



## Seminari di Dipartimento BIOMORF

**Mercoledì 25 Giugno 2025 - ore 15:30**

*Aula De Simone, piano I-Torre Biologica (Pad. G), A.O.U. "G. Martino"*

### PRESENTAZIONE DELL'EVENTO

**Prof. Sergio Lucio Vinci**

*Direttore Dipartimento BIOMORF, Università degli Studi di Messina*

### INTRODUZIONE

**Prof. Armando Ciancio**

*Dipartimento BIOMORF, Università degli Studi di Messina*

### RELATORE

**Prof. Haci Mehmet Baskonus**

Department of Mathematics and Science Education,  
Faculty of Education, Harran University, Sanliurfa, Turkey

## On the Dynamics of HIV-TB Co-Infection Model with Temporal Recovery from TB: An Analysis

The current study is an attempt to frame a deterministic compartmental model for HIV-TB coinfection, considering temporary recovery from Tuberculosis (TB) after treatment (the possibility of re-infection with TB even after recovery). The proposed HIV-TB co-infection model is a composite of an SI (Susceptible-Infected) type HIV/AIDS model and an SEIR (Susceptible-Exposed-Infected-Recovered) type TB model. In the beginning, the HIV – TB model is constructed, followed by the qualitative investigation of the model. The equilibrium points of the model are obtained and have been examined in detail. Further, the basic reproduction number for the HIV-TB co-infection model has been computed, and the proposed model has been simulated numerically to investigate the effect of treatment on HIV-TB co-infection. Analysis of the model claims the existence of interior equilibrium when both HIV and TB reproduction numbers are more than unity. The results exhibit that TB treatment will be the most efficient in discarding the HIV-TB co-infection disease whenever the basic reproduction of HIV-TB is less than one. In addition, our results suggest that the re-infection of TB after recovery impacts HIV-TB transmission. It has been found that re-infection makes disease eradication more challenging. As, in the presence of re-infection, the total infected cases are always higher than the infected cases in the absence of re-infection.