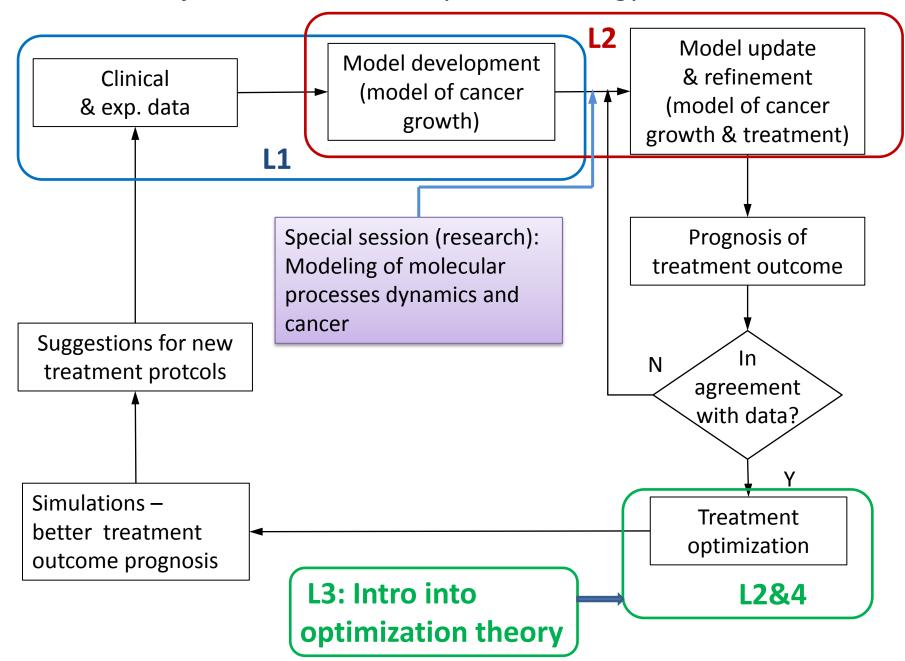# Jaroslaw Smieja, Silesian University of Technology, Gliwice, Poland

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Lecture 1 - Introduction:
- Motivation for modeling of cancer dynamics
- Sample clinincal & modeling results
- Compartmental models
- Modeling of cancer cell population growth with treatment
- Phase-specific chemotherapy models

Lecture 2 - Treatment as a control problem
- Phase-specific chemotherapy models
- Drug resistance modeling
- Antiangiogenic treatment model
- Combined therapies
- Immunotherapy
- Other
- Some optimization

Lecture 3 – Therapy optimization
- Mathematical problem statement
- Derivation of necessary conditions
- Methods of finding (sub-)optimal solutions

Lecture 4 – Infinite dimensional model of drug resistance
- Model development
- Analysis of model dynamics
- Transforming model description
- Treatment optimization

Special session (research):
Modeling of molecular processes dynamics and cancer
- Some issues in deterministic modeling of signaling pathways
- Crosstalk between heat-shock and NFkB pathways