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Development, Selection, and Validation of Tumor Growth Models AMIR SHAHMORADI[1], ERNESTO LIMA[2], J. TINSLEY ODEN[3], The University of Texas at Austin — In recent years, a multitude of different mathematical approaches have been taken to develop multiscale models of solid tumor growth. Prime successful examples include the lattice-based, agent-based (off-lattice), and phase-field approaches, or a hybrid of these models applied to multiple scales of tumor, from subcellular to tissue level. Of overriding importance is the predictive power of these models, particularly in the presence of uncertainties. This presentation describes our attempt at developing lattice-based, agent-based and phase-field models of tumor growth and assessing their predictive power through new adaptive algorithms for model selection and model validation embodied in the Occam Plausibility Algorithm (OPAL), that brings together model calibration, determination of sensitivities of outputs to parameter variances, and calculation of model plausibilities for model selection.

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