

# **Cell proliferation in tissues and optimization of anticancer drug delivery, updated**

Jean Clairambault  
INRIA Paris-Rocquencourt and  
INSERM Villejuif, France

The decay of cell proliferation in fast renewing tissues is the way, obtained in particular by pharmacological means, highly wanted in the case of tumors and avoided as much as possible in the case of healthy organs, by which anticancer drugs exert their action.

- 1) The targets, tumor and healthy proliferating cell populations, are represented by physiologically structured PDE cell population dynamic models.
- 2) The means, drugs, are represented by physiologically based PK-PD, i.e., pharmacological-pharmadynamic, ODE models.
- 3) Drug delivery is optimized under the constraint of limiting unwanted toxic side effects according to optimal control algorithms, technologically implementable in portable (ambulatory) programmable pumps that are already in use in the clinic.

I will describe advances and future prospects in these three research directions.