„Modeling Multiscale Cardiovascular and Respiratory System Dynamics
August 22-26, 2011   N140 William H. Foege Building
University of Washington, Seattle, WA 98195
(EarlyDraft Syllabus 9aug11)

	830–1015 AM	*1030–1215 AM*	*1315–1500 PM*	*1515–1730 PM*
Monday 8:30 AM 22 August	Introductions: Bassingthwaighte Modeling overview Strategies, Objectives in Multi-scale Modeling Hands on: Login compartmental models, 2-comp exchanges M-M reaction	<u>Gary Raymond</u>: Dan Beard's Aquarium study <u>Butterworth</u>: JSim structure and function ----Download JSim------	<u>Gary Raymond</u>: Aspirin: discussion of hypotheses, modeling clearance by reaction Hands on: fit 3 data sets with one model <u>Bassingthwaighte</u>: Prog Curves: Xanthine Oxidase (Optimize) ODEs--Hands on:	Baasingthwaighte Lecture: Blood Tissue Exchange Multiple Indicator Dilution Expt Crone Extraction Data Mass Balance -work Time on fitting with PDEs –
Tuesday 8:30 AM 23 August	<u>Hong Qian</u>: Stochastic and Deterministic Modeling. Where do they intersect? 1. Stochastic chem 2. Gillespie algorithm	<u>Hong Qian</u>: Biochem Network Models and their analysis. Building biochem networks. Critical paths.	<u>Adam Alessio</u>: PET analysis, using 13N-NH3 to estimate regional blood flow distributions in dog and human hearts. Distributed and compartmental modeling. Data acquisition, ROI selection, and automating analysis w/ QPP	<u>Butterworth</u>: 1.Computing Platforms: Matlab, JSim, Modelica, PCEnv, etc <u>Lucian Smith</u>: 2. SBML, CellML JSim and others, incl. platform dependent ones. --Importing from CellML and SBML-
Wednesday 8:30 AM 24 August	<u>Joseph Anderson</u>: Modeling Pulmonary Mechanics and Gas Exchange I: modeling with electrical analogs Model Verification	<u>Joseph Anderson</u>: Modeling Pulmonary Mechanics and Gas Exchange II. spatially distributed permeation. Spatial profiles in capillary. Diffusion. Pendelluft (Lutchen)	<u>Max Neal</u>: CV-Resp System Model: Integrative Control. Built-in interventions	<u>Max Neal</u>: Extending the Model. Modularizing a model for repeated automated reconstructions.

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Thursday 8:30 AM 25 August	Herbert Sauro: Quantitative Synthesis of real Genetic Networks Working with Jarnac and SBML and Biomodels and CellML databases	Herbert Sauro: Quantitative Simulation Analysis of Metabolic Nets Validation:	Bart Jardine: Matlab Intro CircAdapt --diffusion model Model Validation:	Bassingthwaighte Cardiac Mechanics. Varying elastance modeling 5:30 PM: drive to Pier 55 ferry to Blake Island, Tillicum Village salmon dinner
Friday 8:30 AM 26 August	Bassingthwaighte Model stages for rMBF estimation from PET images ??: Effect of Noise in the data Parameter Evaluation	James Caldwell: rMBF: Regional Myocardial Blood Flow using PET Imaging and QPP Test of Model Validity Optimization for rMBF ====Hands on ===	Gary Raymond: Modular Modeling Example constructions with FORTRAN Standards for Modules Mono- versus multi- scale. Reproducible science	Wrap-up: Key strategies? Review Platt 1964. Integration Biology More sets of standards? Code Sharing 5:30 PM

~jbb/COURSE2011/Sched2011.15aug11

BassingthwaighteElectrophys, cell models: Boltzmann chan Boltz => HHActionPot
Beeler-Reuter Action Pot.

 Real **Multi-scale**: Rudy2010