

## Question #61719, Biology, Human Anatomy and Physiology

**What is the function of reverse triiodothyronine?**

**Answer:**

Reverse triiodothyronine (3,3',5'-triiodothyronine, reverse  $T_3$ , or  $rT_3$ ) is an isomer of triiodothyronine (3,5,3' triiodothyronine,  $T_3$ ). It is a type of hormone that is produced by the thyroid gland. It comes from the conversion of the storage hormone  $T_4$ .

Reverse triiodothyronine participate in regulating metabolism.

In particular, there are many different situations in which reverse triiodothyronine levels may be raised. It is known that, in the fetus, larger amounts of reverse  $T_3$  are created, together with lower levels of triiodothyronine. Levels of reverse  $T_3$  drop several weeks after birth to match those of normal adults. Fasting initially causes a fall in  $T_3$  and an increase in reverse  $T_3$ , while longer-term starvation sees reverse triiodothyronine levels returning to normal. Overeating has the opposite effect, with a rise in  $T_3$  and a decrease in  $rT_3$ .

Certain drugs can affect deiodinase enzymes, inhibiting their actions and leading to a decrease in the conversion of  $T_4$  to  $T_3$  in the body's tissues, and a deficiency of selenium can have a similar effect. In what is referred to as euthyroid sick syndrome, serious illnesses such as cancer, kidney and liver failure, heart attacks, infections and burns suppress deiodinase enzymes. This means that it can be difficult to assess thyroid function in people who are gravely ill, as the levels of thyroid hormones may be abnormal in the absence of thyroid disease. In euthyroid sick syndrome, even though the amount of  $T_3$  produced by the thyroid gland remains the same, decreased conversion in the tissues causes a reduction in the overall level of  $T_3$ . Less reverse  $T_3$  is cleared from the body, with the result that reverse triiodothyronine levels increase.

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