# Dynamical Analysis of the Fractional-Order Mathematical Model of Hashimoto's Thyroiditis

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**Abstract :** The present work intends to analyze the system dynamics of Hashimoto's thyroiditis with the assistance of fractional calculus. Hashimoto's thyroiditis or chronic lymphocytic thyroiditis is an autoimmune disorder in which the immune system attacks the thyroid gland, which gradually results in interrupting the normal thyroid operation. Consequently, the feedback control of the system gets disrupted due to thyroid follicle cell lysis. And, the patient perceives life-threatening clinical conditions like goiter, hyperactivity, euthyroidism, hyperthyroidism, etc. In this work, we aim to obtain the approximate solution to the posed fractional-order problem describing Hashimoto's thyroiditis. We employ the Adomian decomposition method to solve the system of fractional-order differential equations, and the solutions obtained shall be useful to provide information about the effect of medical care. The numerical technique is executed in an organized manner to furnish the associated details of the progression of the disease and to visualize it graphically with suitable plots.