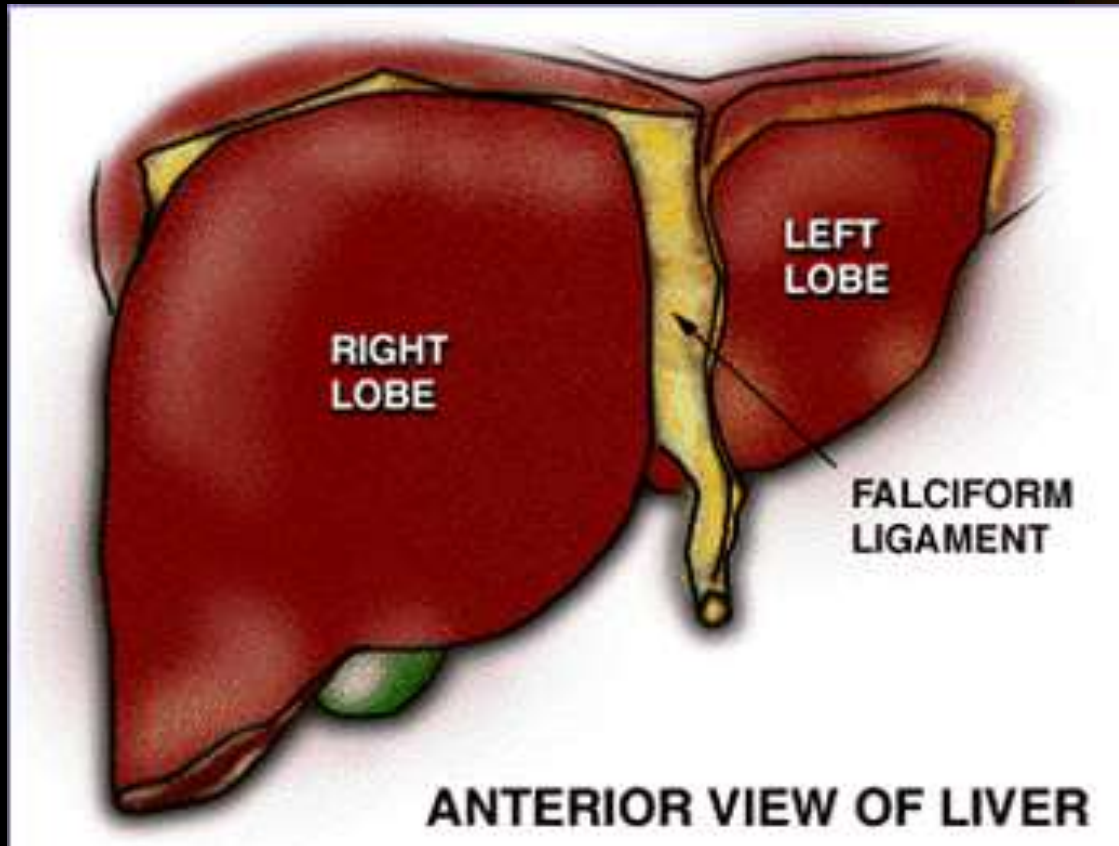


**Liver**

# *Evaluation of Liver Function*



# Liver Functions

- Metabolic: carbohydrate, lipids, protein, vitamins, and hormones
- Storage: glucose, fat, vitamins, and minerals
- Hematologic: Fe metabolism, coagulation, recycle RBC products, and albumin production
- Digestive: bile acids
- Detoxification and excretion:  $\text{NH}_3$ , bilirubin,

# Reasons for Laboratory Testing



- Assist in the differential diagnosis of icterus.
- Detect primary liver diseases either with or without icterus .
- Diagnosis of secondary liver disorders
- Offer a clinical prognosis of hepatic diseases

# *Limitation of liver function tests*



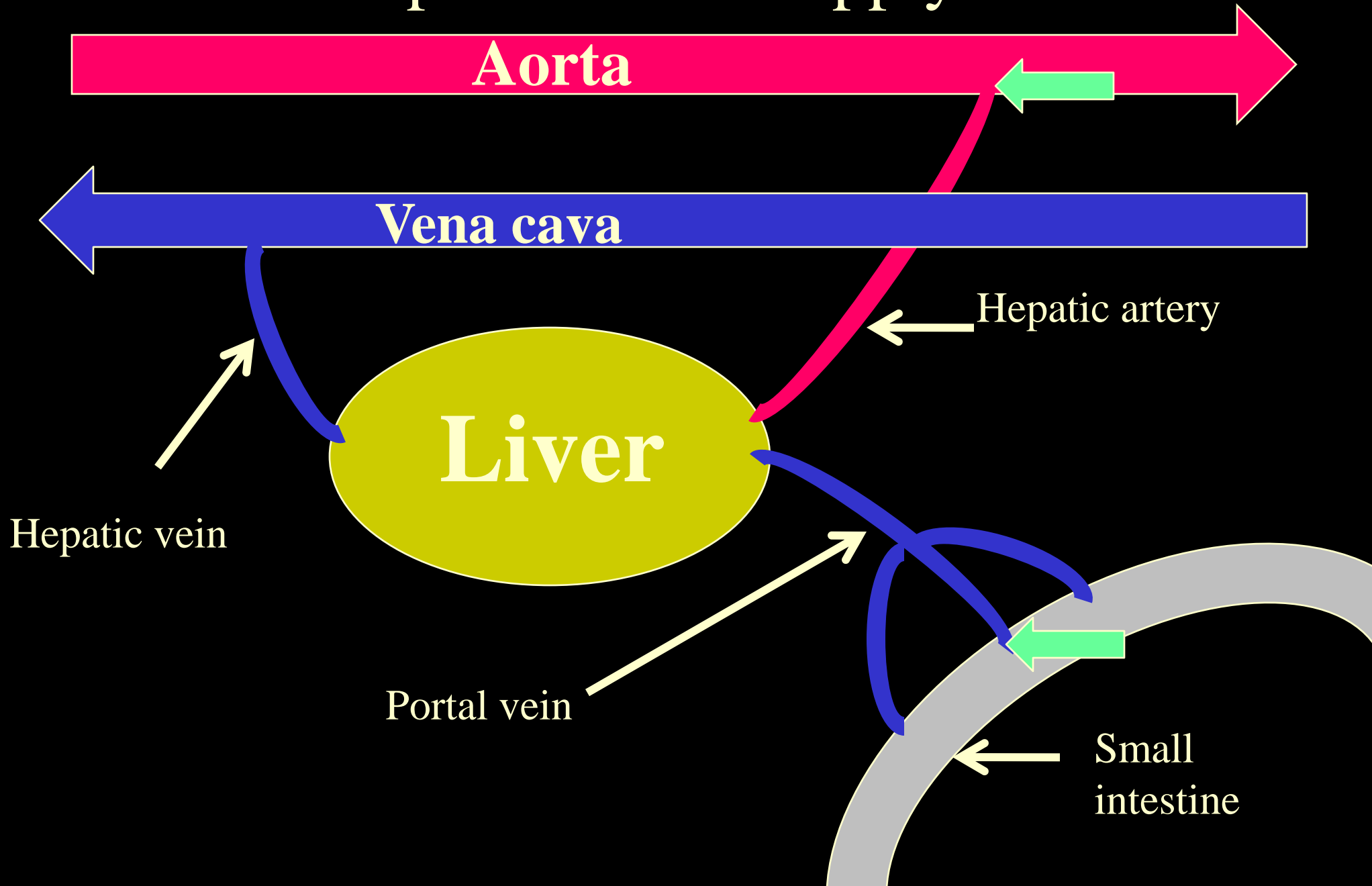
- Extensive damage is required
- The test are lacking sensitivity or so sensitive.
- There are so many functions
- Pathologic conditions of extra- hepatic origin

# *Signs of liver diseases*

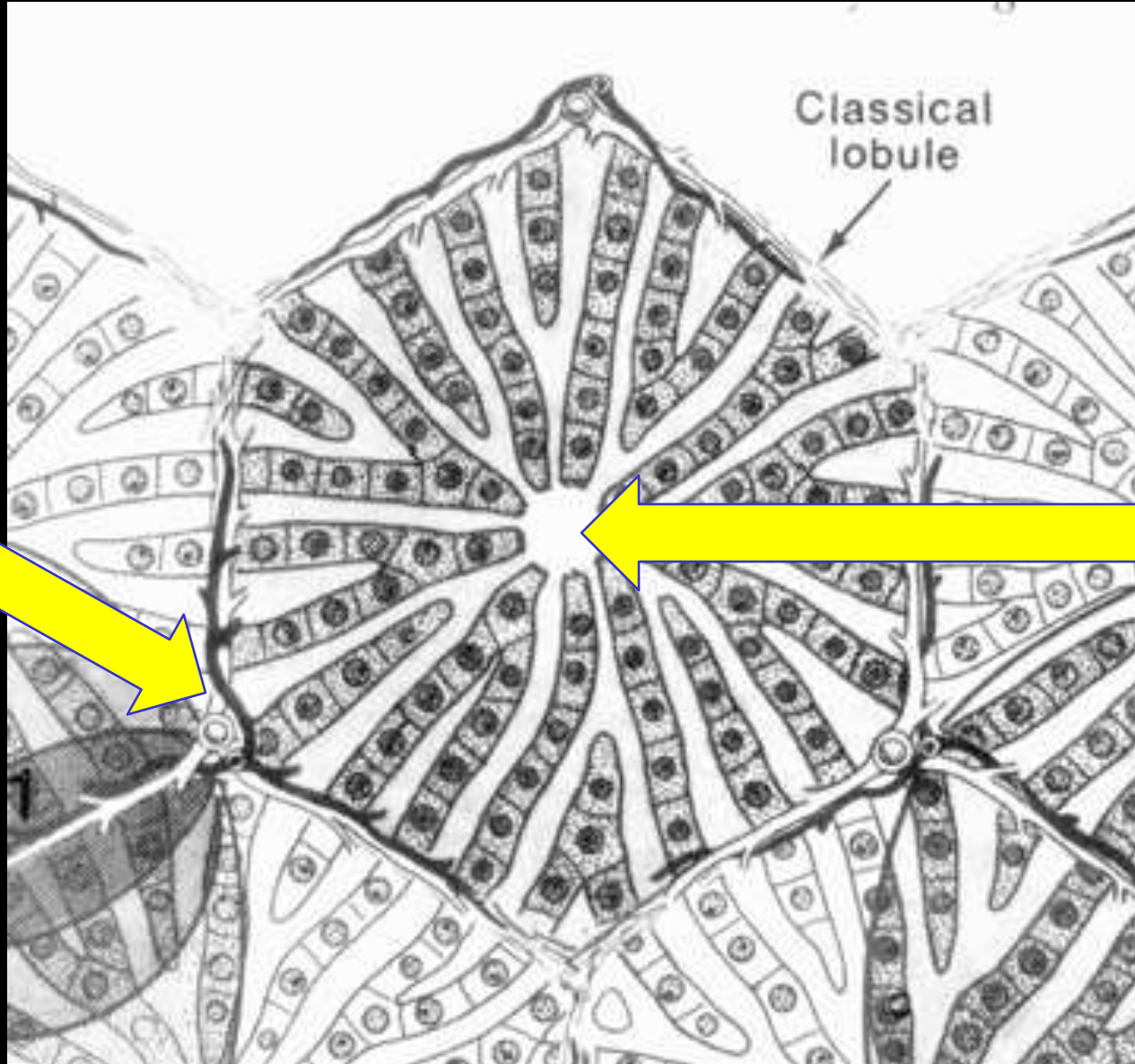
- No pathognomonic signs of liver disease
- Lethargy
- Anorexia
- Weight loss
- Vomiting
- Jaundice
- Altered mental state (depression to seizures)



# Hepatic Blood Supply



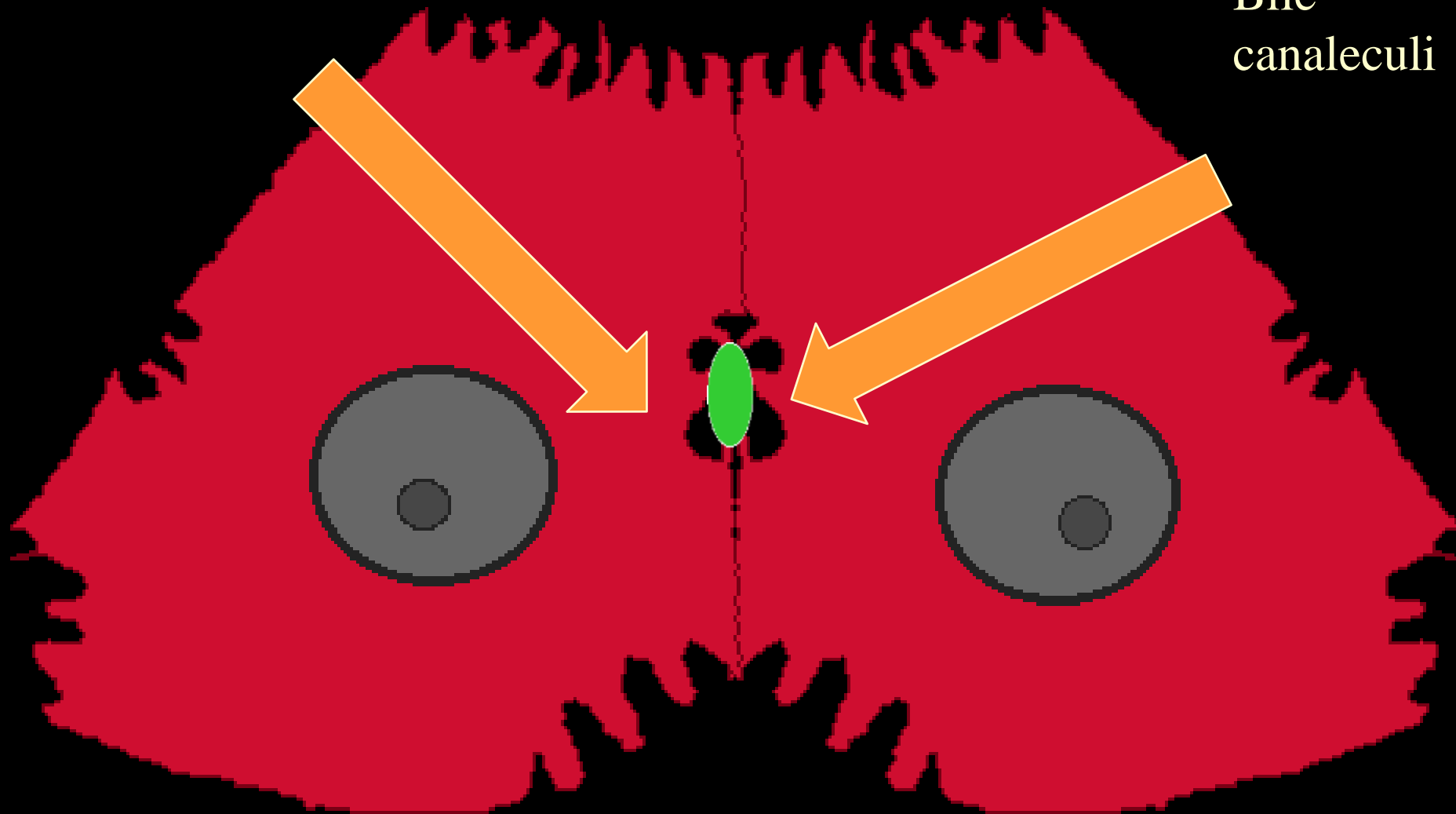
**Portal area**



**Central  
vein**



Bile  
canaleculi



Collect bile from liver cells

# liver function test



1. Albumin

2. AST

3. ALT

4. AP

5. GGT

6. Ammonia

7. Bilirubin

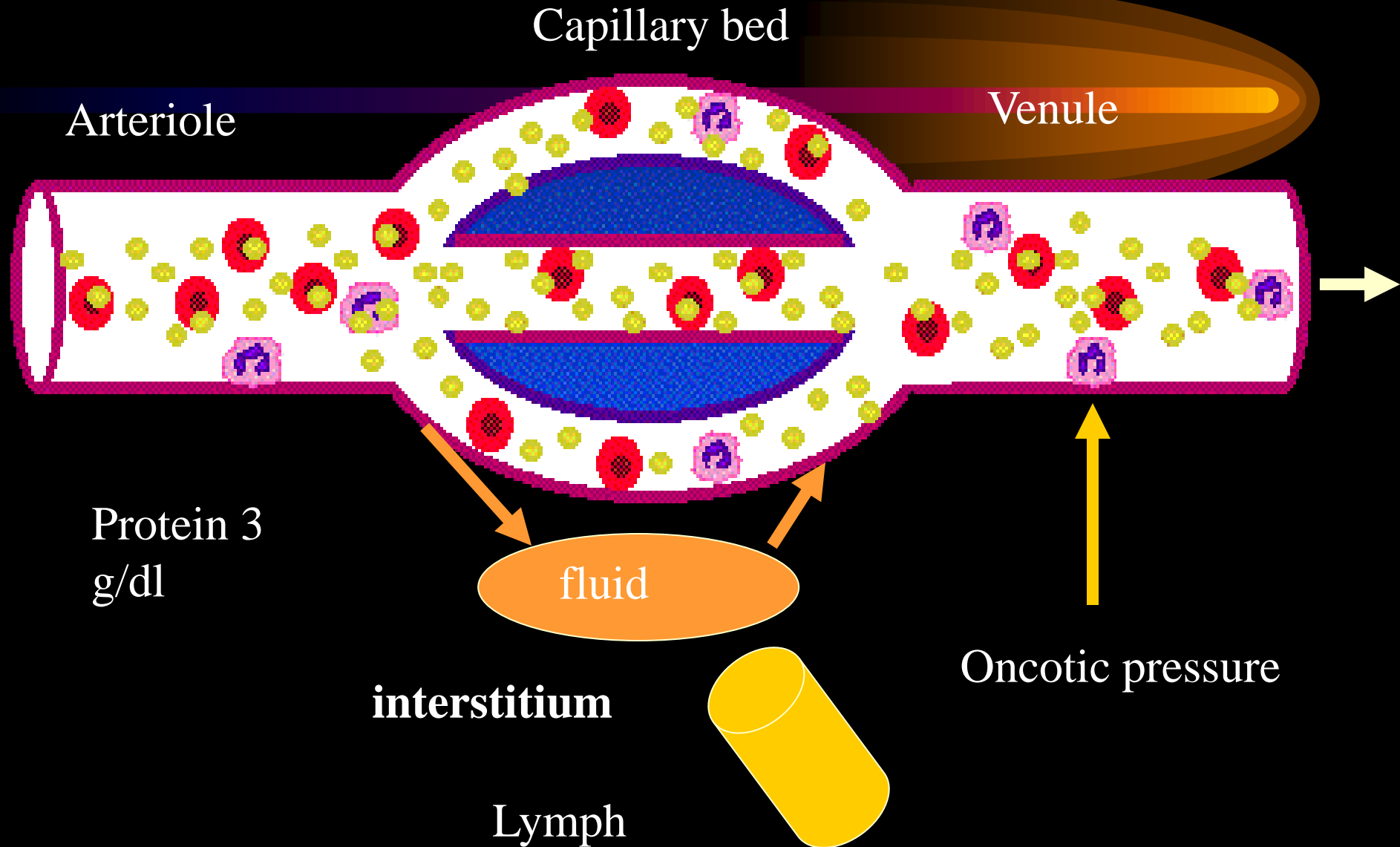
8. Bile acid

# *Albumin*

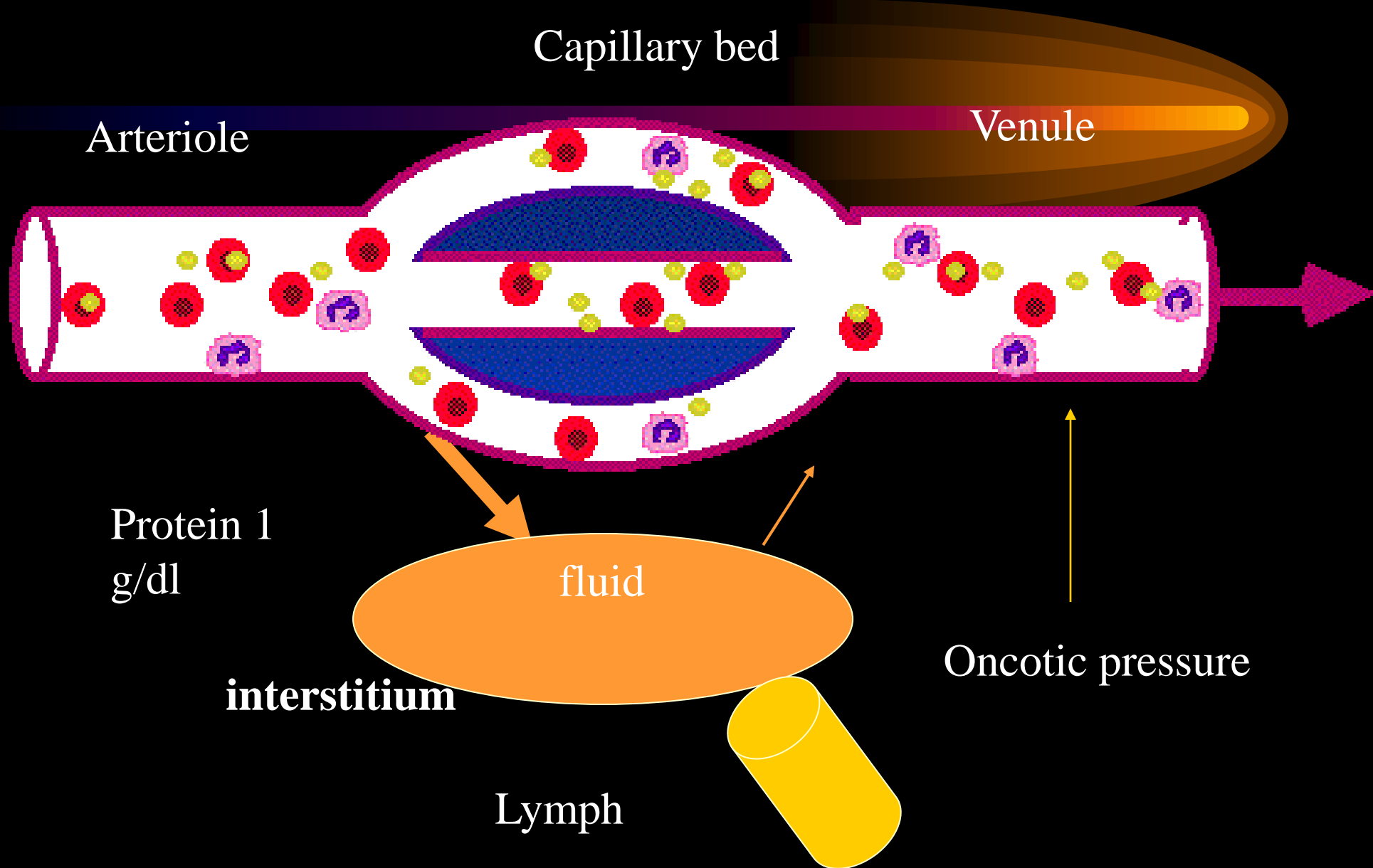
- Produced by hepatocytes
- Carrier protein for bilirubin, bile acids, ffa, drugs etc.
- Accounts for 75% of the colloidal osmotic pressure.



# *Albumin & Oncotic pressure*



# *Decreased albumin*



# *Measurement of Plasma Proteins*

- **Total protein:** spectrophotometer
- **Albumin:** spectrophotometer
- **Globulin** is derived mathematically

Total protein - albumin = globulin

This globulin is sum of all alpha + beta + gamma

- **Serum protein electrophoresis** is used for separation



# *ALBUMIN*



- **Hyperalbuminemia:**
  - **Dehydration (but other serum proteins would also be increased).**



# *Hypoalbuminemia*

## 1. Decreased synthesis:

- a. Intestinal malabsorption or malnutrition
- b. Exocrine pancreatic insufficiency
- c. Liver disease
- d. Acute or chronic inflammatory disease

## 2. Increased loss:

- a. Glomerulonephritis, Hemorrhage
- b. Protein-losing enteropathy or intestinal parasites
- c. Exudative skin disease (burns or pyoderma)

## 3. Excessive breakdown

- a. Prolonged fever
- b. Uncontrolled diabetes mellitus
- c. Thyrotoxicosis

# *Normal serum electrophoresis*

