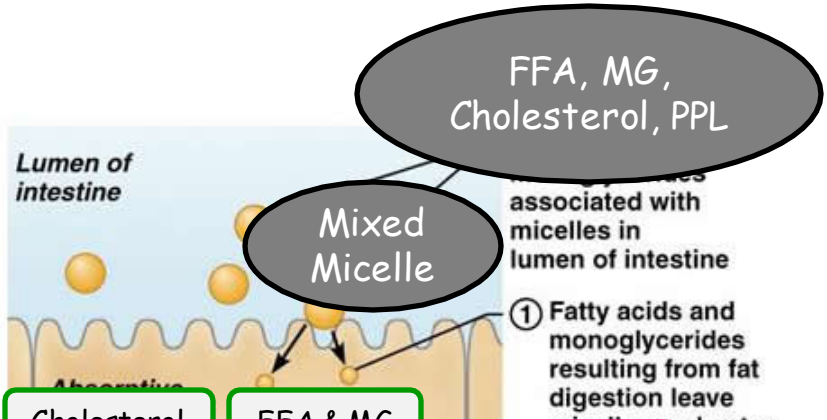


Passes through the circulation
before heading to liver



LPL

Reconstituted in ER (Trig)
Golgi:



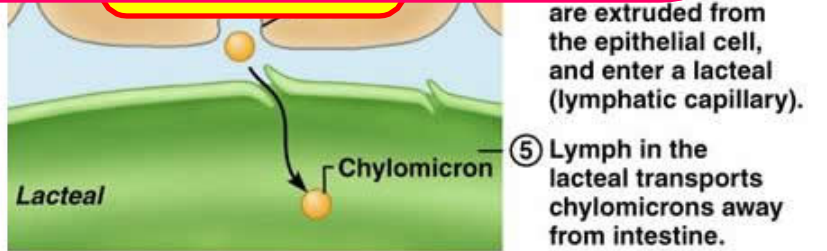
This is our first pass on fat absorption.

Note the requirements:

1. Bile Salts (production, enterohepatic circulation)
2. Pancreatic enzymes (& HCO_3^-)
3. Enterocytes, healthy



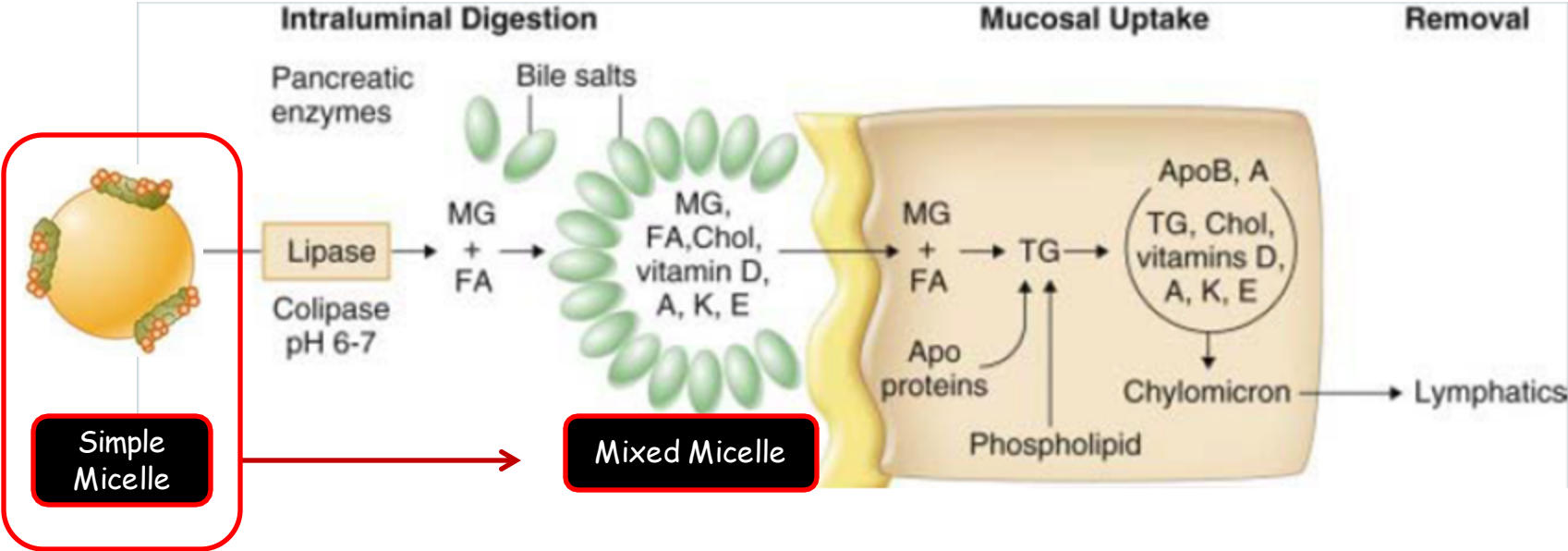
Chylomicrons



Bile

Lipase

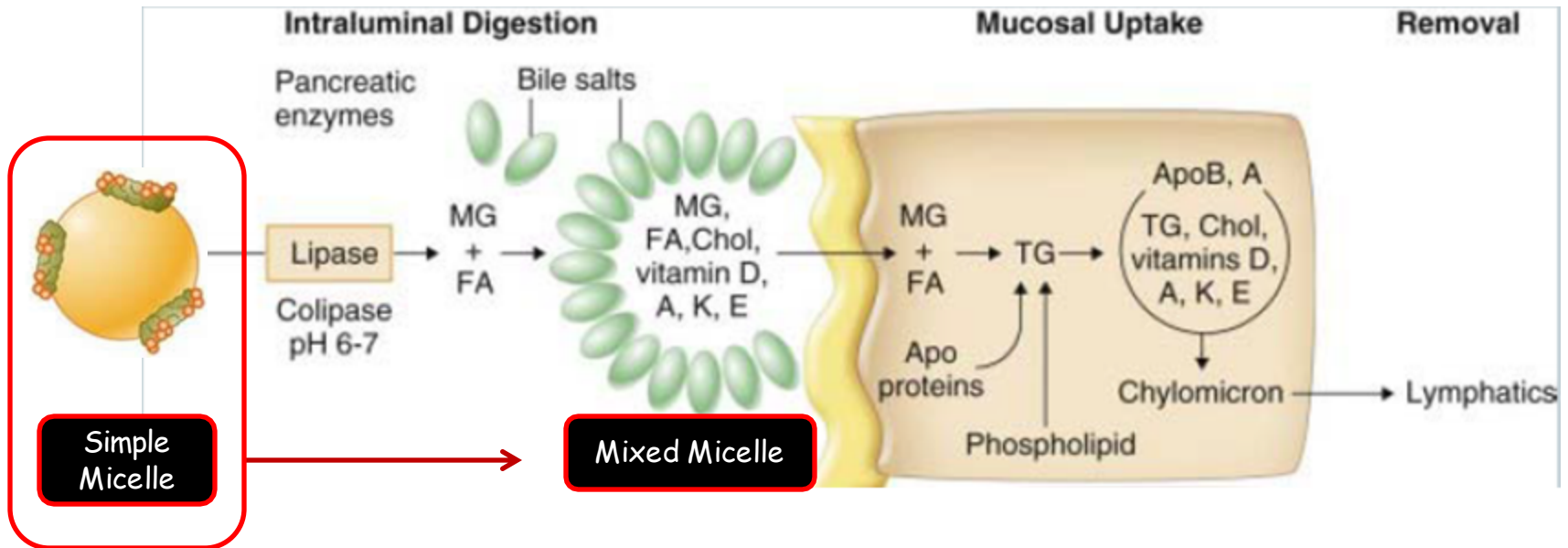
Enterocyte



Bile

Lipase

Enterocyte



Bile Salt Deficiency

Liver Disease (cirrhosis)

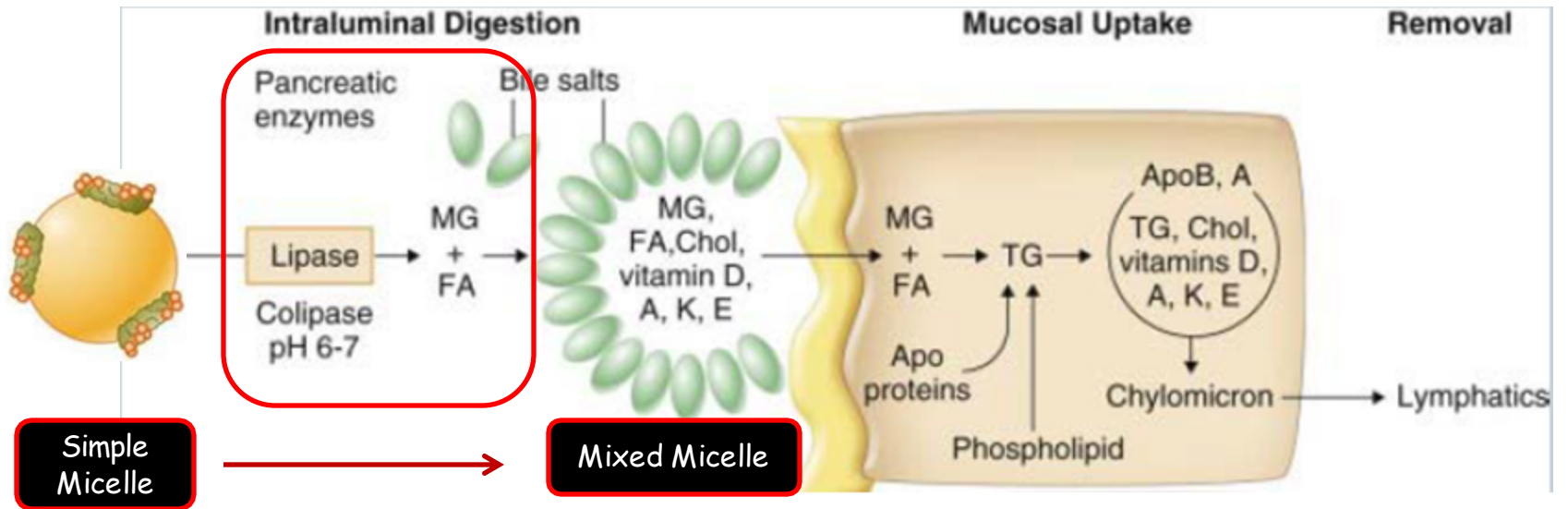
Obstruction

Failure of Enterohepatic Circ (Crohn's disease → terminal ileitis)

Bile

Lipase

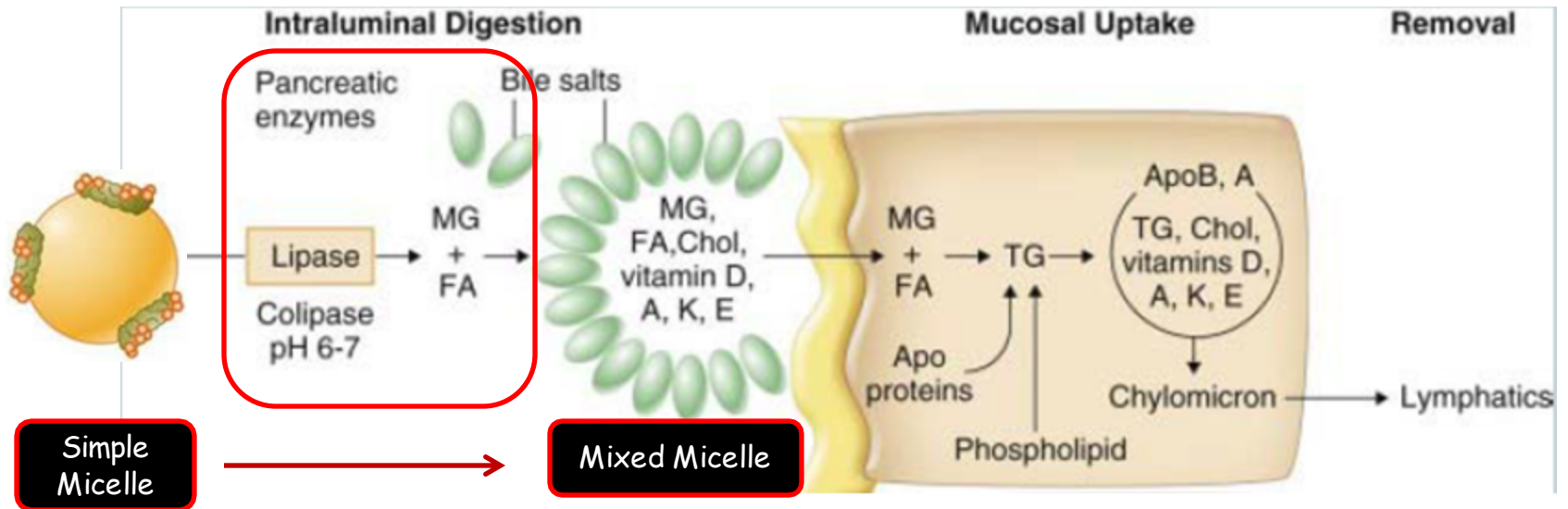
Enterocyte



Bile

Lipase

Enterocyte

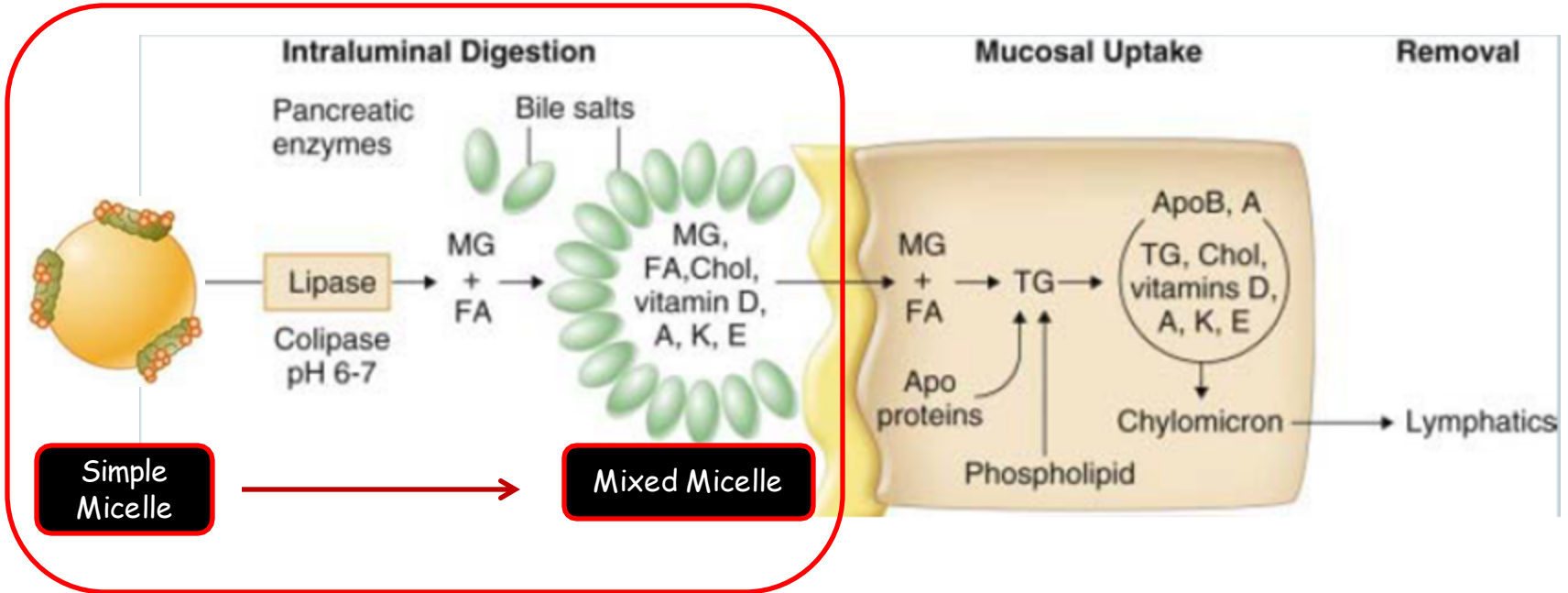


Pancreas Enzyme Deficiency
Chronic Pancreatitis (CF, Etoh)

Bile

Lipase

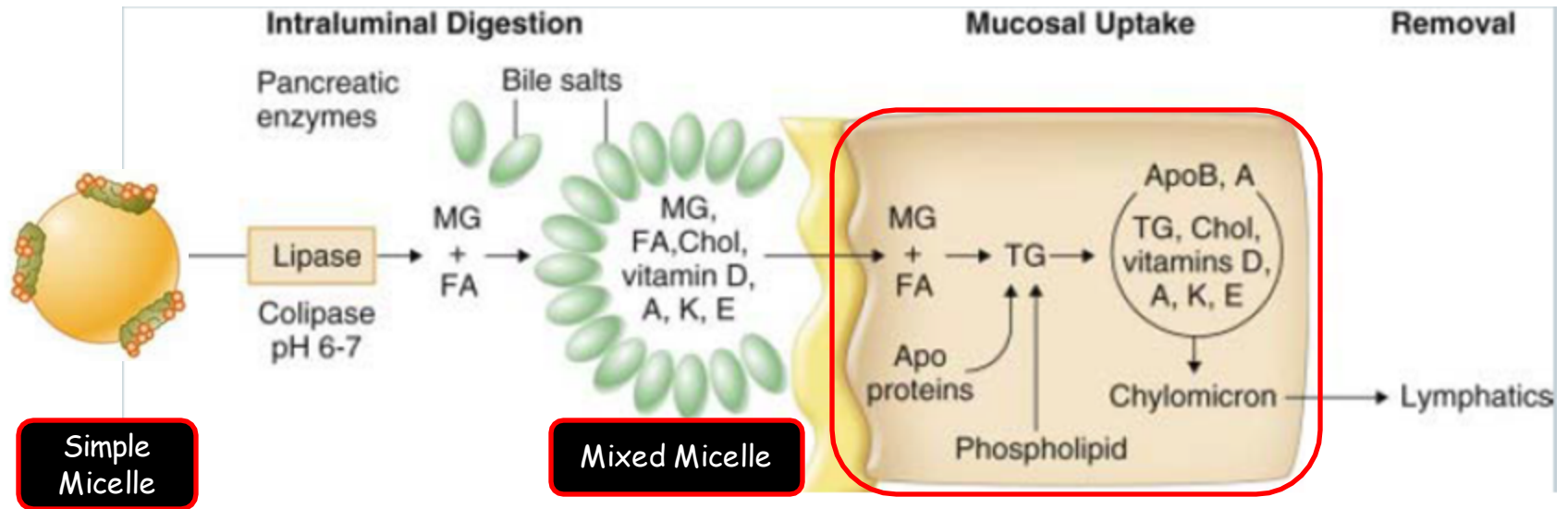
Enterocyte



Bile

Lipase

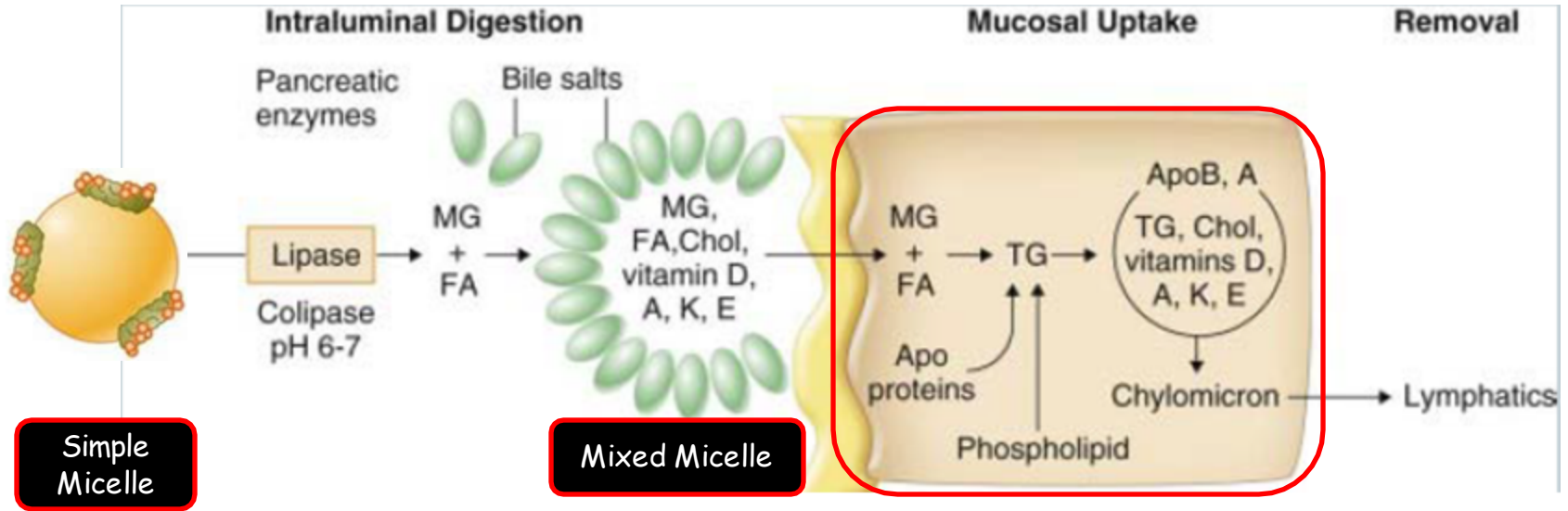
Enterocyte



Bile

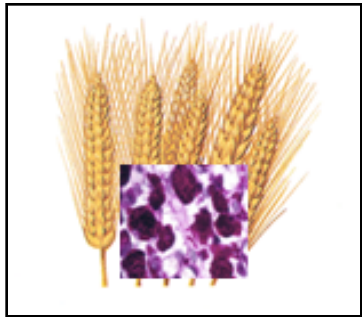
Lipase

Enterocyte



Enterocyte Deficiency

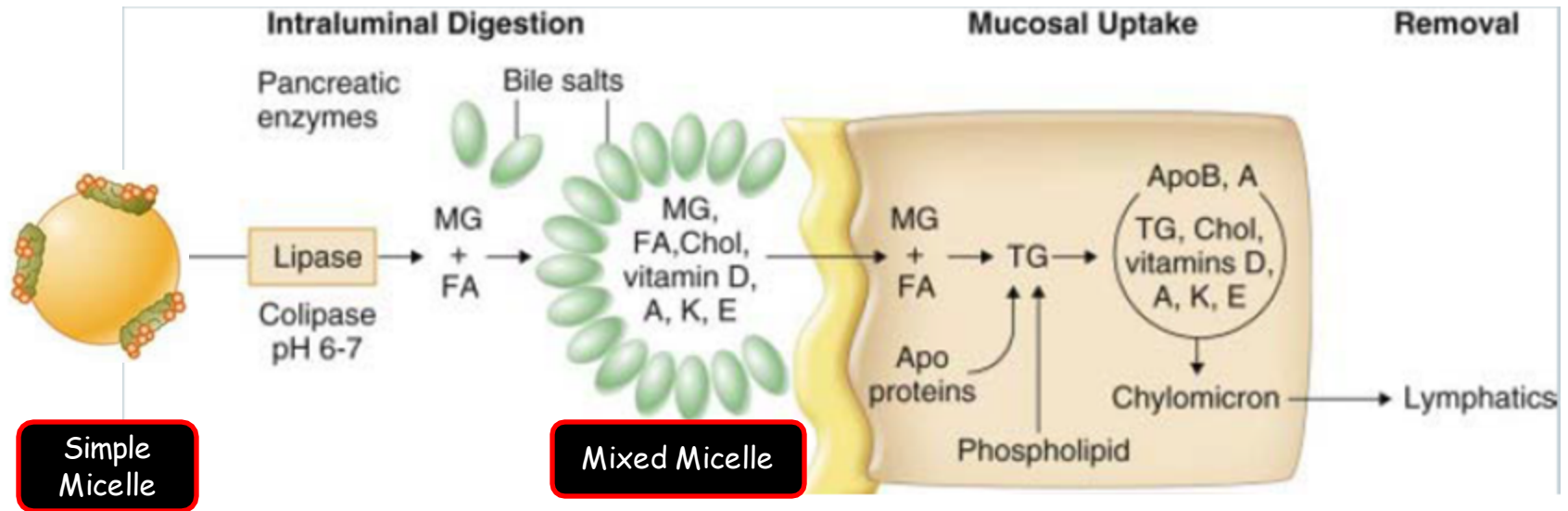
Loss of Villi
Loss of Function
Loss of Number



Bile

Lipase

Enterocyte



Bile Salt Deficiency

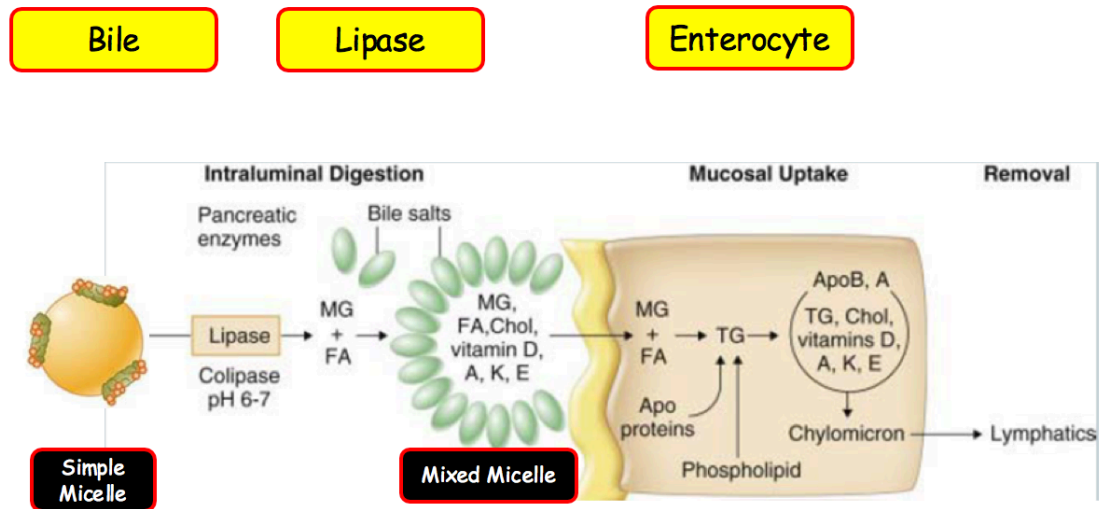
Liver Disease (cirrhosis; CF/PBC)
Obstruction
Failure of Enterohepatic Circ (TI)

Pancreas Enzyme Deficiency
Chronic Pancreatitis (CF, Etoh)

Enterocyte Deficiency

Loss of Villi
Loss of Function
Loss of Number

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