

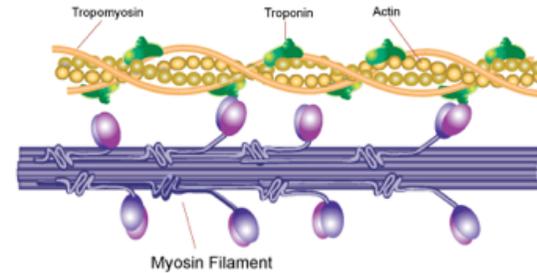
Thyroid Basics: What is Thyroid Hormone Doing?

Stimulation of cellular constituents by T3:

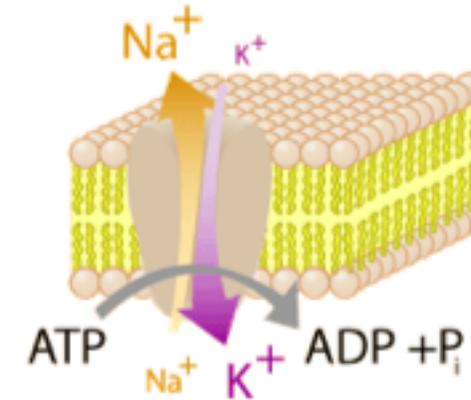
mitochondria



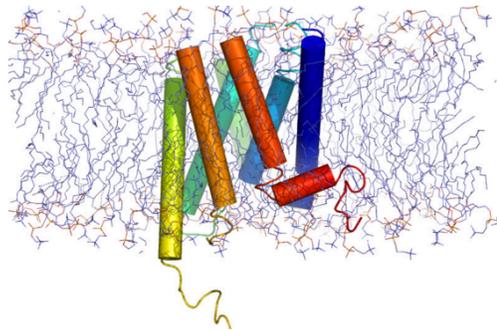
myosin ATPase



Na⁺-K⁺-pump



adrenergic b-receptors



many enzyme systems and proteins for growth and maturation including CNS development.

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Thyroid Basics: What is Thyroid Hormone Doing?

Thyroid hormones stimulate oxygen consumption in almost all cells.

Thyroid hormones stimulate the rate of

- hepatic glucose output and peripheral glucose utilization,
- hepatic metabolism of fatty acids, cholesterol and triglycerides,
- the synthesis of important proteins
- (the Na⁺-K⁺-pump, respiratory enzymes, erythropoietin, β -adrenergic receptors, sex hormones, growth factors etc),
- the absorption of carbohydrates in the intestine
- and the gut excretion of cholesterol,
- the modulation of reproductive function.

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Thyroid Basics: What is Thyroid Hormone Doing?

The many rate-stimulating effects are summarized in an overall increase in oxygen consumption.

This slow - but long lasting - calorogenic and thermogenic effect is confined to the mitochondria.

The thyroid hormones and the catecholamines work together in metabolic acceleration.

Thyroid hormones increase cardiac rate and output as well as ventilation.

The high basal metabolic rate raises the core and shell temperature, so that the peripheral vessels dilate. This vasodilatation forces the cardiac output to increase.

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Thyroid hormone has “Permissive” effects:

Permissiveness In biology is a biochemical phenomenon in which the presence of one hormone is required in order for another hormone to exert its full effects on a target cell.
[Wikipedia, the free encyclopedia]

Thyroid hormone increases the number of receptors available for epinephrine at the latter's target cell, thereby increasing epinephrine's effect on that cell.

Epinephrine would have only a weak effect without the thyroid hormone, Cortisol exerts a permissive effect on growth hormone.

Sherwood, Lauralee. "Ch18". In Peter Adams. Human physiology from cells to systems (6th ed.). Thomson Brooks/Cole. ISBN 0-495-01485-0.