Growth Processes and Physiologically Structured Dynamics
Mathematical Analysis

B. Perthame
Laboratoire J.-L Lions, UPMC
and INRIA
`benoit.perthame@upmc.fr`

Abstract: Several Integro-Differential equations and Transport equations are used to describe growth processes in biological or medical modeling.

Lecture 1: Models of structured populations: cell populations structured by age, size, molecular content in some protein. The cell division cycle. An example: a model of neurone network.

Lecture 2: Perron-Froebenius theory, PDEs and and general relative entropy

Lecture 3: The case of size structured equation;

Lecture 4: Example of cancer: a general introduction; circadian rhythm, Floquet theory in PDEs. How to compare the growth processes with and without periodic control. Application to tumor growth and chronotherapy.

Lecture 5: Example of prion aggregates.