JGI JOINT GENOME INSTITUTE
UNITED STATES DEPARTMENT OF ENERGY

Overview of the JGI Synthetic Biology – DNA Synthesis Program

Yasuo Yoshikuni
3/22/2016

Agenda

- **Program Overview**
  - Vision, mission and strategy
  - DNA Synthesis Science Program CSP
    - Program Performance
- **Program's Focus Area**
  - Focus Area
    - Plant and Microbial Systems Modulated by Secondary Metabolites
- **Outreach**
  - Meetings to Outreach User Communities

PROGRAM OVERVIEW

DNA Synthesis Program

JGI's VISION:

Next-Gen. Genome Science User Facility

Specific emphasis on the development of capabilities for the high through-put addition of functional information to sequence data

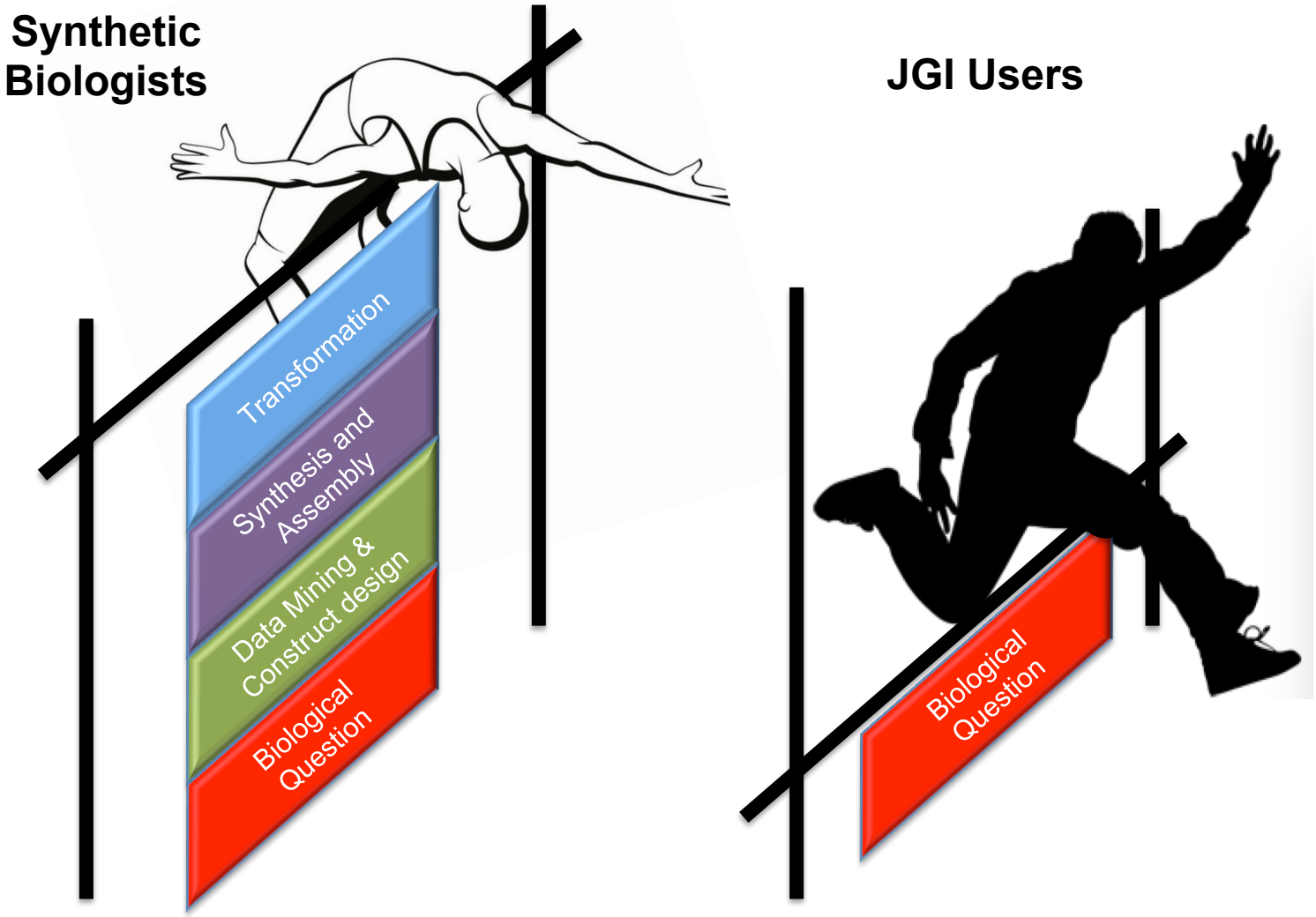
DNA Synthesis Science Program

Mission: Enable to perform state-of-the-art science

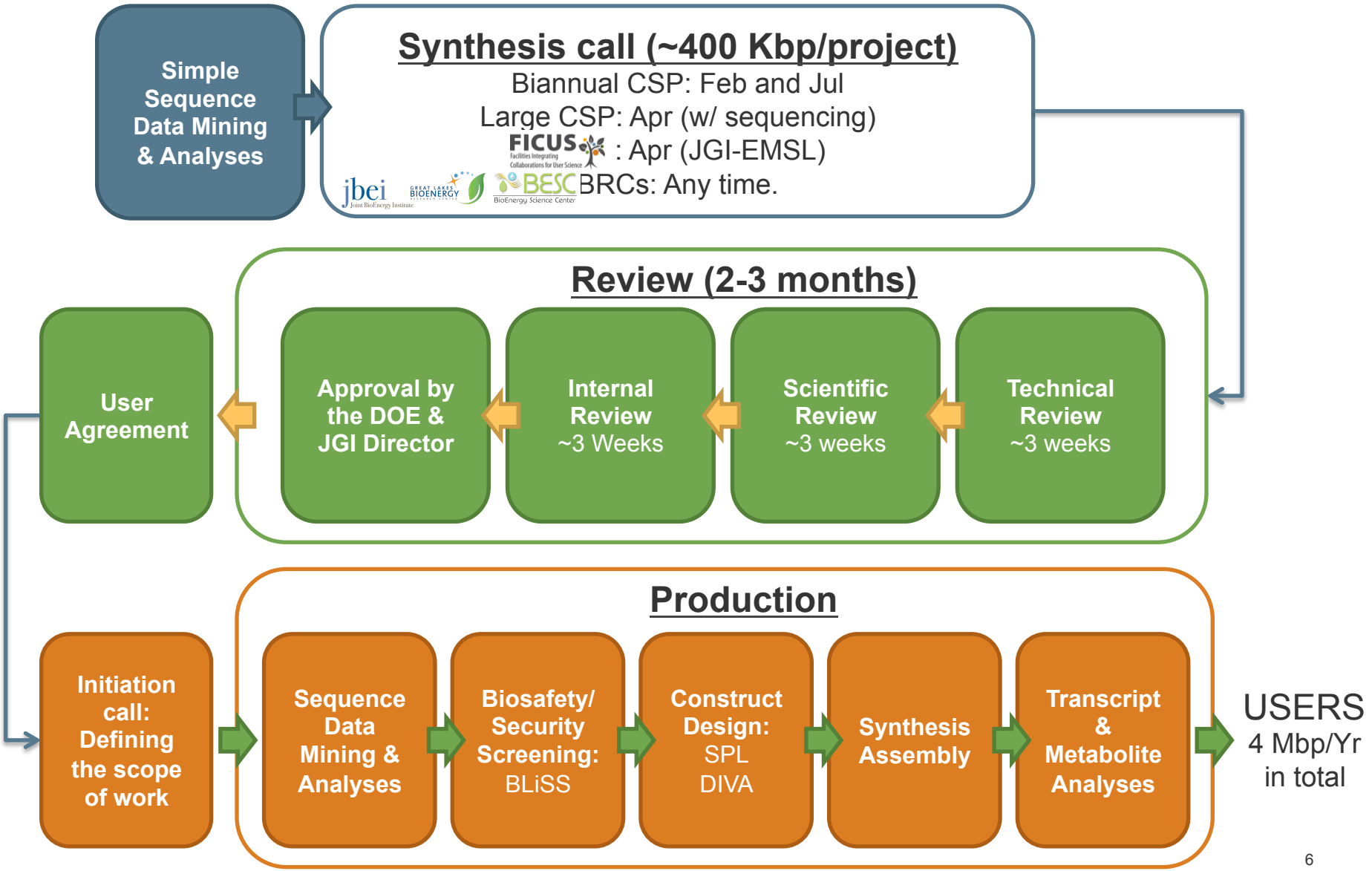
Strategy: Integrated Pipeline

- Sequence data mining (Gene and Pathway ID)
- Synthesis production platform
  - Sophisticated design platform
- Analyses – Transcripts and Metabolites

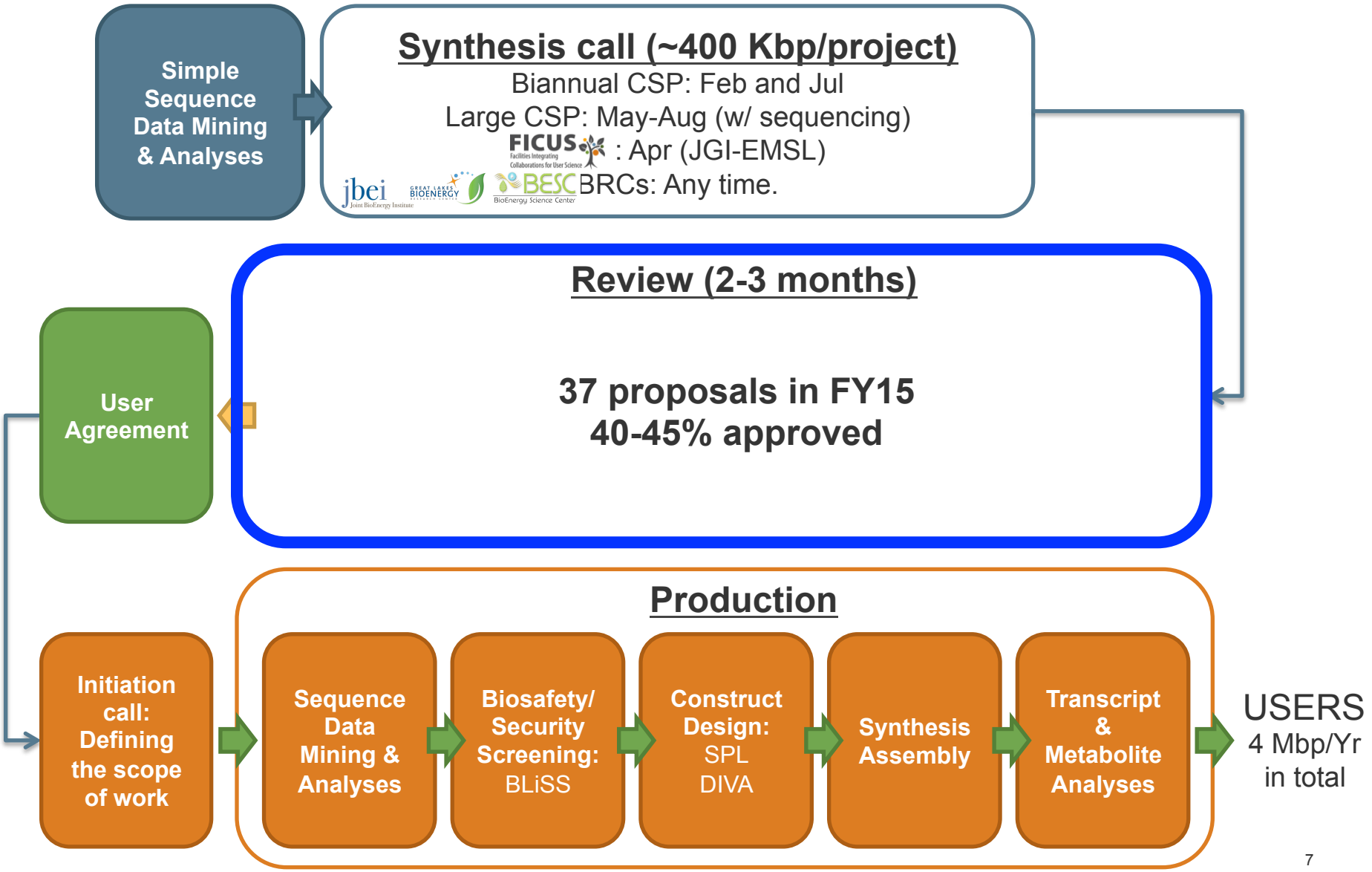
Our Mission is to Lower the Bar for Complex Pathway Engineering Projects



DNA Synthesis Science CSP Project



DNA Synthesis Science CSP Project



DNA Synthesis Science CSP Project

Simple Sequence Data Mining & Analyses

Synthesis call (~400 Kbp/project)

Biannual CSP: Feb and Jul

Large CSP: Aug (w/ sequencing)

FICUS : Apr (JGI-EMSL)

jbei GREAT LAKES BIOENERGY BESC BRCs: Any time.

Review (2-3 months)

Internal Review ~3 Weeks

Biosafety, Biosecurity, Biocontainment, and Environment Risks

Nathan Hilson

User Agreement

Initiation call: Defining the scope of work

Production

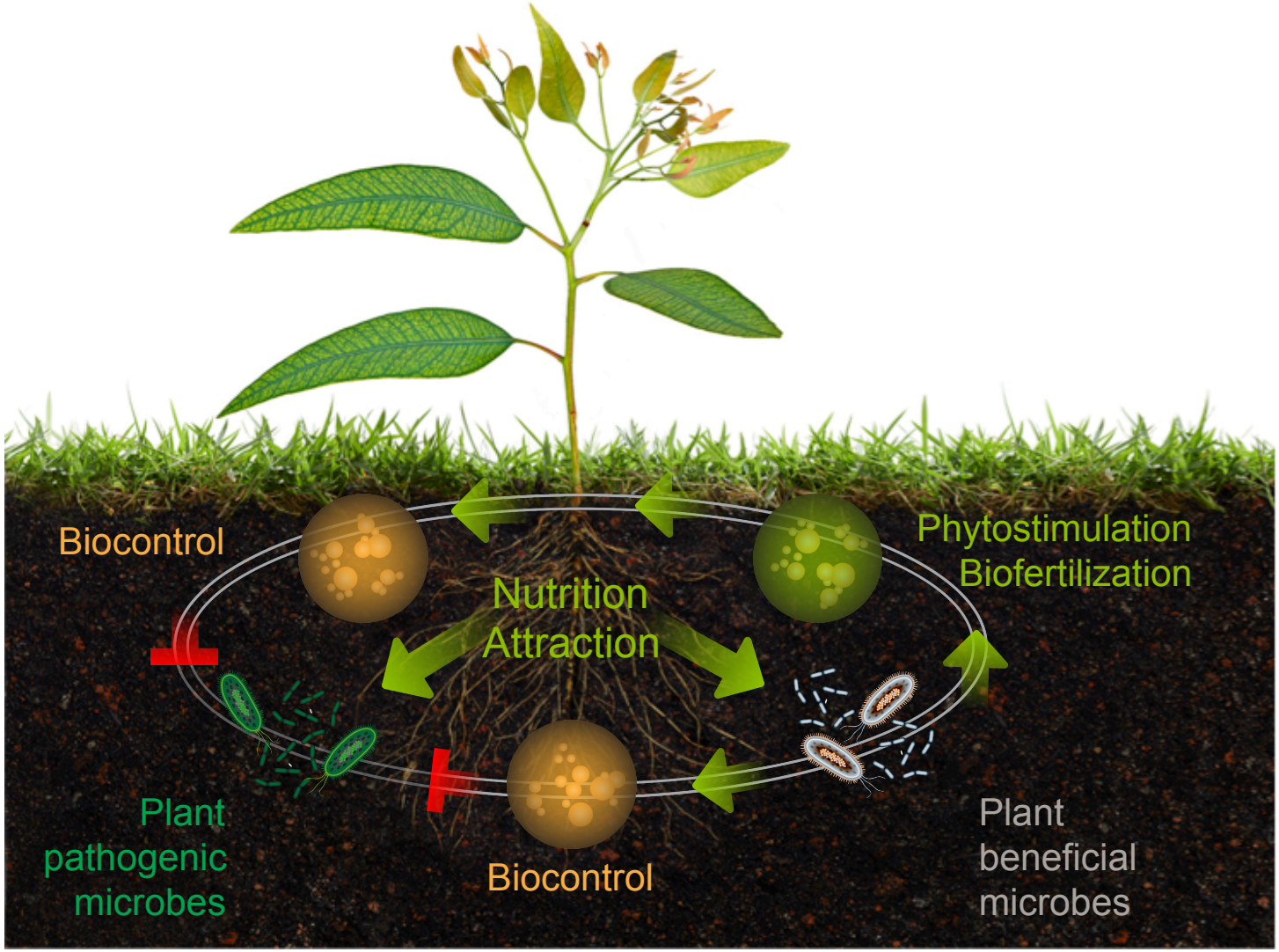
Biosafety/ Security Screening: BLiSS

Screen against
Select agent & toxin (CDC)
Export control lists (US commerce)

USERS
4 Mbp/Yr
in total

FOCUS AREA

Focus Area: Plant and Microbial Systems Modulated by Secondary Metabolites



Facilitate Users to Study Microbial and Plant Systems Modulated by Secondary Metabolites

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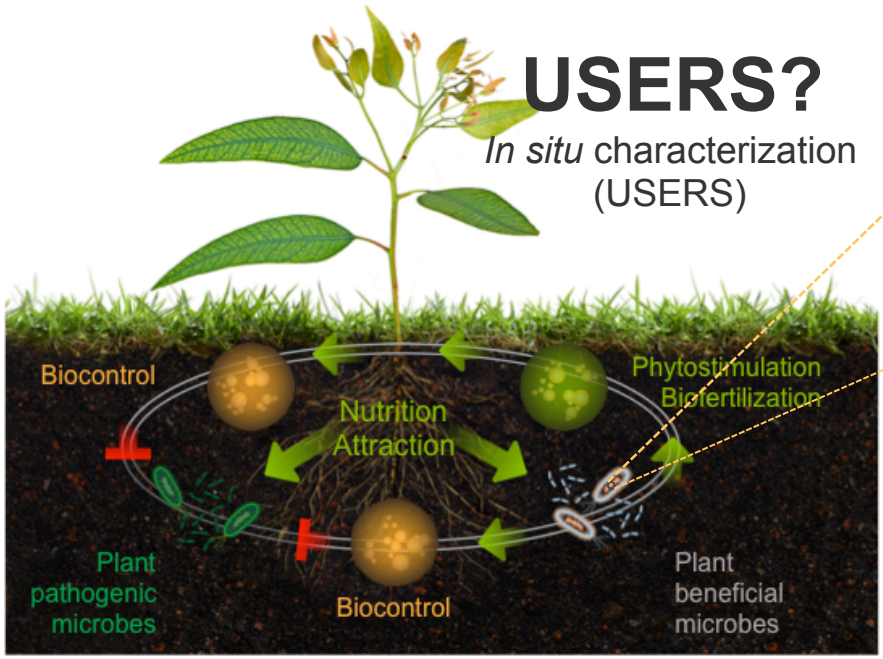
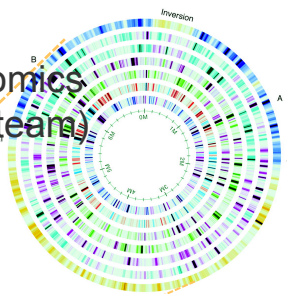
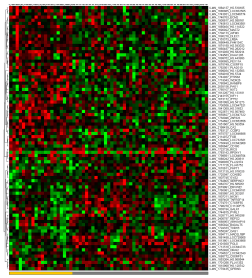
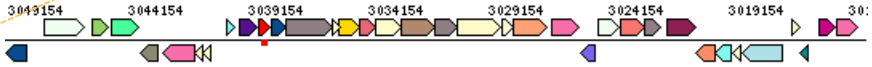


Genomics
Transcriptomics
(Microbial team)

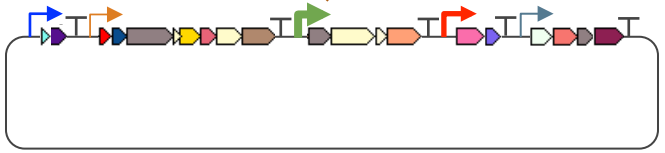


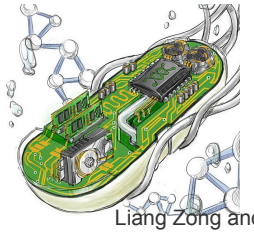


Bioinformatics
BC identification
(Microbial team)



Refactor, Codon opt.
DNA Synthesis
(Syn Bio team)





Strain
Engineering
(Syn Bio team)

Bioconversion
(Syn Bio team)

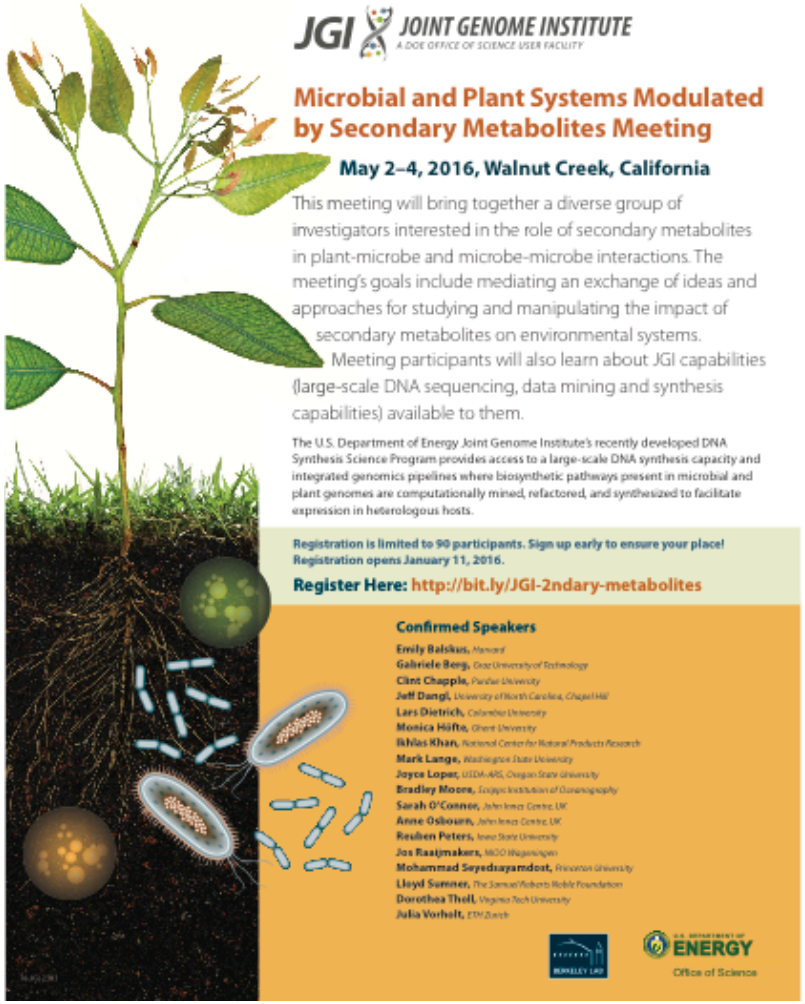
Purification & Characterization
(Metabolomics team)

Liang Zong and Yan Liang

OUTREACH

Microbial and Plant Systems Modulated by Secondary Metabolites Meeting 2016

- **Scheduled on May 2-4, 2016**
- **Objectives**
  - To be more knowledgeable
  - Recruit new users
  - Provide users opportunities to identify high impact projects
  - Identify users' needs
- **Attendees**
  - ~20 external speakers
  - ~80 attendees



Acknowledgement

Eddy Rubin
Director

Axel Visel
Science Program

Len Pennacchio
Genomic Technologies

PMO

Jan-Fang Chen
Functional Genomics Lead

Miranda Harmon-Smith
Program manager

Yasuo Yoshikuni
Program Head

Nathan Hillson
Syn. Bio. Informatics Lead

Sam Deutsch
DNA Syn. Assembly Lead

DNA synthesis production

Angie Tarver

Matt Hamilton

Dave Robinson

Robert Evans

Syn. Bio. Application

Sangeeta Nath

Cindi Hoover

Syn. Bio. Informatics

John Meng

Ernst Oberortner

Lisa Simirenko

Thanks for Your Attention!

Yasuo Yoshikuni

yyoshikuni@lbl.gov