

NIMBioS Short Term Visitor Report
August 7-9, 2019

Project Title: Control Discovery Techniques Applied to Mathematical Models for Critical Care Medicine

A 2018 article in Current Opinion in Systems Biology by Day et. al., (COISB 12:22-29) provided an overview advances in the modelling and modulation of the inflammatory response to alleviate critical illness. The complex dynamics of this have been studied over several decades using various mathematical and computational modeling approaches. Less explored is the utilization of mathematical and engineering control methodologies both to understand the inherent control mechanisms of the system and to discover novel ways to externally perturb the system toward a desired control objective. During this short-term visit, Dr. Gary An and NIMBioS-affiliated faculty, Dr. Judy Day utilized the short-term visit to formulate a review manuscript that significantly expands on the initial COISB piece. The final product provides a thorough exposition on the current state of the art and identify future areas of opportunity and challenges of both the mathematical and medical aspects of control discovery applied to acute illness.

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