

THYROID PHYSIOLOGY

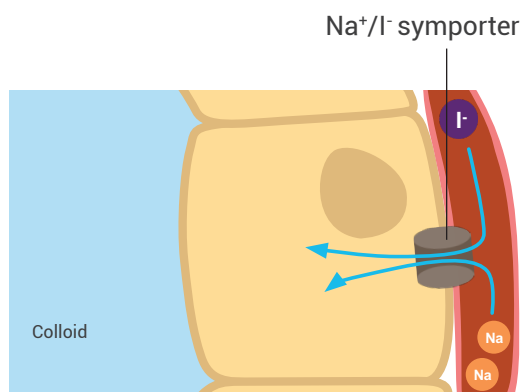
Grasping thyroid hormone production

The thyroid produces two forms of thyroid hormone: T4 which is an inactive "prehormone" and T3 which is the active form of thyroid hormone. Of the hormone produced, 80% is T4 and 20% is T3.

Iodine is a key component of thyroid hormone, and iodine deficiency results in low levels of thyroid hormone. Thyroid hormone is produced in the follicular cells of the thyroid. There are four steps in production:

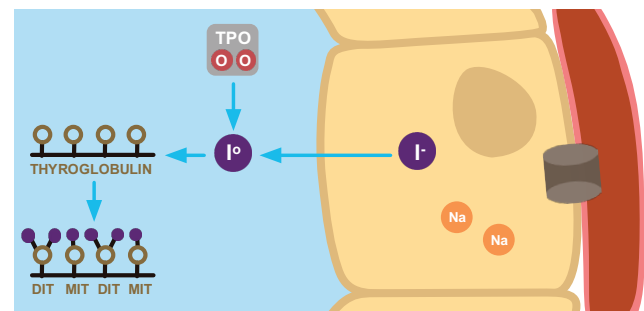
1. Iodine uptake

into the cell via the Na^+/I^- symporter.



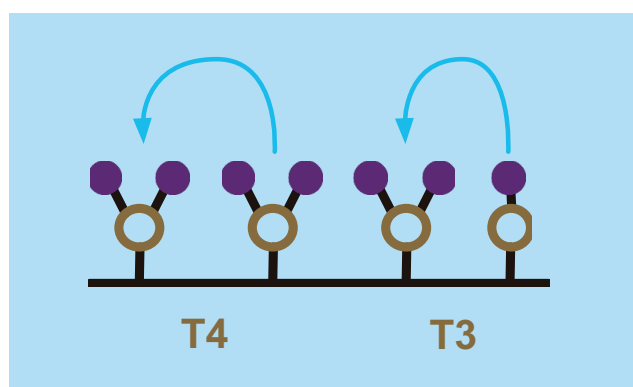
2. Oxidation

of iodine by the TPO enzyme, and binding of iodine to thyroglobulin (the backbone of the thyroid hormone molecule). This forms the thyroid hormone precursors MIT (one iodine) and DIT (two iodines).



3. Coupling

of DIT and MIT to form T3 (three iodine moieties) and T4 (four iodine moieties).



4. Release

of thyroid hormone into the blood stream, with proteolysis removing and recycling the thyroglobulin molecule.

