

**UNIVERSITI TEKNOLOGI MARA**

**THE PROPAGATIONS OF SATURATING  
FEEDBACK MECHANISM COLORECTAL  
CANCER MATHEMATICAL MODEL**

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**BACHELOR OF SCIENCE (Hons.) MANAGEMENT  
MATHEMATICS**

**JULY 2022**

**Universiti Teknologi Mara**

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Feedback Mechanism Colorectal  
Cancer Mathematical Model**

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**Report submitted in fulfilment of the requirements  
for Bachelor of Science (Hons.) Management  
Mathematics Faculty of Computer and  
Mathematical Sciences**

**July 2022**

**SUPERVISOR'S APPROVAL**

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MECHANISM COLORECTAL CANCER MATHEMATICAL  
MODEL**

**BY**

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This report was prepared under the direction of supervisor, Dr Nur Izzati Khairudin. It was submitted to the Faculty of Computer and Mathematical Sciences and was accepted in partial fulfilment of the requirements for the degree of Bachelor of Science (Hons.) Management Mathematics.

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JULY, 2022

## ABSTRACT

Mathematical model of colorectal cancer is required to gain a better understanding of colorectal cancer and to provide insights into more effective of its early treatment strategies. Although the nature of cancer is complex, a mathematical model for tumour growth has assisted researchers in understanding and categorising the illness's behaviour. Therefore, this report looks into the propagations of saturating feedback mechanism colorectal cancer mathematical model. Moreover, we want to use Euler's method to examine and observe a system of ordinary differential equations as some parameters vary. In this research we used two mechanisms that could influence the growth of colon cancer. The first mechanism is saturating mechanism in which we vary the parameter  $m_1 = 0.07$ ,  $k_1 = 0.04$ ,  $\beta = 0.357$  and  $\gamma = 0.155$  according to the given range. Following that is the linear and saturating mechanism in which we only vary parameter  $k_0 = 0.06$ ,  $m_0 = 0.07$  and  $\gamma = 0.1345$ . In saturating feedback mechanism, the result for present research shows that our values of steady-state for cell populations are  $N_0^* = 4$ ,  $N_1^* = 166$  and  $N_2^* = 883$ . For linear and saturating mechanism, the value of cell population growth is slightly faster than previous research which are  $N_0^* = 5$ ,  $N_1^* = 168$  and  $N_2^* = 1358$ . Thus, we observed that in linear and saturating feedback mechanism has escalation in  $N_2$  which is higher than saturating feedback mechanism. Besides, the exponential growth of tumour faster than the previous studies. This means that oncologist can predict and detect the evolvement of tumor in one patient. Moreover, by using this mathematical model, oncologists can proceed the next process to give a treatment to the cancer patients.

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