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Effects of Estrogen Contamination on Human Cells: Modeling and Prediction Based on Michaelis-Menten Kinetics

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ABSTRACT

In this paper, we propose a novel prevention strategy to alert citizens when water is contaminated by estrogen. Epidemiological studies have shown that chronic exposure to high blood level of estrogen is associated with the development of breast cancer. The preventive strategy proposed in this paper is based on the prediction of estrogen effects on human living cells. Based on first principle insights, we develop in this work, a mathematical model for this prediction purpose. Dynamic measurements of cell proliferation response to estrogen stimulation were continuously monitored by a real-time cell electronic sensor (RT-CES) and used in order to estimate the parameters of the model developed.

KEYWORDS

Water Protection, Early Warning, Estrogen, Mathematical Modeling, Parameter Estimation, Prediction

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