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Dynamics of a simplified HPT model

We propose a simplified mathematical model of the hypothalamus-pituitarythyroid (HPT) axis in an endocrine system. The considered model is a modification of the model proposed by Mukhopadhyay and Bhattacharyya in [2]. Our system of delay differential equations reconstructs the HPT axis in relation to 24h profiles of human in physiological conditions. Homeostatic control of the thyroid-pituitary axis is considered by using feedback and delay in our model. The influence of delayed feedback on the stability behaviour of the system is discussed.

References

[1] A. Bartłomiejczyk, B. Jackowska-Zduniak, *Dynamics of a simplified HPT model in relation to 24h TSH profiles*, Mathematica Applicanda 46(1) (2018), 13–24, doi=10.14708/ma.v46i1.6389.

[2] B. Mukhopadhyay, R. Bhattacharyya, *A mathematical model describing the thyroid-pituitary axis with time delays in hormone transplantation*, Appl. Math. 51(6) (2006), 549–564.