

MATHEMATICAL + ONCOLOGY



WITH GUEST SPEAKER

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FIGHTING DRUG RESISTANCE WITH MATH

THURSDAY, NOVEMBER 7, 5 P.M.
SLOAN AUDITORIUM
GOERGEN HALL

The emergence of drug resistance is a major challenge in chemotherapy. This talk is an overview of some of the recent mathematical models for describing the dynamics of drug resistance in solid tumors. Under certain conditions, these models predict that multiple resistant traits emerge at different locations within the tumor, corresponding to heterogeneous tumors. Levy shows that a higher drug dosage may delay a relapse, yet, when this happens, a more resistant trait emerges. Levy will survey modern mathematical ideas for quantifying the fight against drug resistance in cancer.

Can math cure leukemia?

PUBLIC LECTURE

WEDNESDAY
NOVEMBER 6, 5 P.M.
SLOAN AUDITORIUM
GOERGEN HALL

Modern targeted therapies have significantly improved the treatment of chronic myelogenous leukemia (CML). Yet, most patients are not cured for undetermined reasons. In this talk, Levy shows how mathematical methods can be applied to model the immune response to CML. Along the way, he discusses cancer vaccines, drug resistance, and cancer stem cells. Levy demonstrates how mathematical methods can be used to integrate clinical and experimental data in order to guide treatment options.

IMMUNOTHERAPY: USING MATH TO HELP THE IMMUNE SYSTEM FIGHT CANCER

FRIDAY, NOVEMBER 8, 3:30 P.M.
SLOAN AUDITORIUM
GOERGEN HALL

It is reasonable to blame the immune system for cancer. After all, a “healthy” immune response is supposed to fight everything foreign to the body, including cancer cells. There are many reasons (active and passive) as of why the immune system may fail. Immunotherapy assumes that stimulating the immune system may work (possibly in conjunction with other therapies) to eradicate the cancer cells. Improving the immune system can be done in many different ways, ranging from infusing cytokines that activate immune cells through more modern approaches of engineering immune cells to target and fight specific cancers. In this talk, Levy shows how math may be the key for harnessing the complex dynamics of the immune system to fight cancer.