

# Dynamical analysis of fractional-order of IVGTT glucose-insulin interaction

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## Abstract

In this paper, we investigate the dynamics of a fractional nonlinear differential equation glucose-insulin system that arise in Bergman's minimal model, used to describe blood glucose and insulin metabolism, after intravenous tolerance testing. We also discuss the stability and existence, uniqueness, non-negativity and boundedness of the solution. Moreover, we adapted the shifted Jacobi Gauss Radau collocation (SJ-GR-C) method for the fractional-order of IVGTT glucose-insulin interaction. Furthermore, numerical simulations are carried out to illustrate the main theoretical results.

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figures/Glucose1/Glucose1-eps-converted-to.pdf

figures/Glucose2/Glucose2-eps-converted-to.pdf

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