

Fotossíntese +  
Pentoses

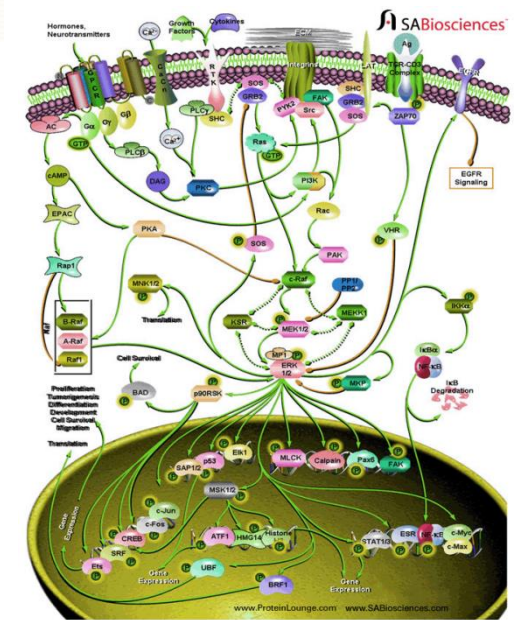
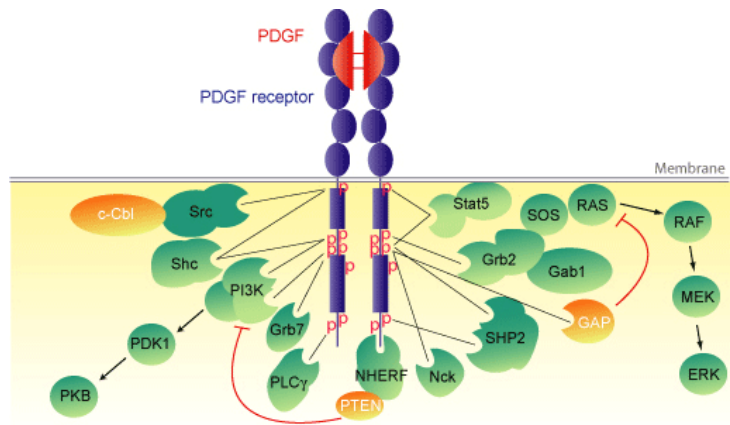
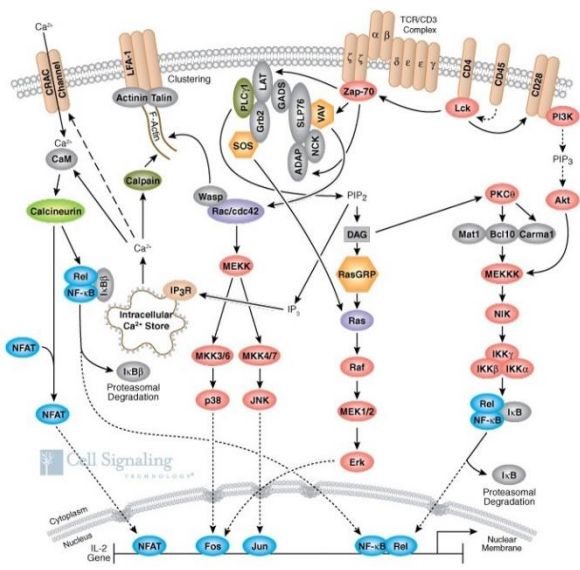
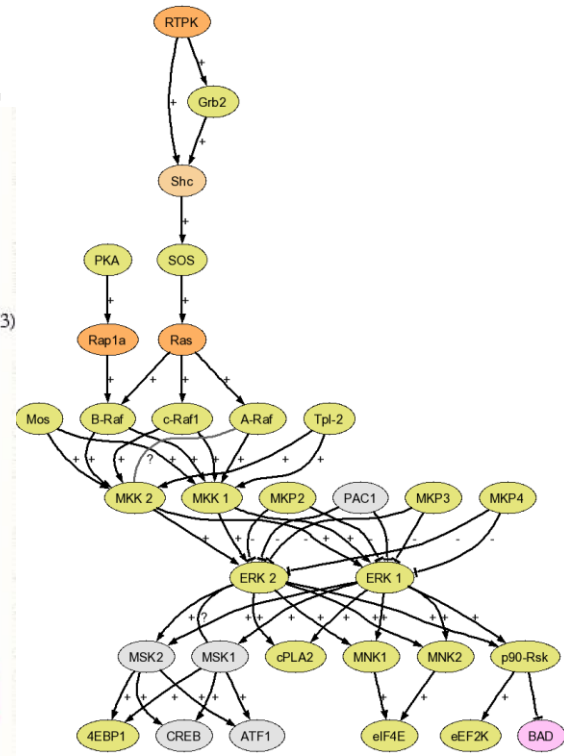
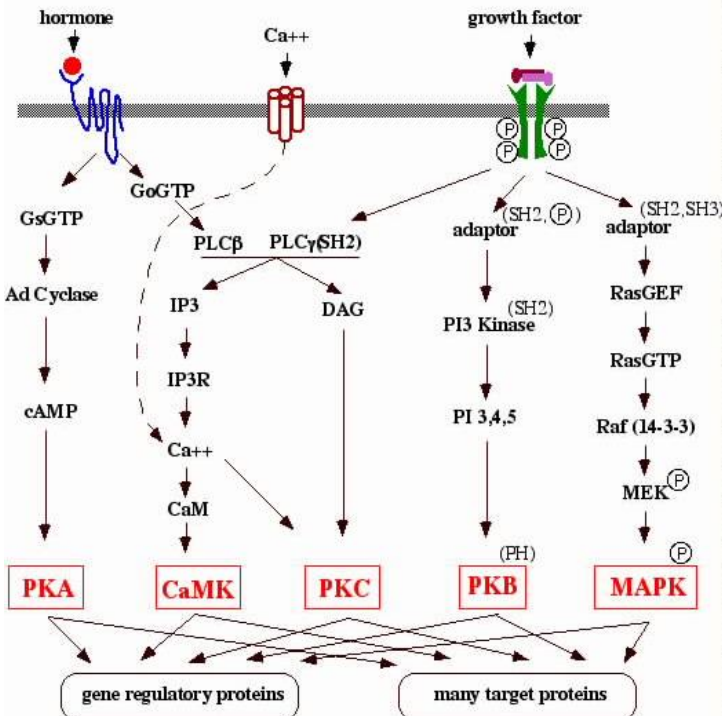
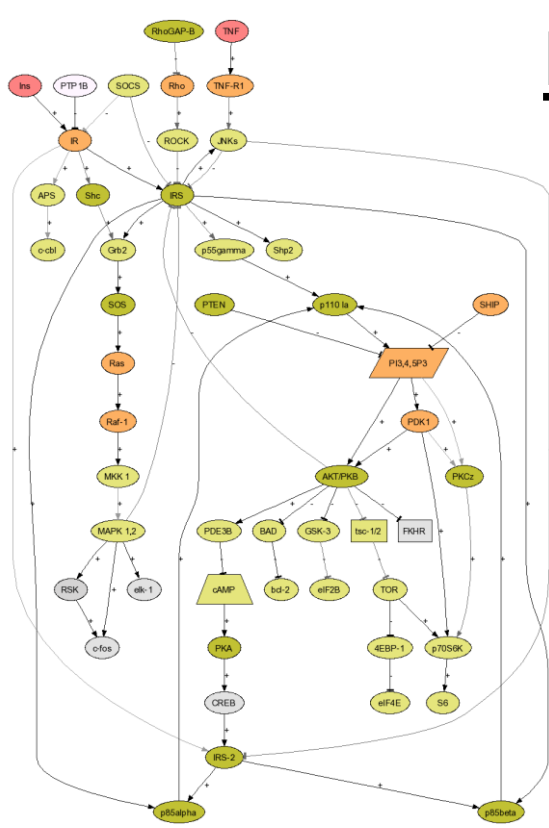
Met.  
carboidratos

Met. ác.  
nucleicos

Met. lipídeos

Met.  
aminoácidos

# Redes de Sinalização



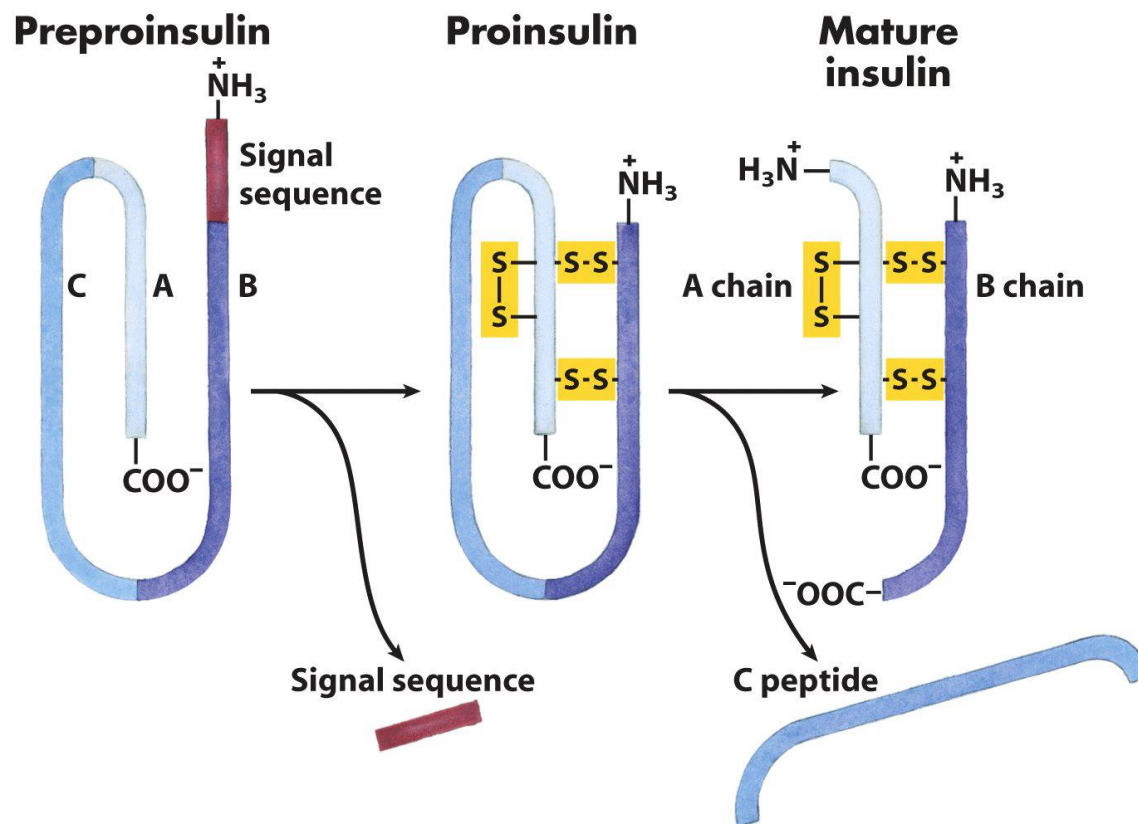
# Hormônios

- Biomolécula produzida em uma parte do corpo que regula funções a distância
- Age em baixas quantidades
- Essencial para organismos multicelulares
- Age por meio de receptores na célula-alvo

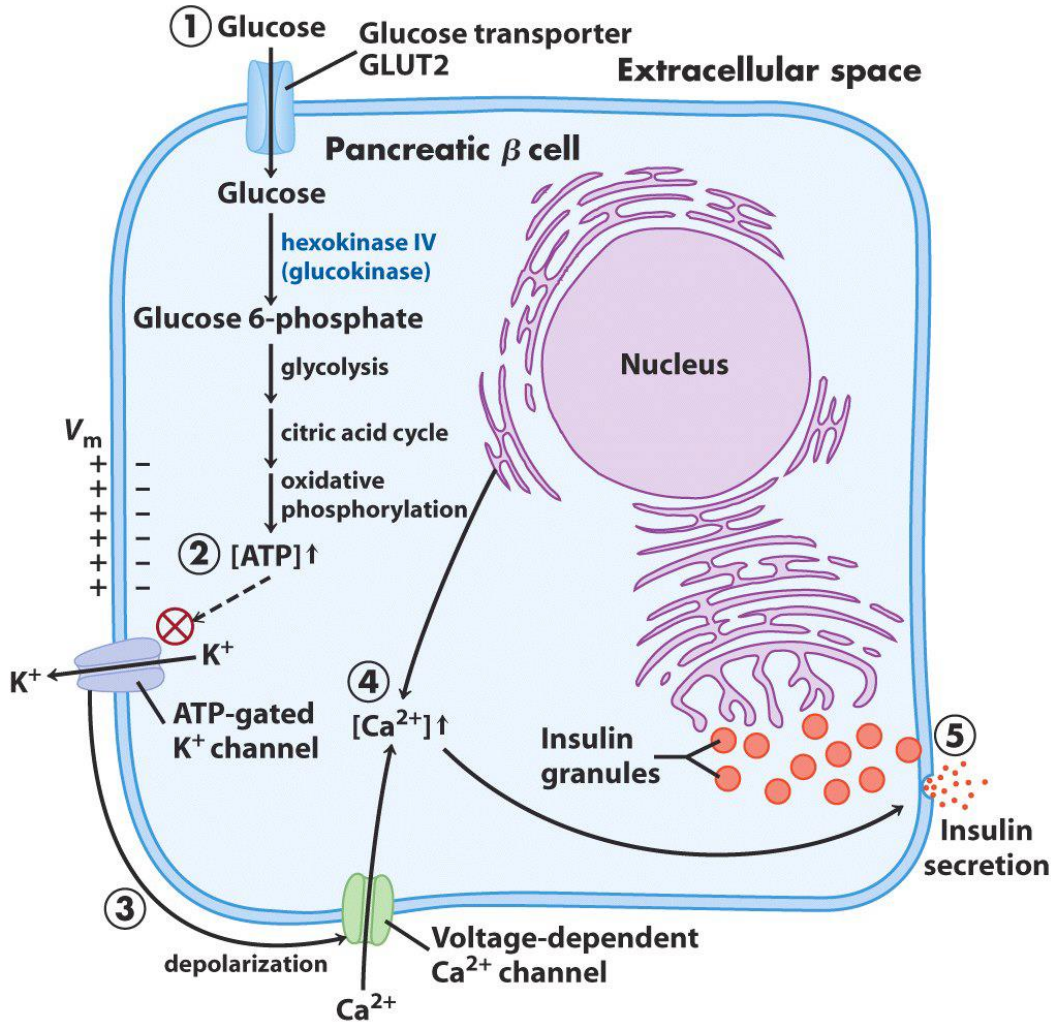
Biossíntese → Estocagem → Secreção → Transporte  
→ Reconhecimento → Amplificação → Resposta →  
Degradação

# Biossíntese de Insulina

- Peptídeo de duas cadeias, sintetizado como proinsulina
- Armazenado em grânulos de secreção

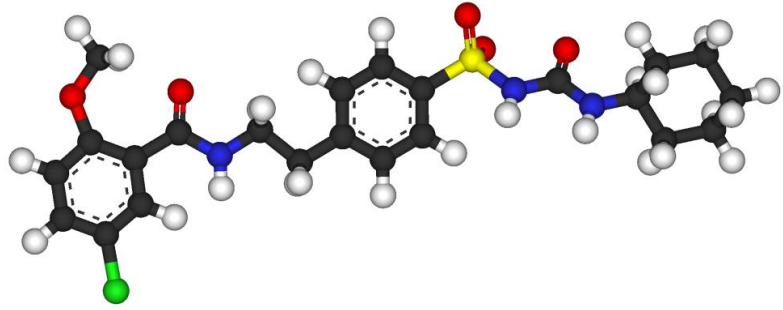


# Secreção de Insulina

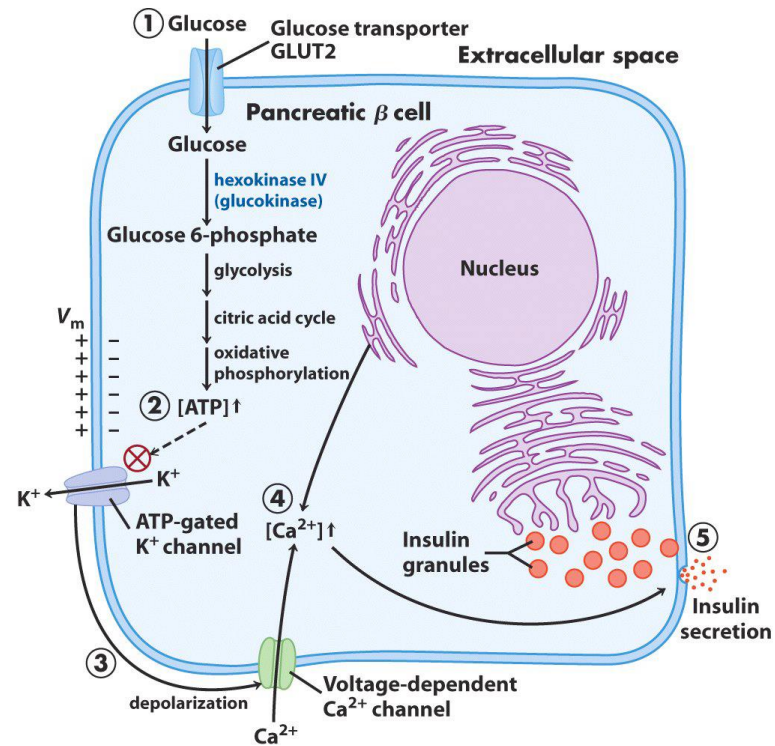


- Células  $\beta$  possuem GLUT2
- Células  $\beta$  possuem glicoquinase
- $\uparrow$  glicemia =  $\uparrow$  ATP
- ATP inibe canais para  $K^+$
- Despolarização
- Ativação da entrada de  $Ca^{2+}$
- Secreção de insulina
- Síntese de insulina

# Sulfoniluréias no Tratamento da DM II

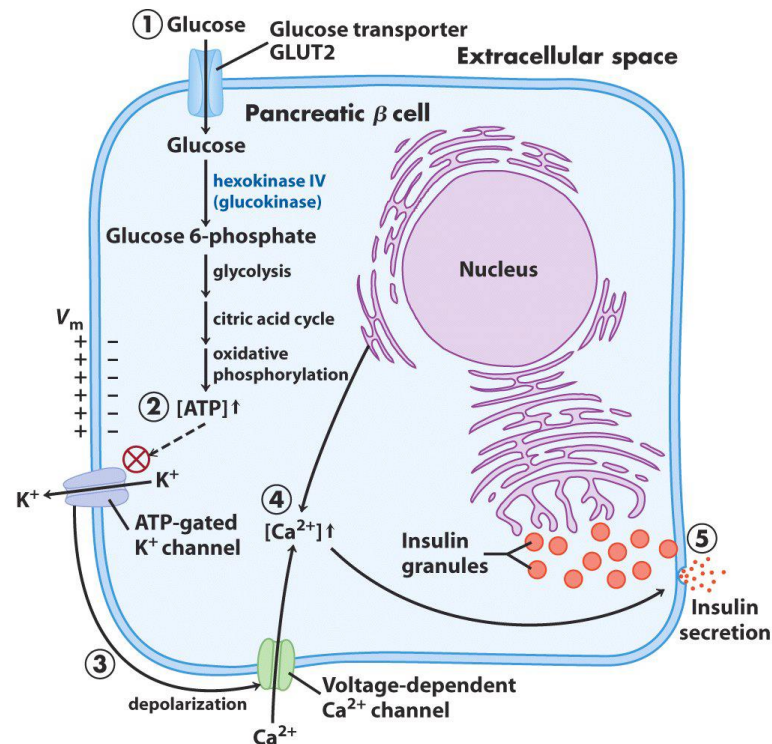
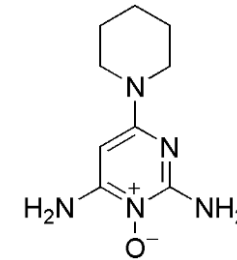
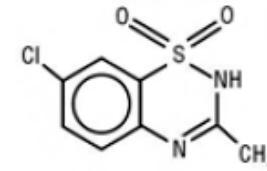


- Inibem canais para  $K^+$  sensíveis a ATP
- Aumentam secreção de insulina
- Eficazes em resistência periférica a insulina



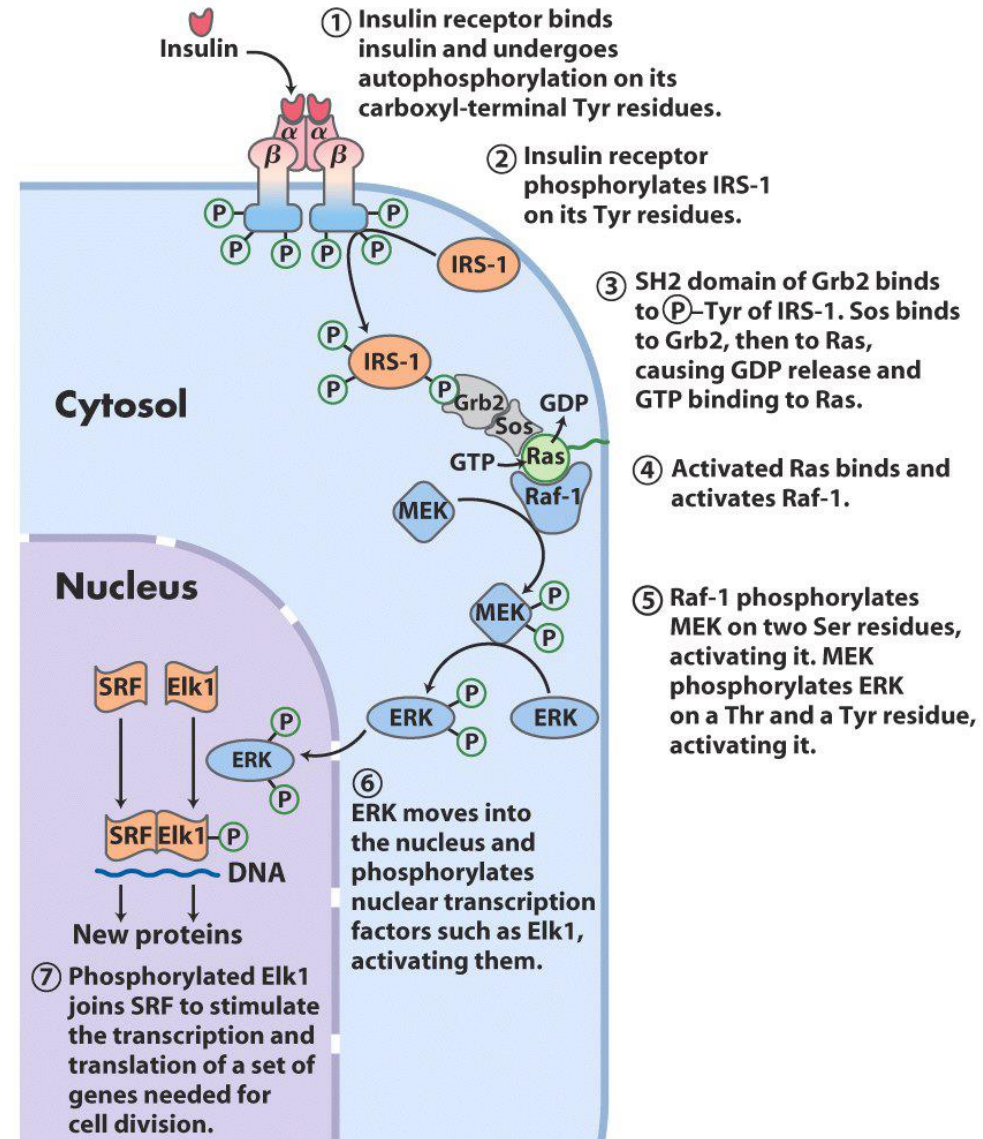
# Agonistas de $K_{ATP}$ s na Hiperinsulinemia

- Insulinomas levam a hiperinsulinemia e hipoglicemia
- Tratamento definitivo = remoção cirúrgica
- Tratamento medicamentoso = ativadores de  $K_{ATP}$ s



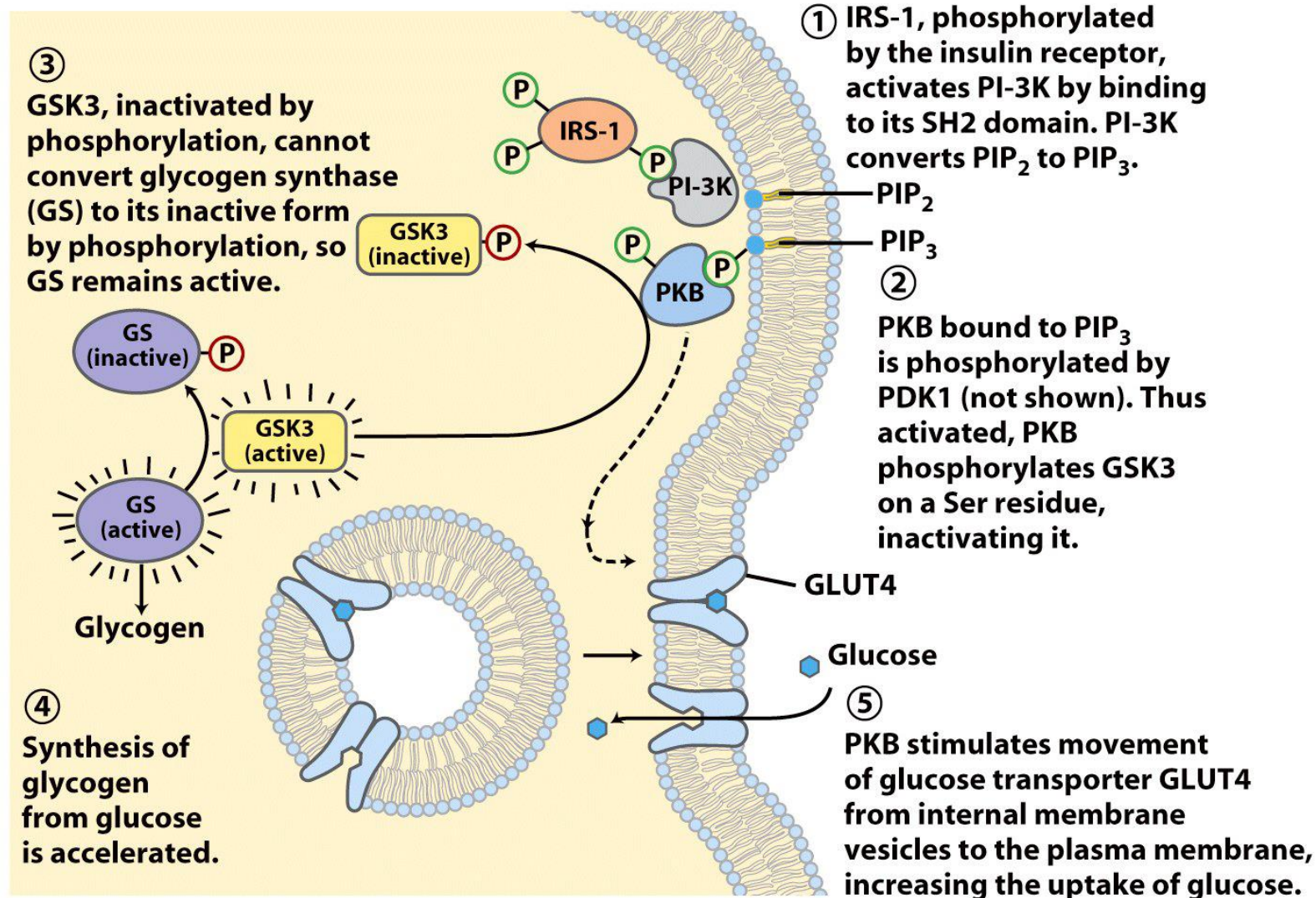
# Insulina e Receptores Tirosina Quinase

- Receptor contém dímeros  $\alpha$ , onde se liga a insulina
- Subunidades  $\beta$  se autofosforilam
- Ativada a ação tirosina quinase sobre outros substratos
- IRS-1 é fosforilado

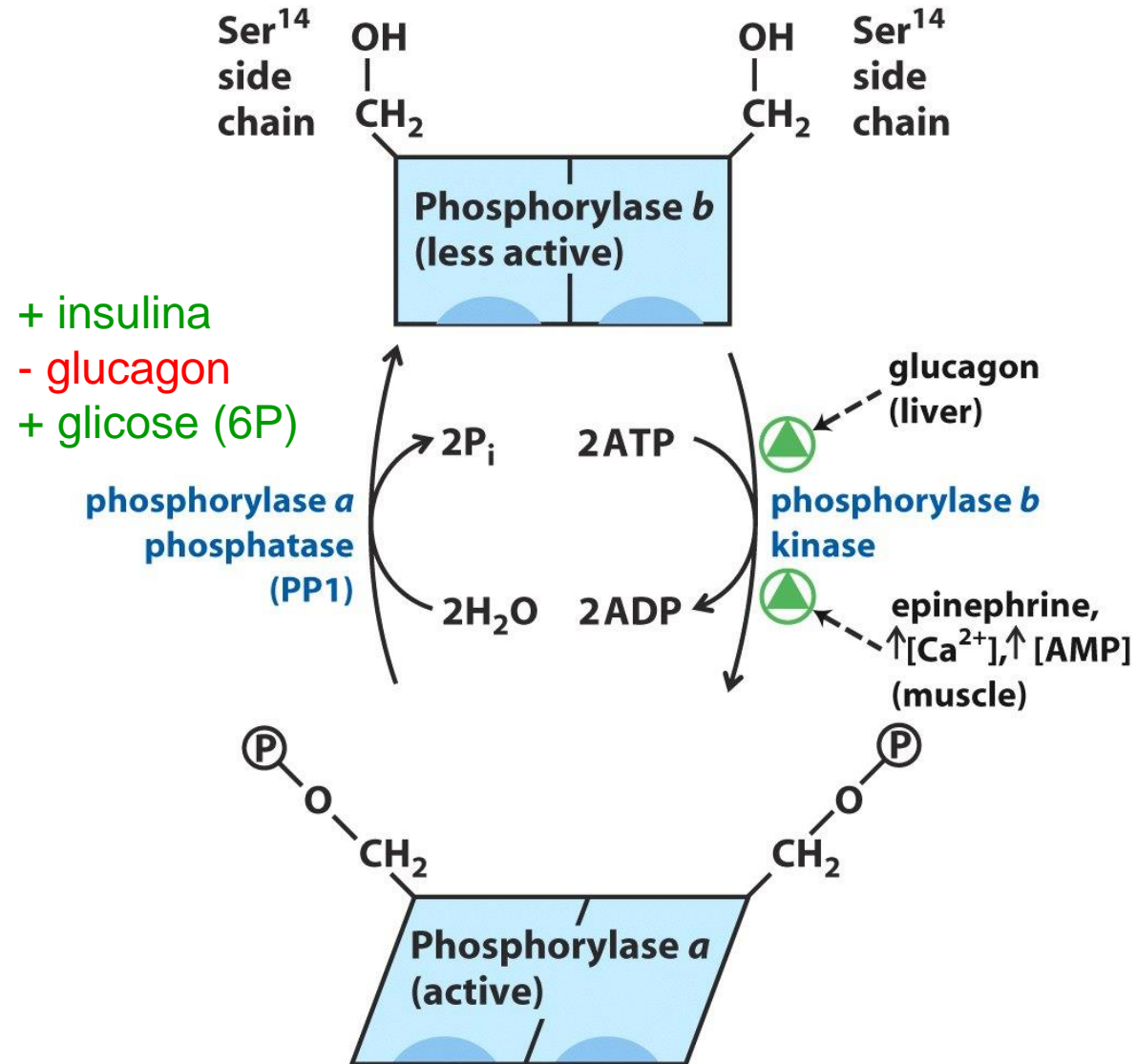


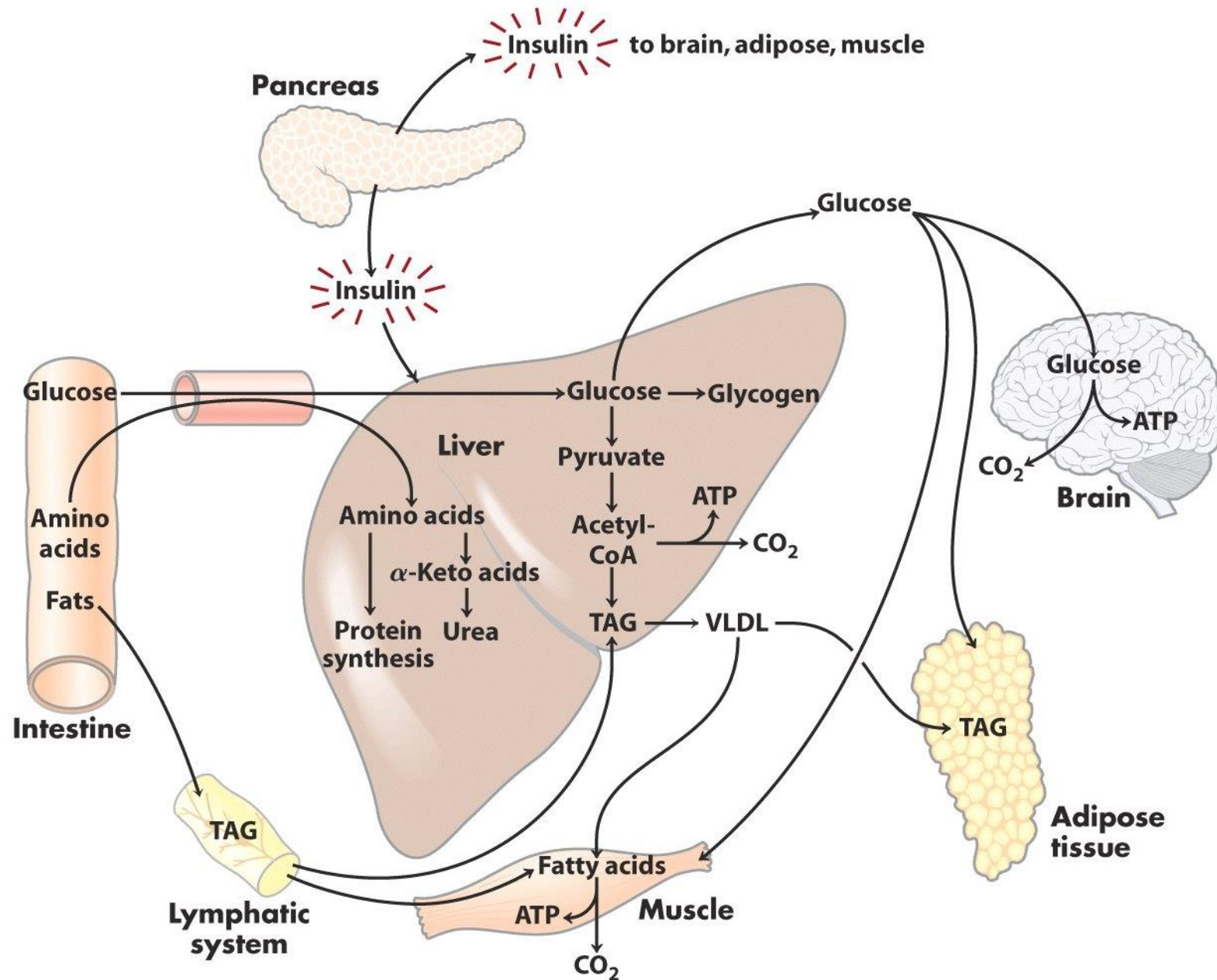


# Insulina – Efeitos Sobre Metabolismo de Glicogênio



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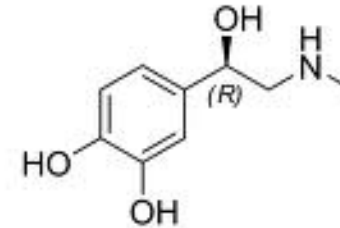






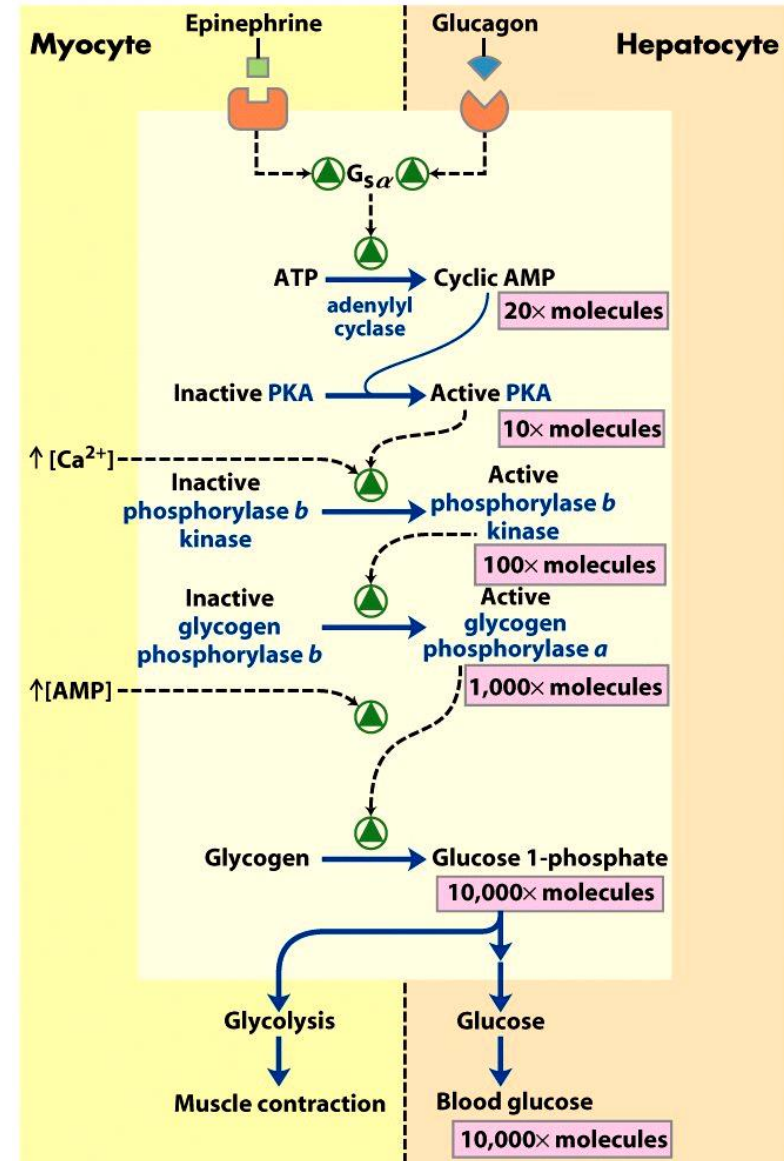
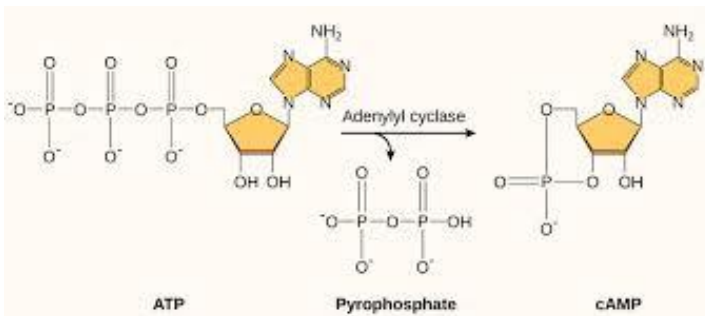
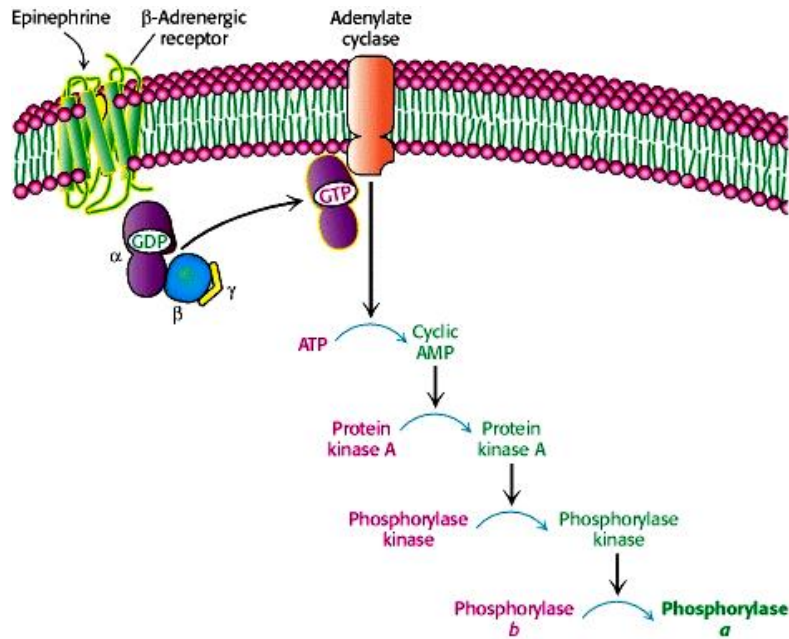
# Biossíntese e Secreção de Adrenalina (Epinefrina)

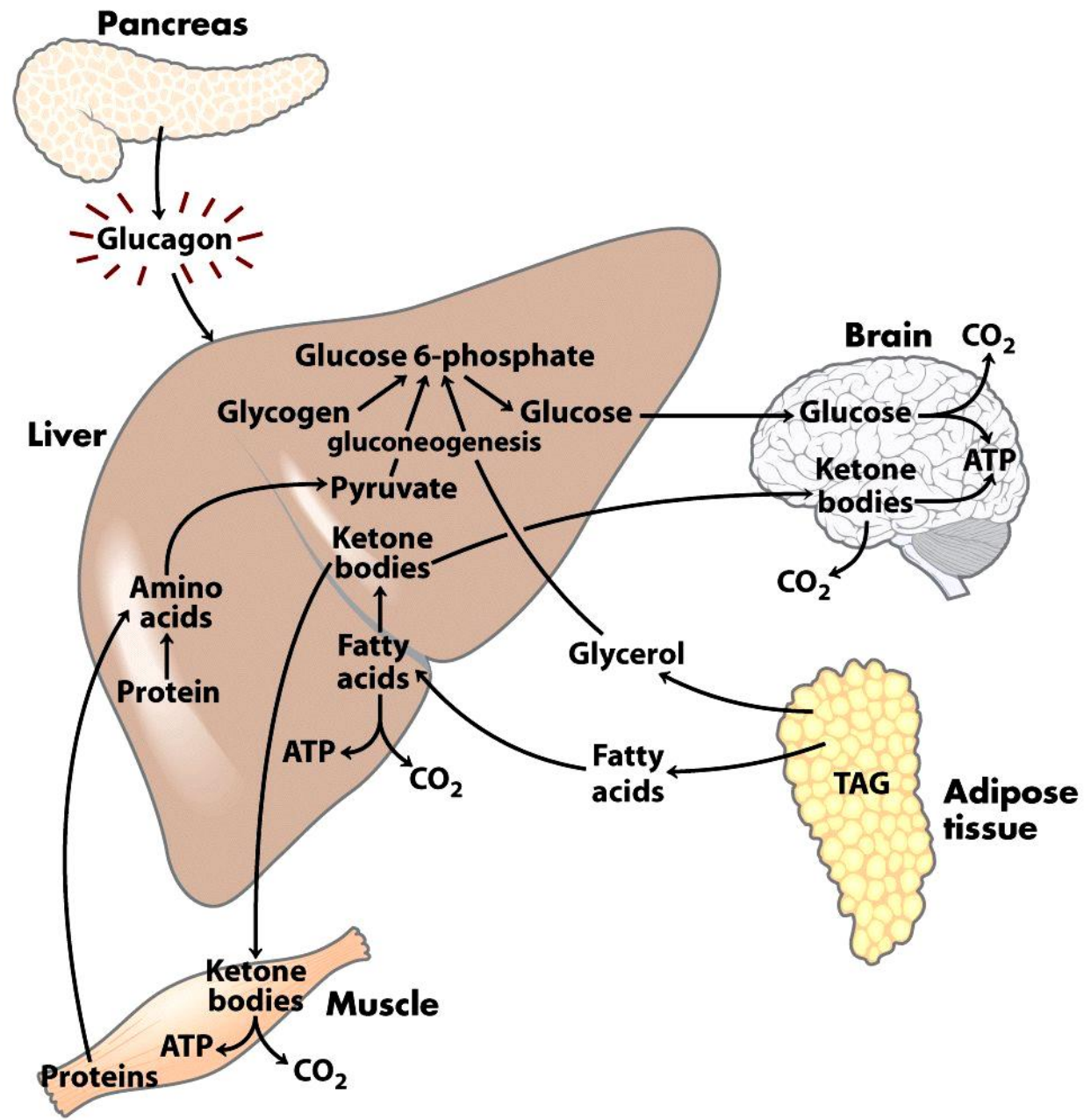
- Sintetizado na adrenal
- Precursores: fenilalanina e tirosina
- Primeiro hormônio biossintético (não-peptídico)
- Usado clinicamente em parada cardíaca, choque, anafilaxia



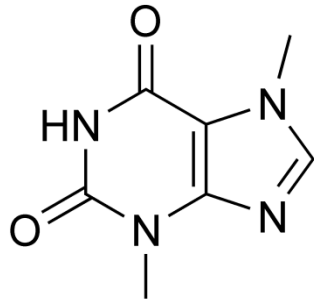
# Efeitos Periféricos do Glucagon e Adrenalina

- Receptores de 7 hélices
- Acoplados a proteínas G
- Cerca de 50% dos medicamentos agem por Prot. G!

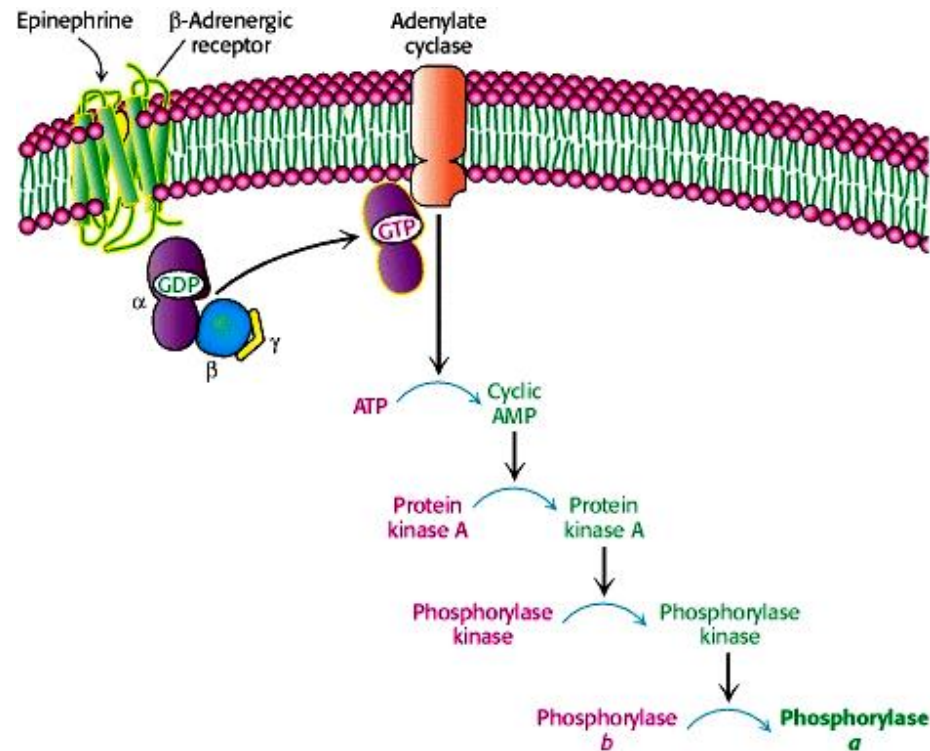
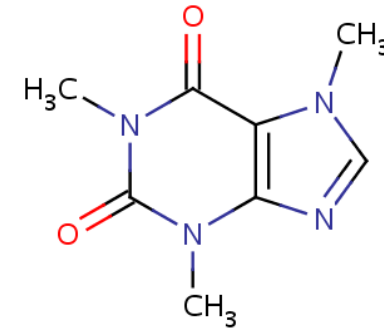




# Teobromina e Cafeína



- Inibidores da fosfodiesterase
- Aumentam AMPc
- Aumentam efeitos da adrenalina
- Promovem emagrecimento

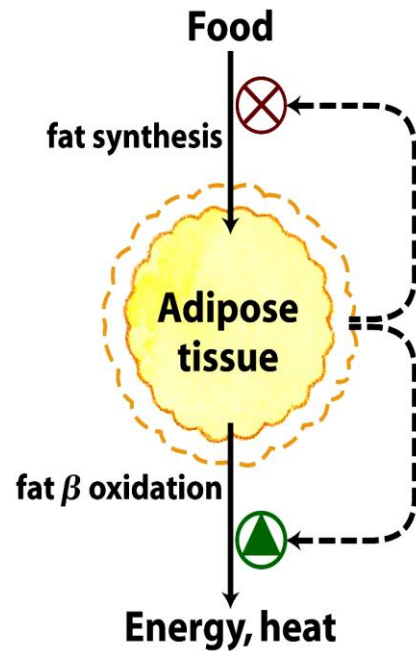




# Controle da Massa Corporal

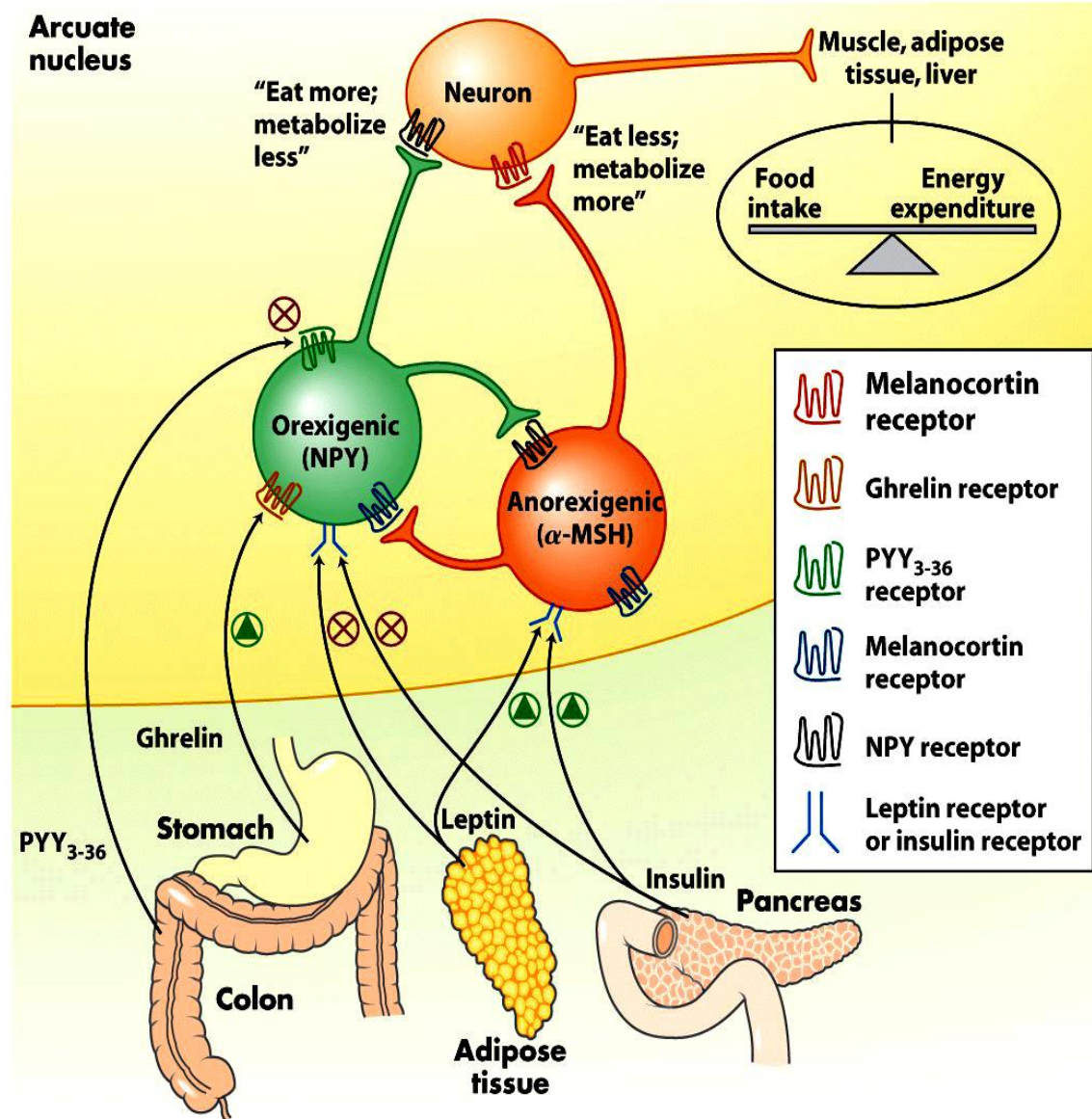
Leptina – produto do gene OB

## Teoria lipostática

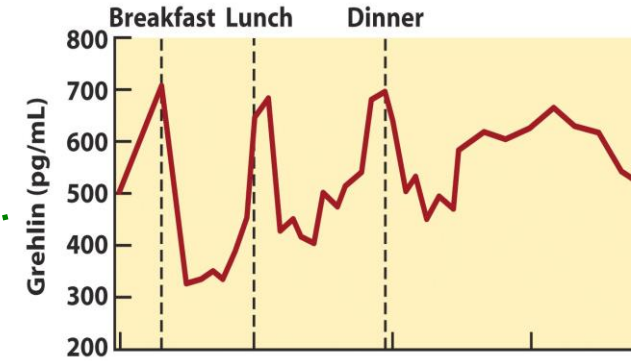
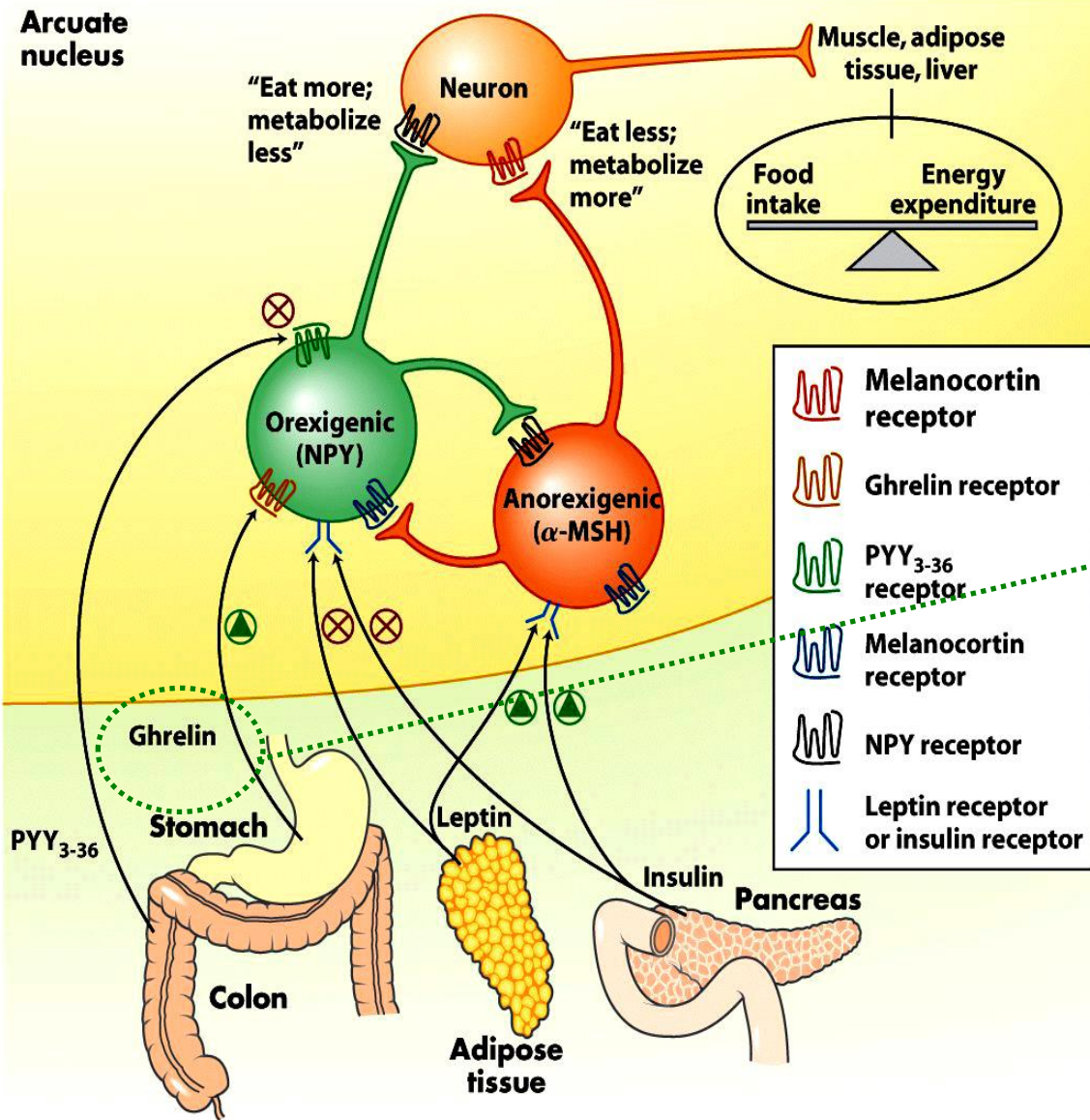


Apetite voraz  
Obesidade  
Síndrome metabólica  
Sensibilidade ao frio

# Modulação do Apetite



# Modulação do Apetite – Grelina e PYY

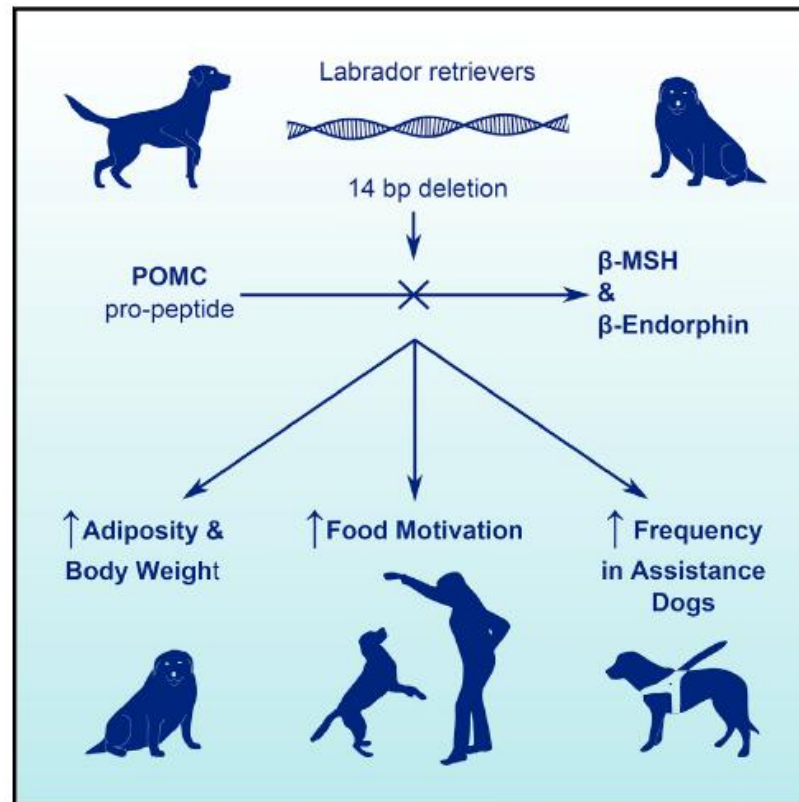


# Modulação do Apetite e Evolução Canina

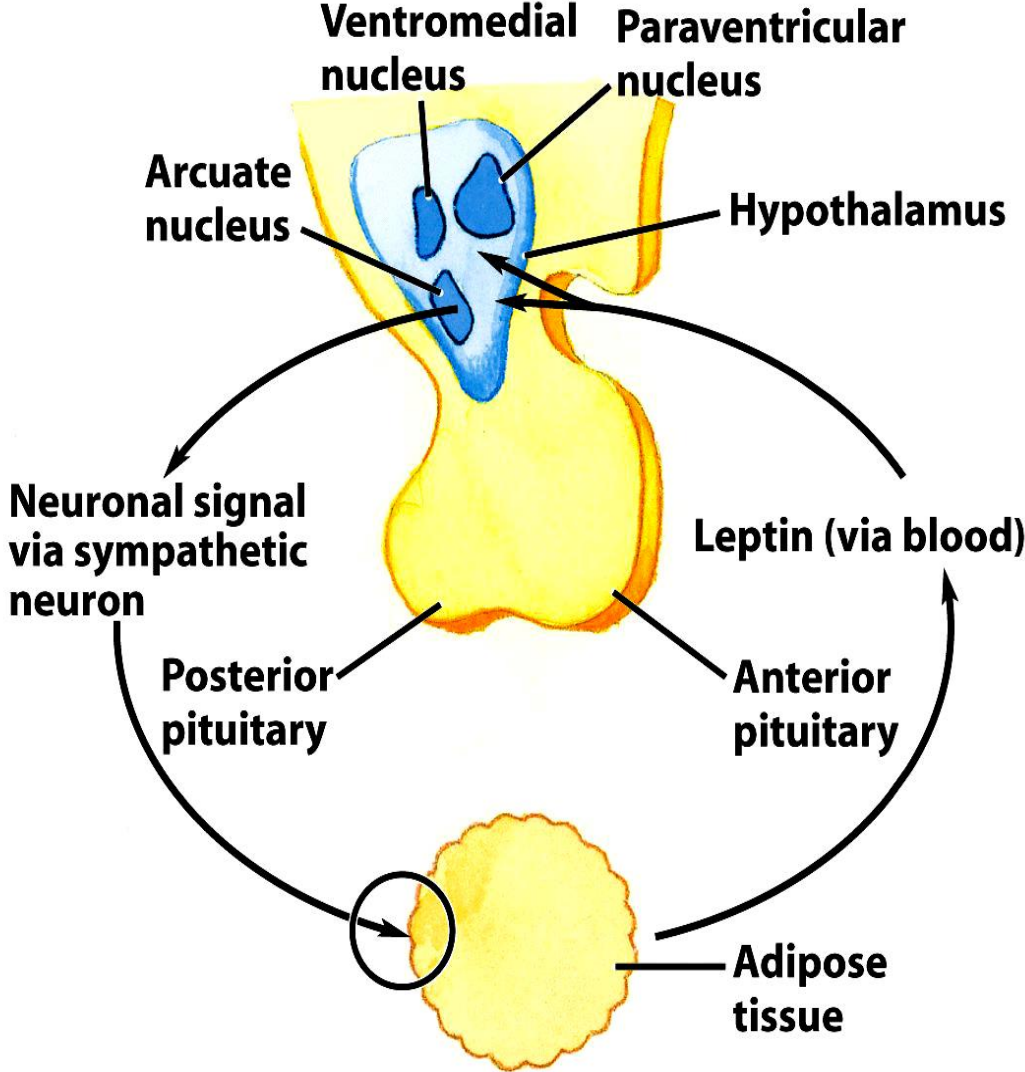
Short Article

## Cell Metabolism

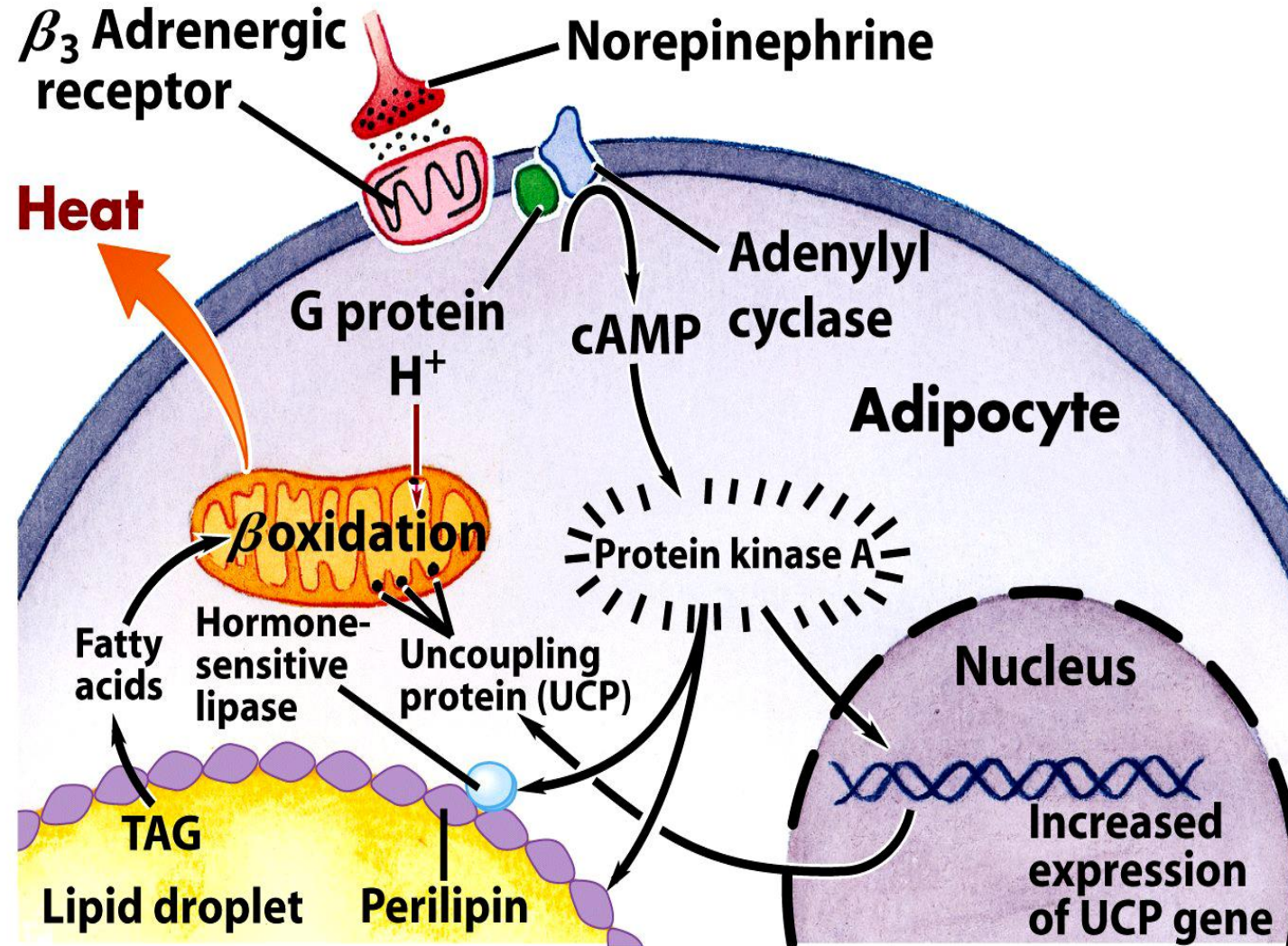
### A Deletion in the Canine *POMC* Gene Is Associated with Weight and Appetite in Obesity-Prone Labrador Retriever Dogs



# Leptina



# Leptina - Efeitos Periféricos



# Porcos Não Tem Termorregulação por Leptina

## The Uncoupling Protein 1 Gene (*UCP1*) Is Disrupted in the Pig Lineage: A Genetic Explanation for Poor Thermoregulation in Piglets

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<sup>1</sup> Department of Medical Biochemistry and Microbiology, Uppsala University, Uppsala, Sweden, <sup>2</sup> Department of Animal Breeding and Genetics, Swedish University of Agricultural Sciences, Uppsala, Sweden

## Pig has no uncoupling protein 1

Lianjie Hou<sup>a</sup>, Jia Shi<sup>a</sup>, Lingbo Cao<sup>a</sup>, Guli Xu<sup>a</sup>, Chingyuan Hu<sup>b</sup>, Chong Wang<sup>a,\*</sup>

<sup>a</sup> National Engineering Research Center for Breeding Swine Industry, Guangdong Provincial Key Lab of Agro-Animal Genomics and Molecular Breeding, College of Animal Science, South China Agricultural University, Guangzhou, Guangdong, 510642, PR China

<sup>b</sup> Department of Human Nutrition, Food and Animal Sciences, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, 1955 East-West Road, AgSci. 415J, Honolulu, HI 96822, USA



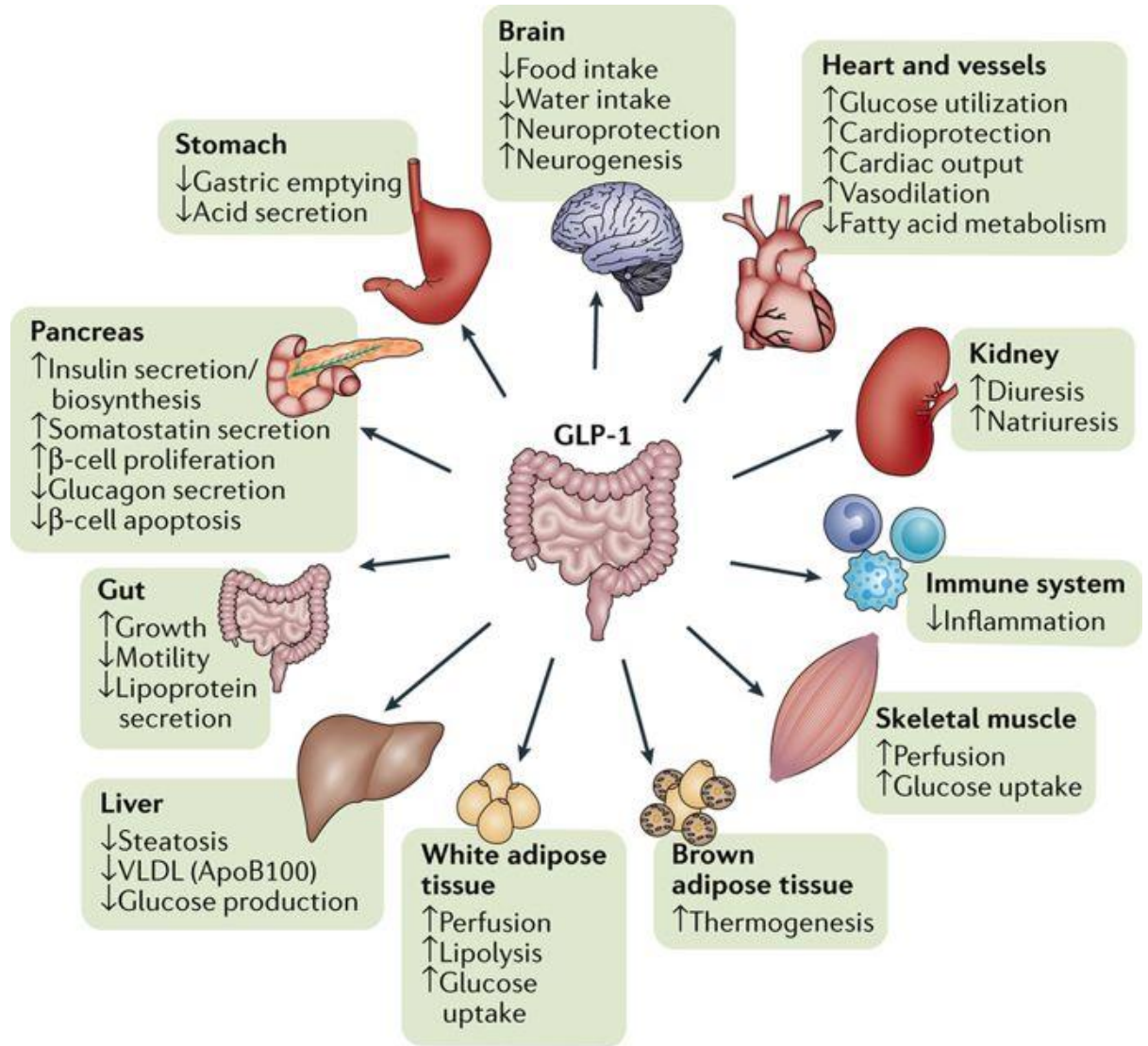
# Leptina – Solução para Obesidade?



- Maioria dos humanos obesos tem excesso de leptina
- Tratamento com leptina não reduz massa corporal
- Defeitos demonstrados em receptores (DB) e sinais de resposta



# Novos moduladores de apetite





Próximas aulas: - Especialização tecidual  
- Integração/revisão  
- Doenças

