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*Modeling slow growth of thyroid nodules and initiation of cancer.*

Hashimoto's thyroiditis is an autoimmune disorder of the thyroid gland in which the immune system produces antibodies and attacks the tissue of thyroid gland and disrupts normal function of the HPT axis. As a result, thyroid stimulating hormone (TSH) increases, thyroxine (FT4) decreases and the functional size of thyroid gland decreases over time. Thyroid nodules coexist with Hashimoto's thyroiditis and grow slowly as TSH increases above normal value ( $> 4$  mU/L). About 5-15% of thyroid nodules becomes cancerous. In this talk, we present a stochastic model for the formation of thyroid nodules and initiation of cancer in nodules for patients with Hashimoto's thyroiditis. (Received September 20, 2016)