- Distribution of PGlucose:

free glucose in E.C.F. = 20gr ≡ 80 Cal

= glycogen in liver = ~ 75 gr ± 100g

" " " : muscle = ~ 400 gr

- Liver glycogen maintain blood glucose ⟶ 16 hr
- Brain use ~ 120 gr of glucose / day
- 70 kg man has ~ 15 Kg fat ≡ 130,000 Kcal

" supply energy ⟶ 60 - 90 days

- Conc of ATP in muscel ~ 5 mM

" " Creatine phosphate (CP) : ~ 20 mM

Upon vigorous excercise

ATP ⟶ 2 to 4 sec

CP ⟶ 20 sec

- Post absorptive resting muscle or with moderate excercise ⟶ F.A. main source

80% of glucose is utilized by brain & rbc

- During prolonged fasting, utilization of F.A. by all tissues (except brain & rbc) is increased 4 to 5 times & ketone bodies by more than 100-times

GLUCONEOGENESIS

- **Glucose Synthesis Is Required for Survival**

- Pathways of Gluconeogenesis

(2) Lactate → (2) Pyruvate ← Amino acids

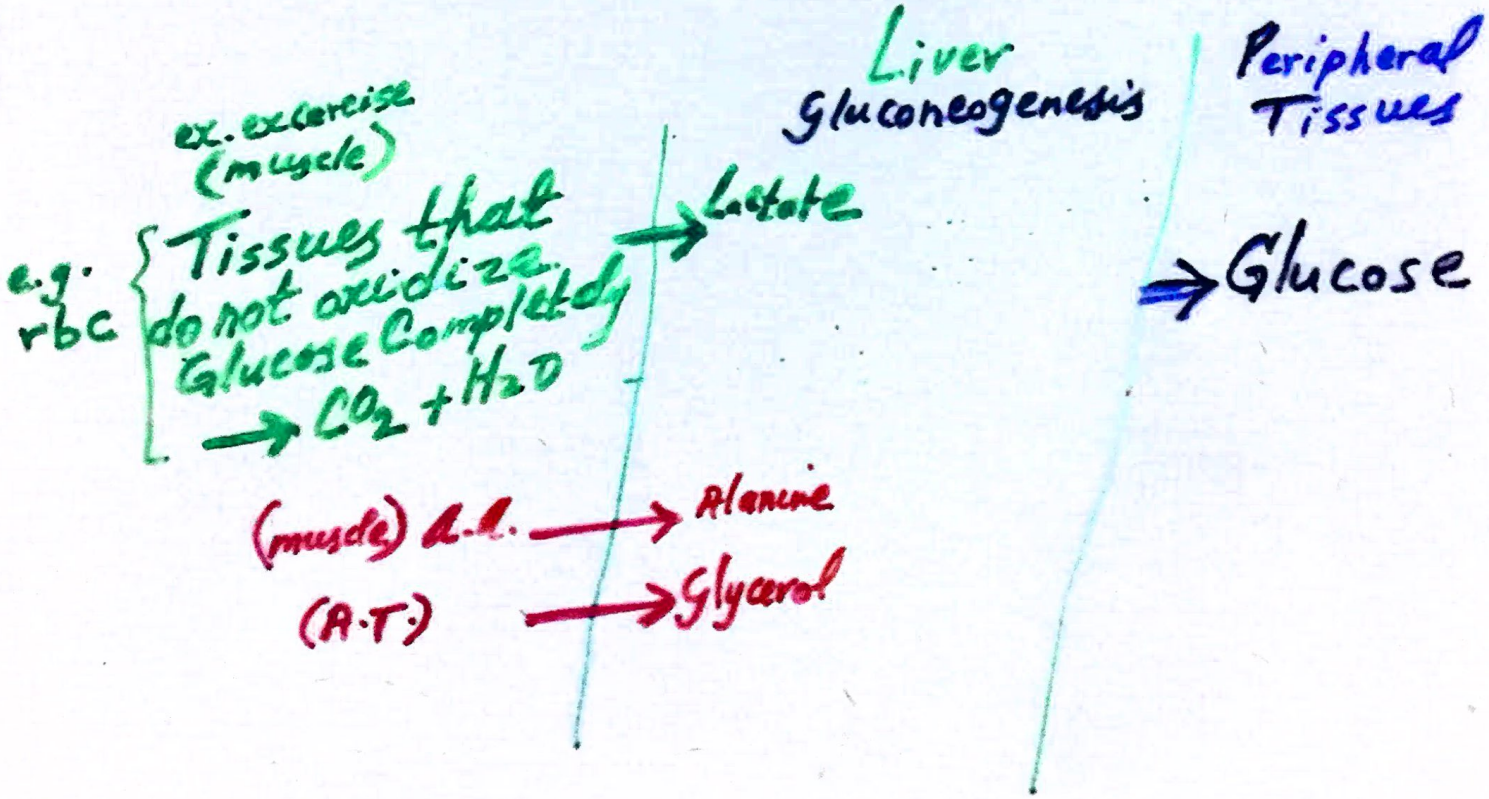
(2) Propionate → (2) Oxaloacetate

Amino acids →

Fructose → (2) Triosephosphates

(2) Glycerol →

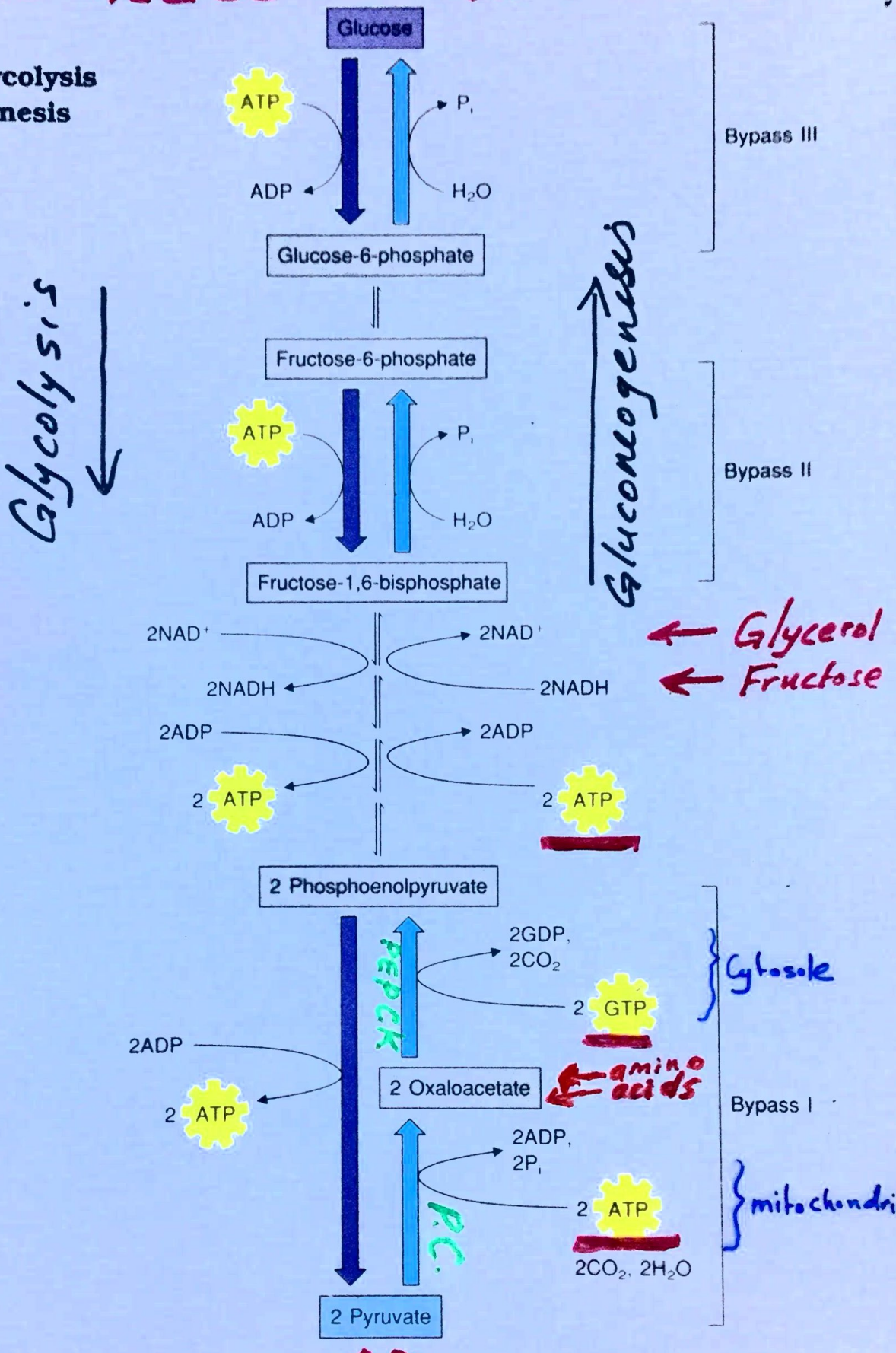
Galactose → Glucose



ENERGY For GLUCONEOGENESIS 2

Reactions of glycolysis and gluconeogenesis

Figure 16.3



Key Reactions of Gluconeogenesis

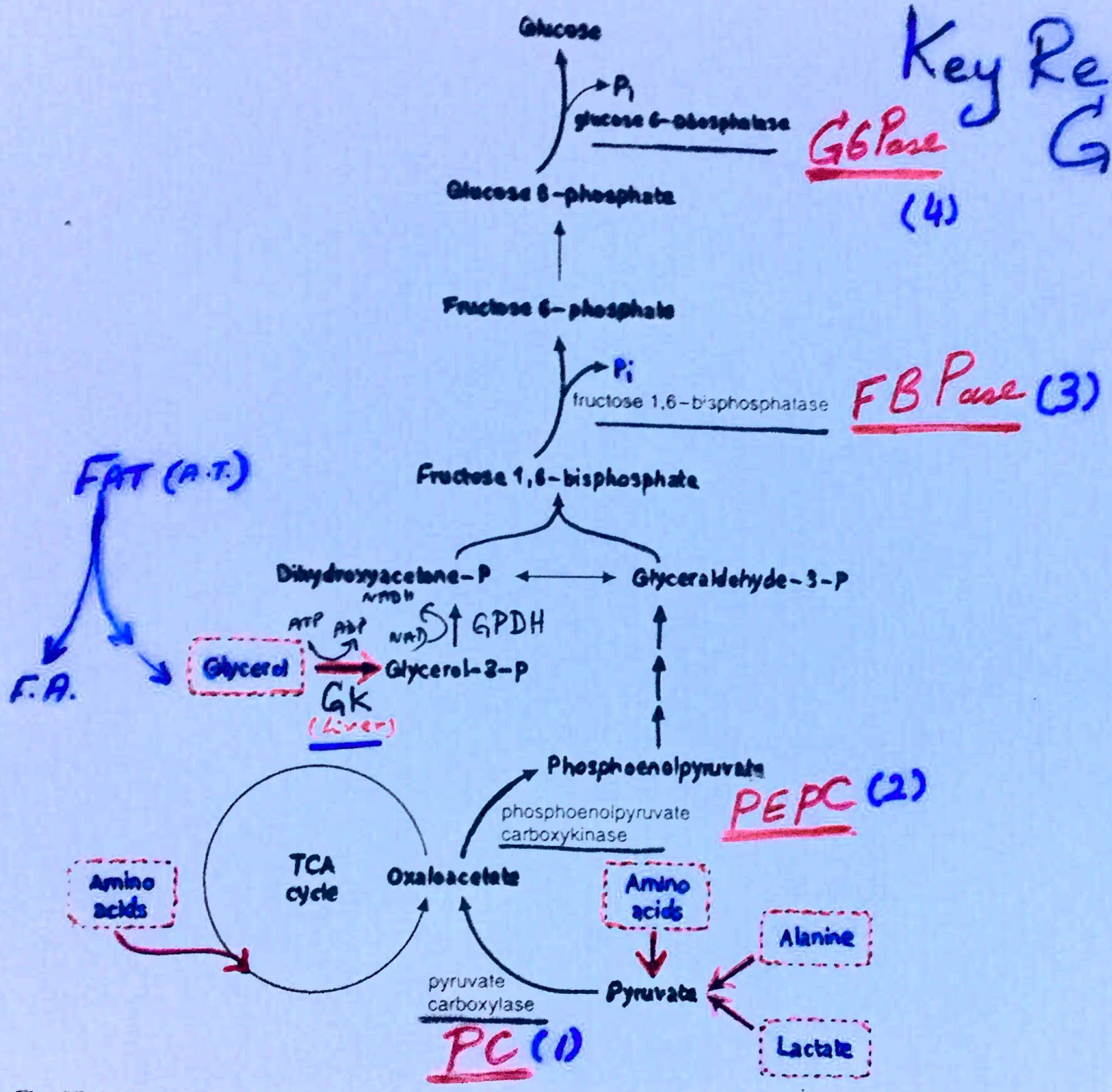
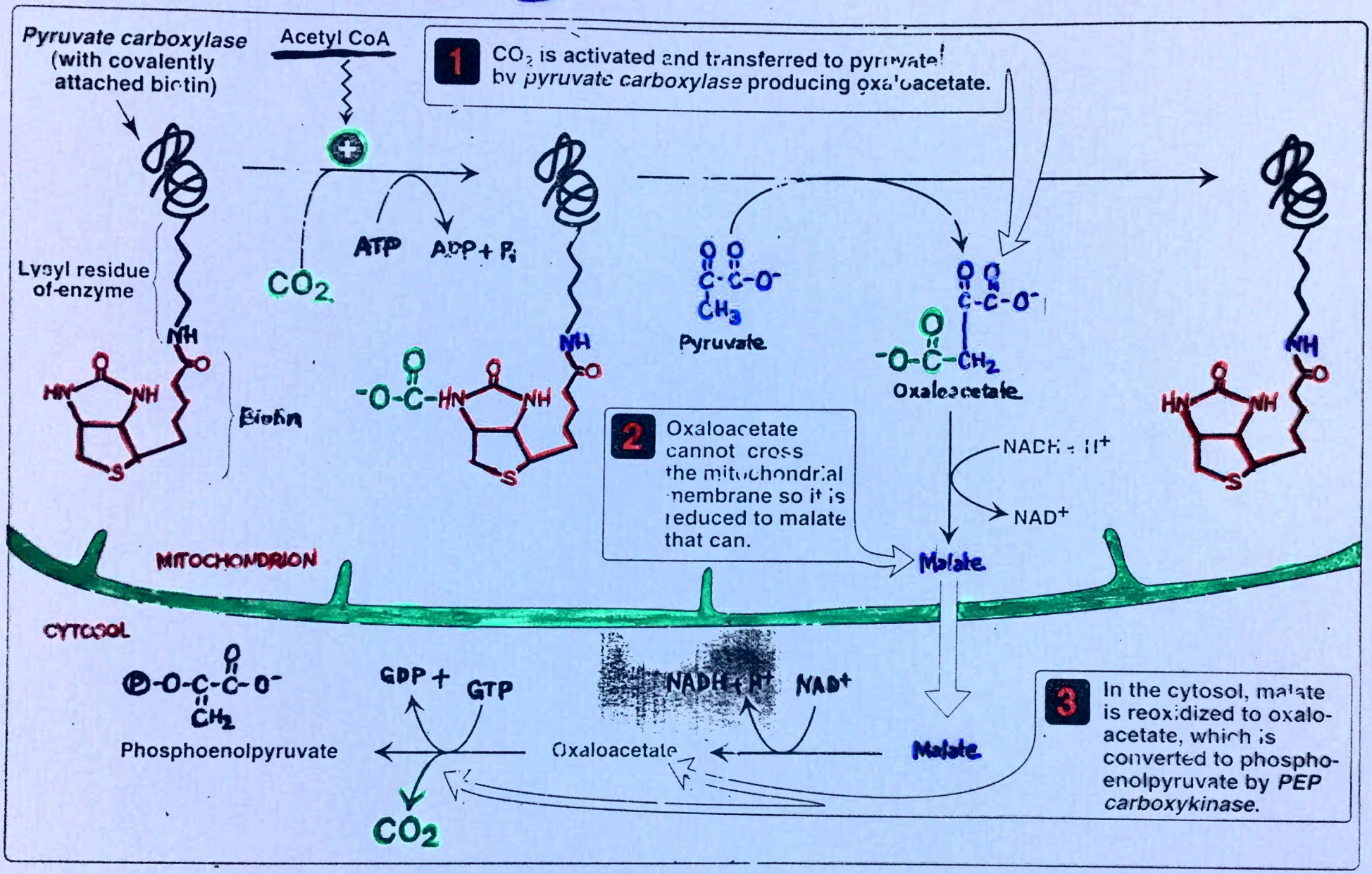


Fig. 27.6. Key reactions of gluconeogenesis. The precursors are amino acids (particularly alanine), lactate, and glycerol. Heavy arrows indicate steps that differ from those of glycolysis.

Pyruvate Carboxylase :-



Regulation of Gluconeogenesis and Glycolysis

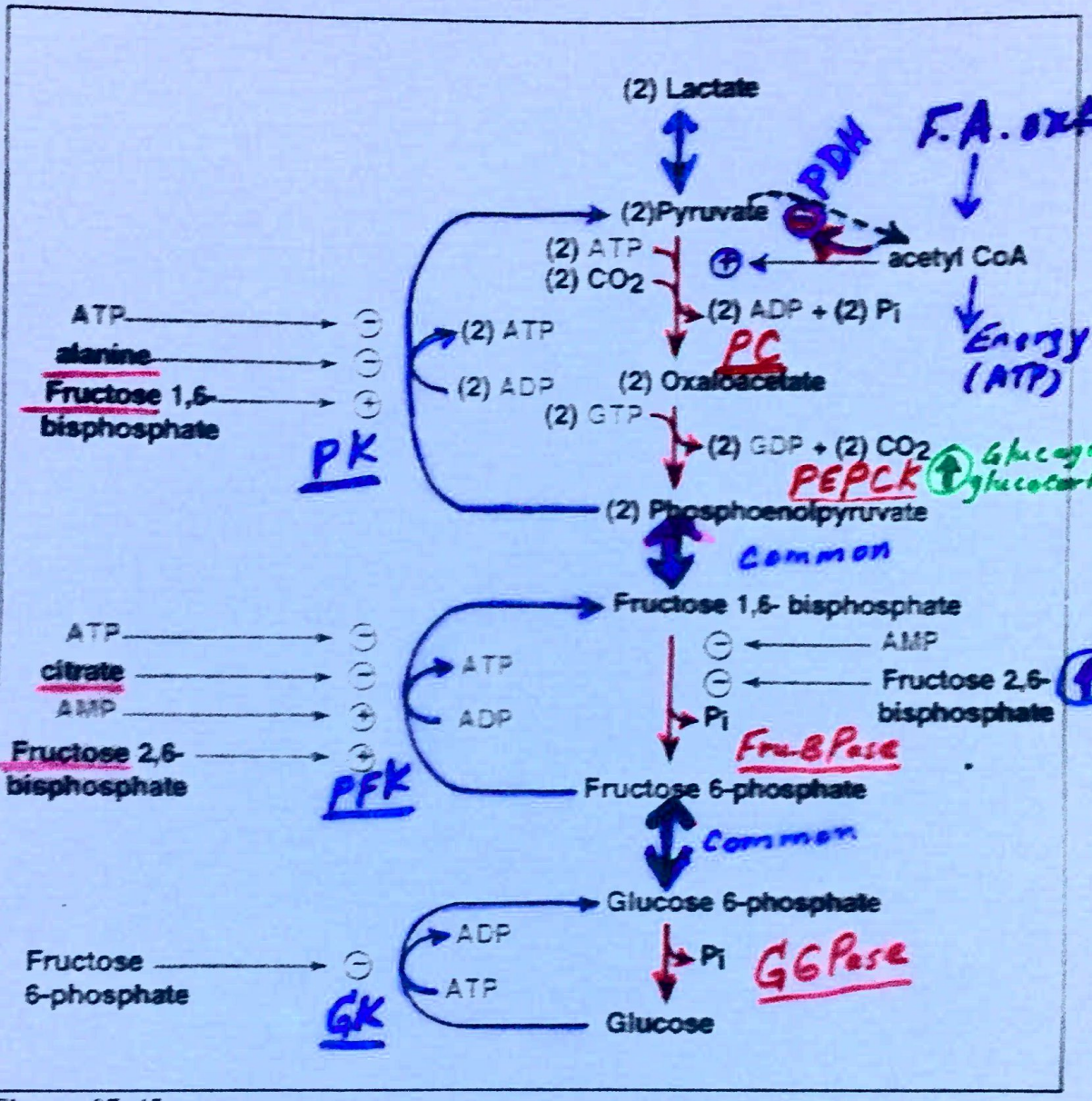
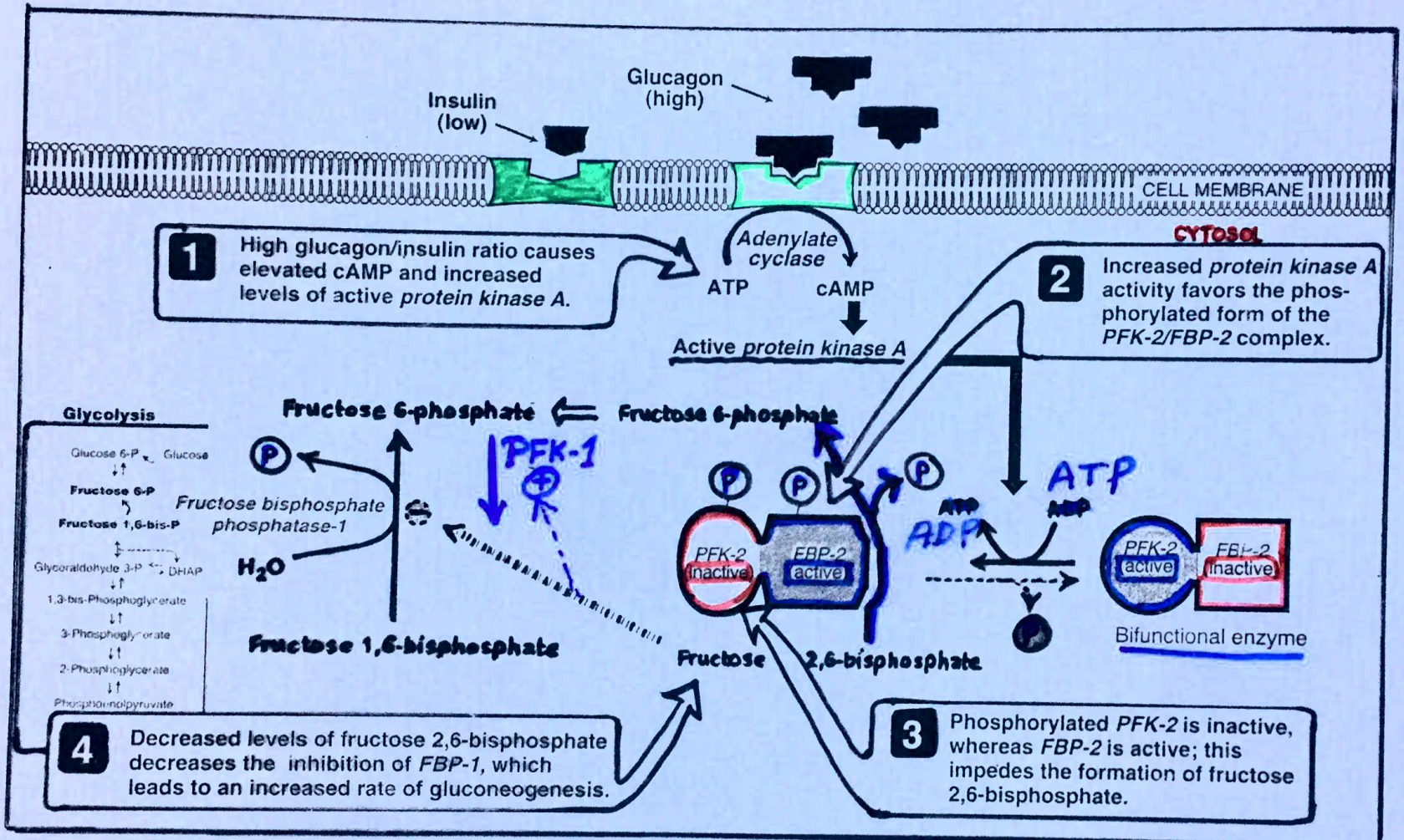
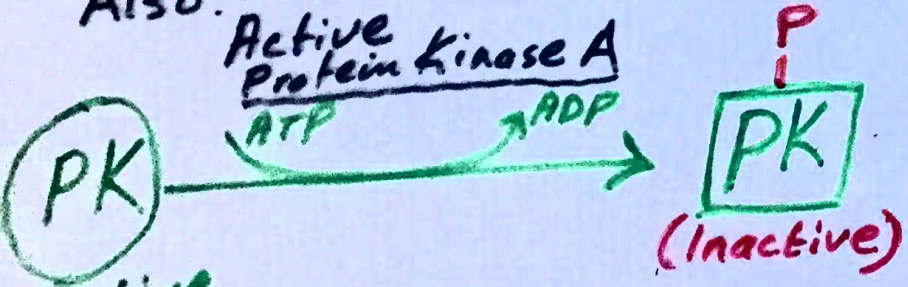


Figure: 07_45
Important allosteric regulatory features of the gluconeogenic pathway.

Deinhibition of fru-1,6-bisphatase



Also:-



Net results:

- Inhibition of glycolysis — PFK ↓, PK ↓
- Removal of inhibition of (Deinhibition) gluconeogenesis

Fru 2,6BP ↓

F-2,6-BPase ↑

Energy Requirements of Gluconeogenesis

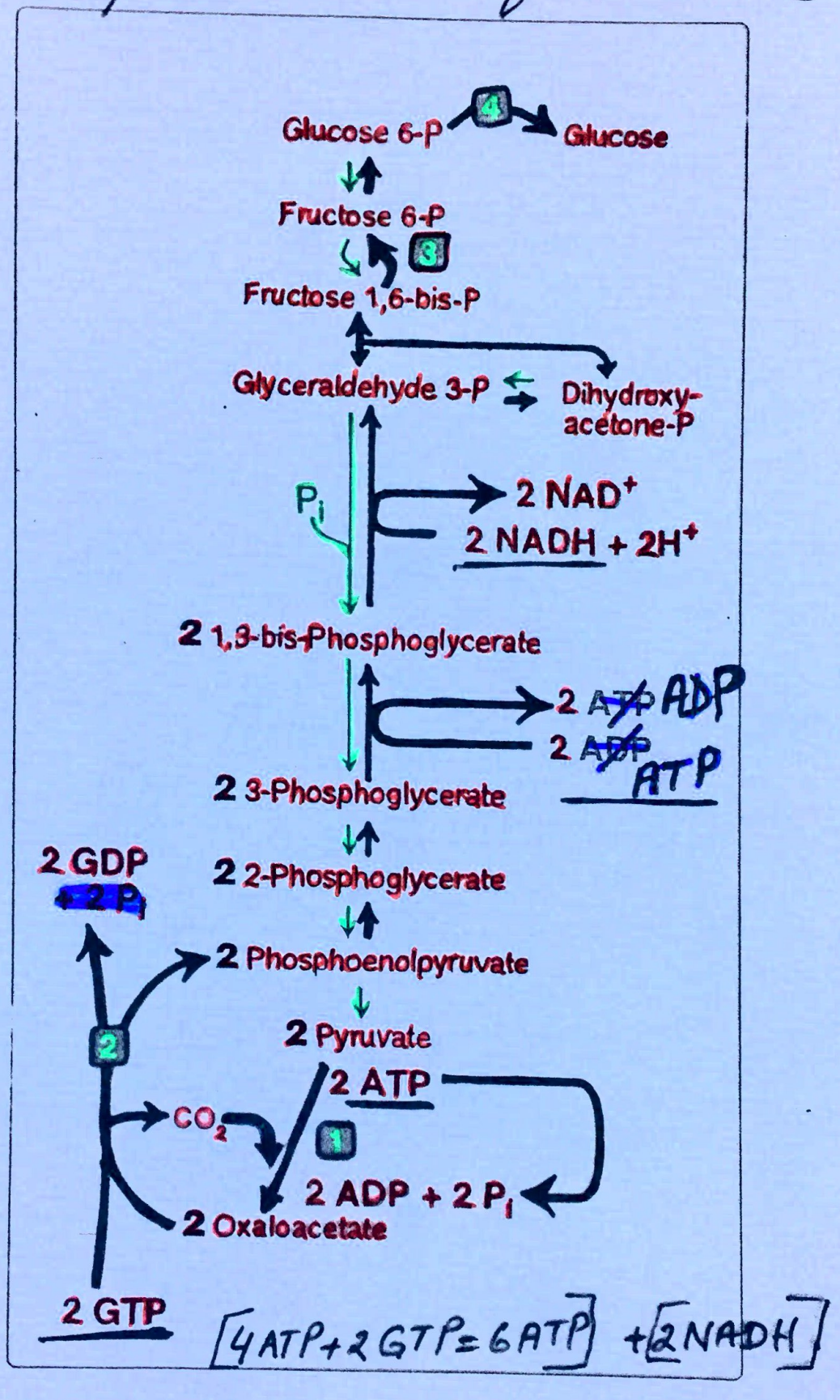


Figure 10.7
Summary of the reactions of glycolysis and gluconeogenesis, showing the energy requirements of gluconeogenesis.

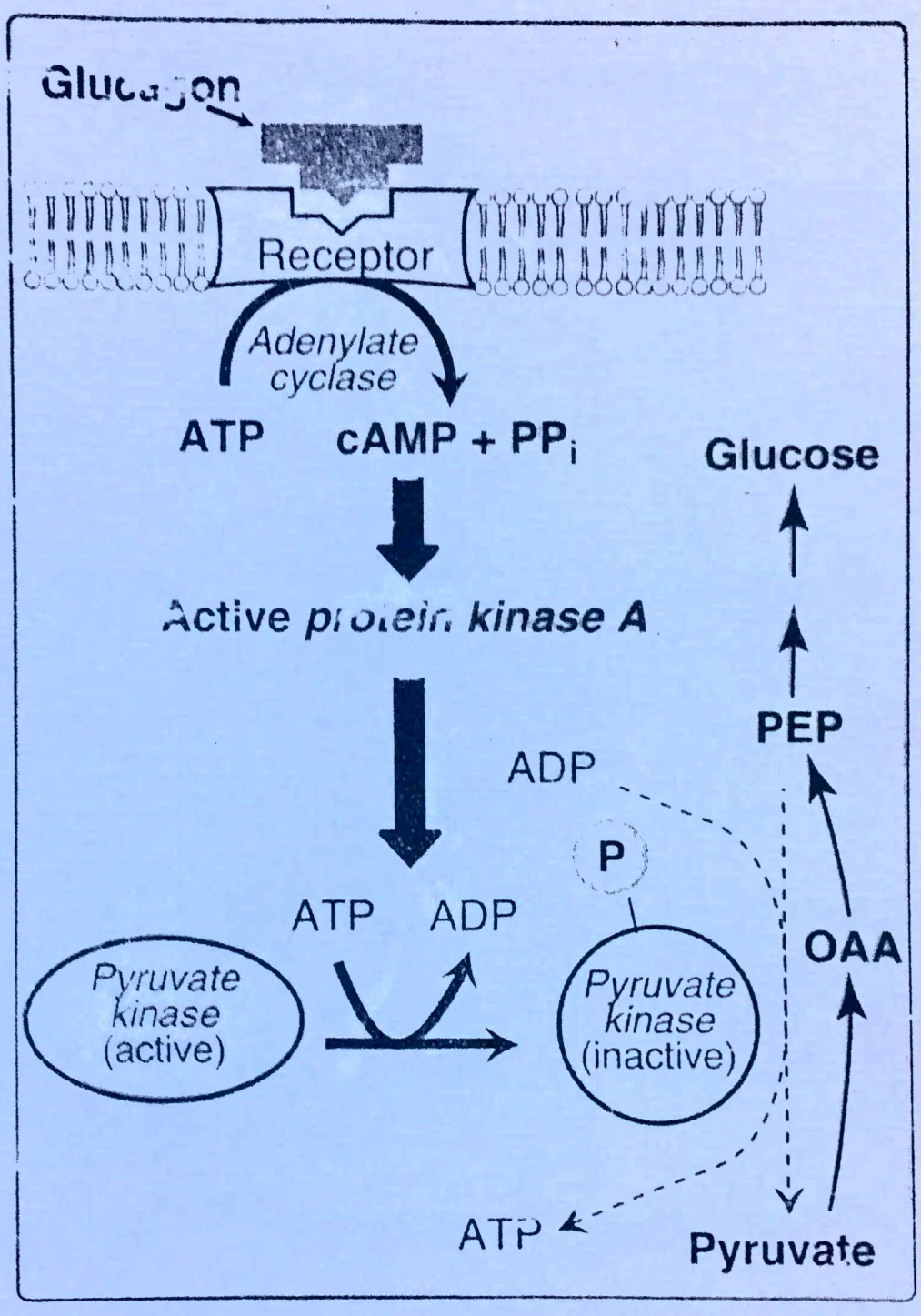


Figure 10.8
Covalent modification of *pyruvate kinase* results in inactivation of the enzyme. OAA = oxaloacetate.

CORI CYCLE

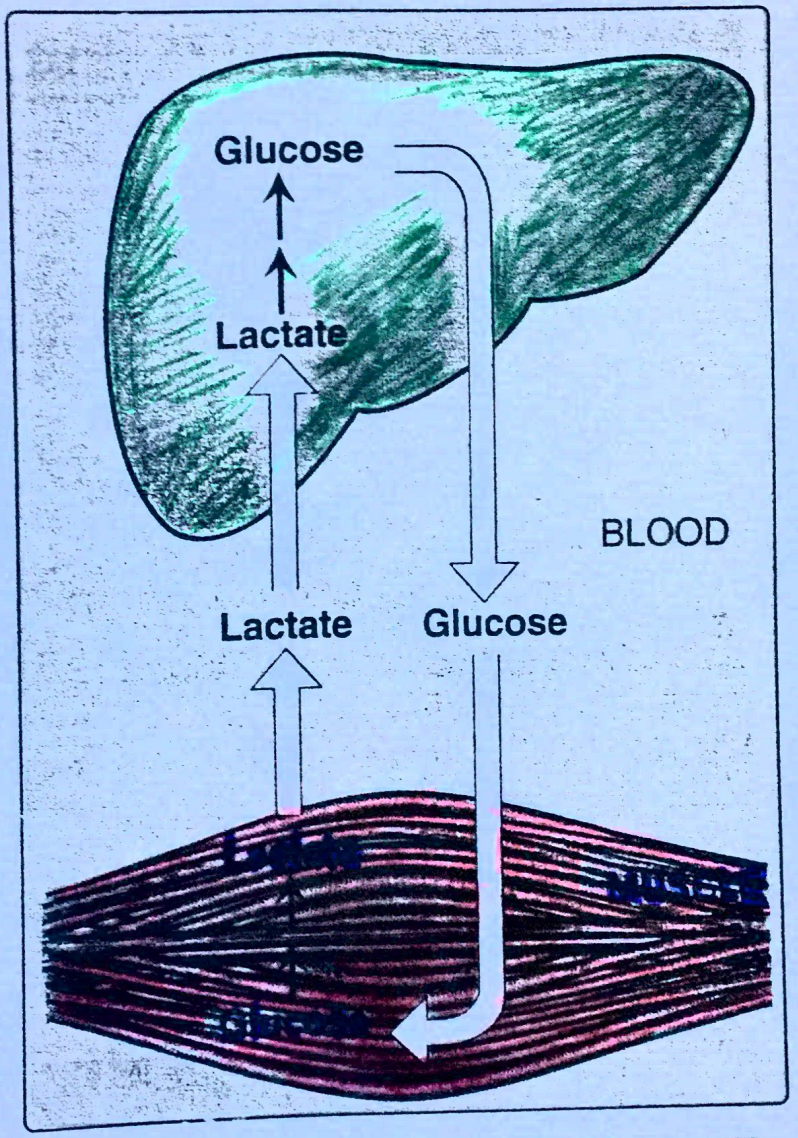
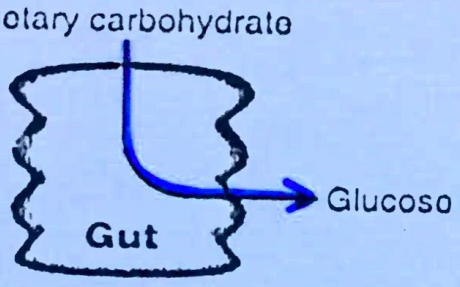


Figure 10.2
The Cori cycle.

Maintenance of Blood Glucose

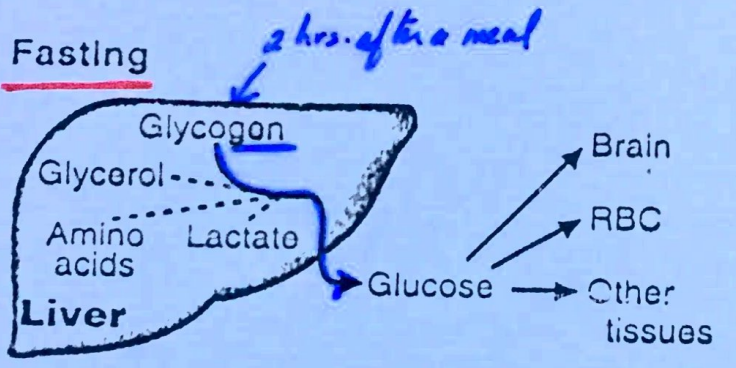
Sources of Blood Glucose:-

Fed



Fasting

Glycogen Breakdown (mainly) + gluconeogenesis



Starved

Gluconeogenesis (mainly)