

WPI-PRIME Synthetic Biology Workshop

7.15 TUE
14:15-18:00

Venue

Hankyu Corporation-Sanwa Bank Hall,
3F, Icho Kaikan, Suita Campus
The University of Osaka

Fee

Free

Access to Icho Kaikan

5-7mins walk
from
Handai-Byoin-mae Stn
(Osaka Monorail)
and
Handai Igakubu Byoin-
mae (Kintetsu Bus Stop)



WHERE BIOLOGY MEETS INNOVATION

This workshop brings together global scholars in synthetic and systems biology to explore innovations in cellular engineering, regenerative medicine, and bioluminescence.

REGISTER HERE

SCAN ME



Application Deadline
By 12:00 noon on July 14

(Drop-in participation is also welcome)

<https://forms.office.com/r/SQFb2Cerkq>

*Exchange event “WPI-PRIME Happy Hour” is scheduled after this workshop.

Organizer : Nozomu YACHIE (WPI-PRIME, The University of Osaka)

Contact

Research Planning and Management Office,
WPI-PRIME, The University of Osaka

✉ planning@prime.osaka-u.ac.jp

① Nika Shakiba

14:15



Probing and programming
multicellular systems for regenerative
medicine

② Toshimichi Yamada

14:50



Synthetic organizer cells guide
development via spatial and
biochemical instructions

③ Takeharu Nagai

15:25



Expanding the frontier of
autonomous bioluminescence:
From single cells to glowing plants



-Coffee Break 16:00-

④ Carl de Boer

16:15



Towards breaking the cis-regulatory
code

⑤ Matt Rich

16:50



Toward whole-animal synthetic
biology in *C. elegans*

⑥ Kenji Kamimoto

17:25



Decode, predict, and control biological
systems through single-cell omics and
integrative modelling approaches

Program Overview: Speakers and Topics

01

Nika Shakiba



The University of British Columbia, Canada
PRIME, The University of Osaka, Japan

Probing and programming multicellular systems for regenerative medicine

This talk will explore our ongoing work towards unraveling the rules that shape inequality in PSC populations, leveraging systems and synthetic biology tools. In doing so, we seek to open doors to engineering new tools to track and control the competition potential of cell therapies for regenerative medicine applications.

02

Toshimichi Yamada



University of California,
San Francisco (UCSF), USA

Synthetic organizer cells guide development via spatial and biochemical instructions

We engineered “synthetic” organizer cells that self-assemble around ESC aggregates with defined spatial structure and generate user-controlled WNT signaling gradients. By controlling the range and steepness of the gradients, we systematically directed tissue morphogenesis.

03

Takeharu Nagai



SANKEN, The University of Osaka, Japan

Expanding the frontier of autonomous bioluminescence: From single cells to glowing plants

Autonomous bioluminescence systems, which encode both luciferase and luciferin biosynthesis genes, enable continuous, substrate-free imaging in living cells and organisms. Recent advances include multicolor variants for cellular applications and the development of glowing plants as sustainable, electricity-free light sources with potential environmental benefits.

04

Carl de Boer



The University of British Columbia, Canada

Towards breaking the cis-regulatory code

The talk will discuss previous, current, and future work regarding efforts to combine synthetic genomics and machine learning to crack the cis-regulatory code, the code by which DNA sequences control gene expression.

05

Matt Rich



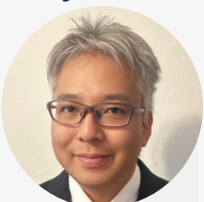
The University of Utah, USA

Toward whole-animal synthetic biology in *C. elegans*

The talk will present perspective and potential avenues for developing the tools required for massively-parallel synthetic biology in *C. elegans*.

06

Kenji Kamimoto



Research Institute for Microbial Diseases(BIKEN),
PRIME, The University of Osaka, Japan

Decode, predict, and control biological systems through single-cell omics and integrative modelling approaches

We aim to decipher the principles of complex biological regulation and translate them into predictive simulation models. In this talk, we will present our recent advances in integrating single-cell omics with continuous optical measurements to uncover the spatiotemporal dynamics of cellular behavior.