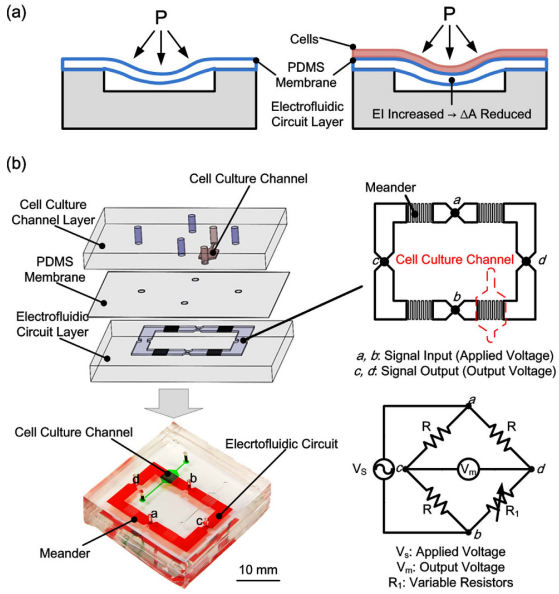
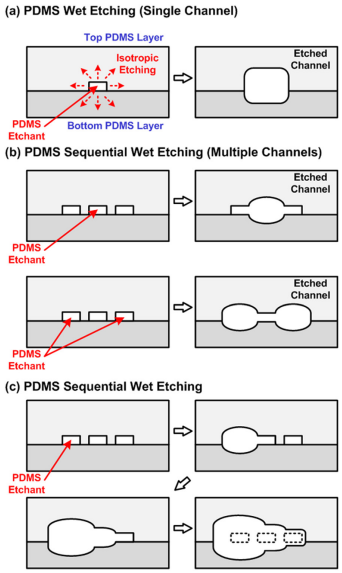
CASE STUDIES OF MULTIDISCIPLINARY SOLID MECHANICS IN ENGINEERING AND APPLIED SCIENCES





The main goal of our multidisciplinary research in applied sciences is to open doors to exciting possibilities of discovering new biological and engineering phenomena and mechanisms that classical physics cannot touch by means of solid mechanics. Based on computational mechanics, experiments can be guided through understanding particular principles at various environmental conditions. Furthermore, computation works inevitably need to be validated by several experimental tests. Therefore, research activities in our multidisciplinary study consist of theoretical, experimental, and computational mechanics studies. Following just such a scenario, this talk will report our current four research themes including: "Application of solid mechanics in biosensing & bioimaging techniques," "Nonlinear finite elements for continua," "Uncertainty-based mechanical analysis & design," and "Nano-mechanical investigation of engineering materials & live cells" and present several related case studies. Thus, in order to systematically interrogate the relevant integrative mathematical problems, we have developed novel theories of "Biomicromechanics," "Mechanics of fluid-structure interaction," and "Mechanics of engineering design" and applied advanced experimental techniques of "Microfluidics" and "Bio atomic force microscopy" with the benchmark studies of fundamental research in the fields of biology, physics, and engineering. Finally, in practical applications, we anticipate that the research achievements will fertilize us to understand more physiological states of biological specimens, mechanical characteristics of solid continua, and design strategies of stressed engineering systems under uncertain loads of various environments.

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Brief CV

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Experience:

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- Research Assistant, School of Engineering Brown University, 2009 – 2014
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