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TEMASEK LIFESCIENCES LABORATORY

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The Auditorium (Level 1)

Synthetic biology: an integration strategy to revolutionize the life sciences industry

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We are in urgent need of sustainable, innovative, and potent solutions to advance science, enhance human health, and reduce environmental pollution. The central paradigm of my research is using interdisciplinary approaches in biology, chemistry, engineering, physics, and computer science to study and manipulate complex biological systems. The main focus lies on developing and applying *in vivo* and *in vitro* synthetic biology technologies to engineer RNAs, proteins, pathways, and networks for addressing most daunting challenges in human health and environment. My past and ongoing research has involved universal vaccine development, virus engineering, design of effective immunostimulant, magnetic and ultrasonic cancer therapy, production of natural bioactive pigment, biohydrogen metabolic engineering, systems biology of biohythane production from lignocellulosic biomass, and symbiosis of *Vibrio* and yeast for utilization of chitin wastes.

Yuan Lu received his B.S. (2004) and PhD (2009) in Chemical Engineering from Tsinghua University, China. He was a postdoc in the Department of Biology at Johns Hopkins University, USA, from 2009 to 2010. In the following four years (2010-2014), he was a postdoc in the Department of Chemical Engineering at Stanford University, USA. Currently he is a project researcher at the University of Tokyo, Japan.

Recent Publications:

1. **Yuan Lu,** *et al*. Assessing sequence plasticity of a virus-like nanoparticle by evolution toward a versatile scaffold for vaccines and drug delivery. Proceedings of the National Academy of Sciences of the United States of America (PNAS), 2015, 112(40): 12360-12365
2. **Yuan Lu**, *et al*. Insights into the global regulation of anaerobic metabolism for improved biohydrogen production. Bioresource Technology, 2015, 200: 35-41
3. **Yuan Lu**, *et al*. Production and stabilization of the trimeric influenza hemagglutinin stem domain for potentially broadly protective influenza vaccines. Proceedings of the National Academy of Sciences of the United States of America (PNAS), 2014, 111(1): 125-130