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The physiology and metabolism of the Thyroid

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Thyroid hormone is indispensable for normal development and metabolism of most cells and tissues. Thyroid hormones are metabolized by different pathways: glucuronidation, sulfation, and deiodination, the latter being the most important. Three enzymes catalyzing deiodination have been identified, called type 1 (D1), type 2 (D2) and type 3 (D3) iodothyronine deiodinases. D1 and D2 have outer ring deiodinase activity, converting the prohormone T4 to its bioactive form T3 and degrading rT3 to 3,3'-T2. D3 has inner ring deiodinase activity and degrades T4 to rT3 and T3 to 3,3'-T2.D1 is largely expressed in liver and kidney. Its main role is clearance of rT3 from the circulation and it also contributes to production of plasma T3. D2 is importantly expressed in the central nervous system, pituitary, brown adipose tissue and muscle and, generally, its expression reciprocally responds to changes in thyroid state. D2 serves to adapt cellular thyroid state to changing physiological needs. D3 is importantly expressed in fetal tissues and in adult brain tissue. In addition, D3 can be re-expressed under certain pathological conditions such as critical illness or in specific cancers.In recent years, the paradigm has evolved that D2 and D3 can locally modify thyroid hormone bioactivity independent of serum thyroid hormone concentrations. Its physiological relevance has been shown in various developmental and regenerative conditions. Future studies may reveal if modifying (local) deiodinase activity can be of use under certain circumstances.

Biography

RoSeé Murphy is studying at both NASM and UMGC. She practices mostly holistic approaches. Her expertise was originally Information Technology, where she has put in over 20 years. It was at the beginning of her professional career that RoSeé began to experience the most horrific side effects of a malfunctioning thyroid. She has encountered many thyroid disorders. She changed her lifestyle after having endless panic attacks and generalized anxiety disorder. She began studying the very gland that crippled her life for over 20 years. She had her thyroid removed on September 13,2021, which is the day she explains, "The motor in my body stopped running." She has been studying thyroid explicitly for over 6 years now.