**2018 IMAG Futures Meeting – Moving Forward with the MSM Consortium (March 21-22, 2018)**

*Pre-Meeting Abstract Submission Form*

*\*Please submit to the NIBIB IMAG mailbox (*NIBIBimag@mail.nih.gov*) by* ***January 8th, 2018***

*\*Save your abstract as “MSM PI Last Name \_ 2018 IMAG Futures Pre-Meeting Abstract”*

**PI(s) of MSM U01: Michael Saunders (and subcontracting PI Bernhard Palsson)**

**Institution(s): Stanford University (and UC San Diego)**

**MSM U01 Grant Number:** U01GM102098

**Title of Grant:** Multiscale Molecular Systems Biology: Reconstruction and Model Optimization

**Abstract**

Which MSM challenges are you addressing from the IMAG 2009 Report and how?

<https://www.imagwiki.nibib.nih.gov/content/2009-imag-futures-report-challenges>

(indicate which challenge (#) you’re addressing)

General-purpose software tools for numerical optimization (#3,#5,#6).

Are you using machine learning and or causal inference methods and how?

 Not directly, but machine learning is a very special case of optimization.

Please briefly describe significant MSM achievements made (or expected).

 quadMINOS enables the solution of genome-scale models of Metabolism and macromolecular Expression (ME models). It is incorporated into the COBRA Toolbox 3.0.

 quadMINOS has led to cobraME, ecoliME, and solveME software developed by Laurence Yang and colleagues at UC San Diego under subcontracting PI Palsson.

Please suggest any new MSM challenges that should be addressed by the MSM Consortium moving forward.

*You may insert images by copying and pasting below*

 Click or tap here to enter text.

What expertise are on your team (e.g. engineering, math, statistics, computer science, clinical, industry) and who?

*Please list as “Expertise – Name, email”*

 *Numerical optimization – Michael Saunders,* *saunders@stanford.edu*

 *Numerical optimization – Ding Ma,* *dingma@stanford.edu*

 *Numerical optimization – Ron Estrin,* *restrin@stanford.edu*

 *Molecular biology modeling and numerical optimization – Laurence Yang, laurence.yang@gmail.com*

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