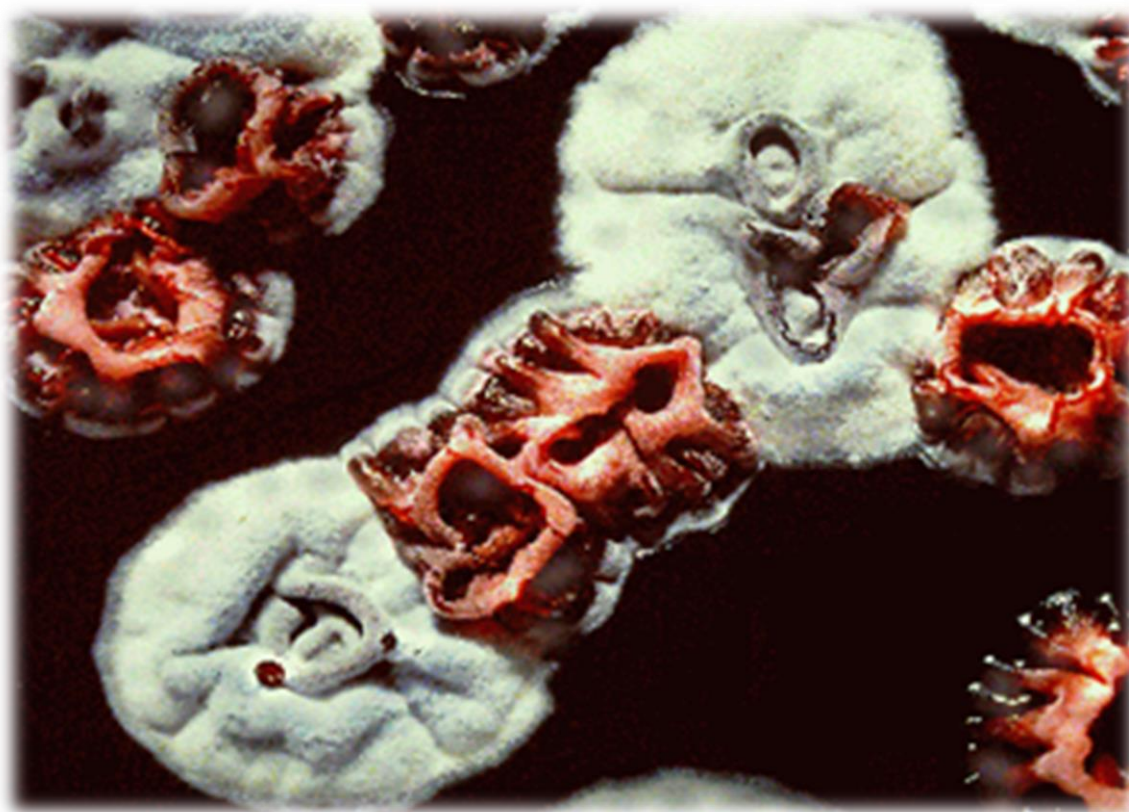


The 4<sup>th</sup> A3 Foresight Symposium on  
**Chemical & Synthetic Biology of  
Natural Products**

Dates: July 5-8, 2019

Shanghai Jiao Tong University, Shanghai, China



# Aim of this program

To construct an Asian academic research hub for the chemical & synthetic biology of natural products through 3-way international collaboration on the ‘chemical & synthetic biology of natural products through *Streptomyces* genome mining (Japan), artificial chromosome engineering (Korea), and synthetic cell factory design (China)’.



<http://a3-chemical-biology.jp/en/>

## Symposium

**The 1<sup>st</sup> A3 Foresight Symposium on “Chemical & Synthetic Biology of Natural Products” at Shanghai Jiao Tong University, Shanghai, China. (August 22-23, 2016)**



**The 2<sup>nd</sup> A3 Foresight Symposium on “Chemical and Synthetic Biology of Natural Products” at Grabel Hotel and Jeju ICC, Korea. (May 22-24, 2017)**





**The 3<sup>rd</sup> A3 Foresight Symposium on “Chemical and Synthetic Biology of Natural Products” at Hotel North City, Sapporo, Japan. (July 9-12, 2018)**





## Schedule

**July 5<sup>th</sup> Fri.      Registration**

Location: Leadingmen Collection Hotel

**July 6<sup>th</sup> Sat.**

(07:45 Bus Leadingmen Collection Hotel)

Location: Shuhua Auditorium, Shanghai Jiao Tong University

**08:30-08:45      Opening Remarks**

Zixin Deng (Shanghai Jiao Tong University, China)

Eung-Soo Kim (Inha University, Korea)

Yasuo Ohnishi (The University of Tokyo, Japan)

**08:45-09:00      Group Photo**

**09:00-10:00      Session 1:** Presentation by invited speakers (1)

**10:00-10:20      Coffee Break**

**10:20-11:20      Session 2:** Presentation by invited speakers (2)

**11:25              Lunch** (Bus to Canteen 2, SJTU)

**13:00-15:01      Session 3:** Group Presentation from Japan (1)

**15:01-15:20      Coffee Break**

**15:20-16:50      Session 4:** Group Presentation from Japan (2)

**16:50-17:20      Session 5:** Group Presentation from China (1)

**17:25              Dinner** (Bus to Huhua International Hotel)

**July 7<sup>th</sup> Sun.** (08:00 Bus Leadingmen Collection Hotel)

Location: Shuhua Auditorium, Shanghai Jiao Tong University

08:30-10:15 **Session 6:** Group Presentation from Korea (1)

10:15-10:30 Coffee Break

10:30-10:55 **Session 7:** Group Presentation from Korea (2)

10:55-11:30 **Session 8:** Group Presentation from China (2)

11:30 **Lunch** (Bus to Canteen 2, SJTU)

13:00-15:00 **Session 9:** Group Presentation from China (3)

15:00-15:20 Coffee Break

15:20-17:38 **Session 10:** Group Presentation from China (4)

17:38-18:10 **Panel Discussion, Award and Closing Ceremony**

18:15 **Dinner** (Bus to Academic Exchange Center Hotel, SJTU)

**July 8<sup>th</sup> Mon. Departure**

07:45 Two Bus (Leadingmen Collection Hotel)

08:00 Bus 1 Hongqiao International Airport, Terminal 1, Terminl 2 (40 min)

Bus 2 Pudong International Airport, Terminal 1, Terminl 2 (60 min)

# Program

## July 6<sup>th</sup> Sat.

### Opening Remarks (Chair: Prof. Linqun Bai)

08:30-08:45

Zixin Deng (Shanghai Jiao Tong University, China)

Eung-Soo Kim (Inha University, Korea)

Yasuo Ohnishi (The University of Tokyo, Japan)

08:45-09:00 **Group Photo**

### Session 1: Presentation by Invited Speakers (1) (Chair: Prof. Shuangjun Lin)

09:00-09:30

#### ***Streptomyces* metabolites in microbial interaction**

Prof. Kenji Ueda

Life Science Research Center, College of Bioresource Sciences, Nihon University

09:30-10:00

#### **Characterization and application of agar hydrolyzing system of *Streptomyces coelicolor* A3 (2)**

Prof. Soon-Kwang Hong

Myongji University

**10:00-10:20 Coffee Break**

### Session 2: Presentation by Invited Speakers (2) (Chair: Prof. Shuangjun Lin)

10:20-10:50



### **Structural insights into pericyclase catalysis**

Prof. Jiahai Zhou

Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences

10:50-11:20

### **Compartmentalized biosynthesis of mycophenolic acid**

Prof. Shengying Li

Shandong University

### **11:25 Lunch (Bus to Canteen 2, SJTU)**

### **Session 3: Group Presentation from Japan (1) (Chair: Prof. Yasuo Ohnishi)**

13:00-13:05

#### **Introduction**

Yasuo Ohnishi<sup>1,2</sup>, Yohei Katsuyama<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

13:05-13:25

### **Studies on the unique life cycle of the rare actinomycete *Actinoplanes missouriensis***

Takeaki Tezuka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

13:25-13:35

### **Genome analysis of the industrial fungus *Aspergillus sojae***

Atsushi Sato<sup>1,2</sup>, Yasuji Koyama<sup>2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Noda Institute for Science Research

13:35-13:45

**Genome mining for novel nitrating cytochrome P450s provides insights into lajollamycin biosynthesis**

Hiroya Tomita<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

13:45-13:55

**X-ray structural analysis of the KS-CLF heterodimer and the ACP-KS-CLF ternary complex of a highly reducing type II PKS**

Danyao Du<sup>1,†</sup>, Yohei Katsuyama<sup>1,2</sup>, Shinya Fushinobu<sup>1,2</sup>, Aochiu Chen<sup>3</sup>, Tony D. Davis<sup>3</sup>, Michael D. Burkart<sup>3</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

<sup>3</sup>Department of Chemistry and Biochemistry, University of California, San Diego, USA

<sup>†</sup>Novozymes Japan Ltd.

13:55-14:00

**Biochemical and structural analysis of geranyl pyrophosphate C6-methyltransferase BezA**

Hayama Tsutsumi<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:00-14:05

**Altering the regioselectivity of the toluic acid-recognizing biosensor XylS through directed evolution**

Yuki Ogawa<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Kento Ueno<sup>1</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:05-14:08

**Biosynthesis of the aromatic polyketide yoropyrazone in *Streptomyces* sp. IFM11307**

Kasumi Fujita<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Kazufumi Toume<sup>3</sup>, Masami Ishibashi<sup>4</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

<sup>3</sup>Institute of Natural Medicine, University of Toyama

<sup>4</sup>Graduate School of Pharmaceutical Sciences, Chiba University

14:08-14:11

**Identification of *Kutzneria albida* secondary metabolites synthesized using the secondary metabolism-specific nitrous acid biosynthetic pathway**

Akito Yamada<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:11-14:14

**Analysis of cross-talk of ACPs among type II FAS and PKSs**

Masanobu Horiuchi<sup>1</sup>, Danyao Du<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:14-14:17

**Production of methylgeranylated polyphenols using BezA and NphB**

Naoki Urano<sup>1</sup>, Hayama Tsutsumi<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:17-14:20

**Biosynthesis of the nonribosomal peptide, cirratiomycin from *Streptomyces cirattus***

Jiafeng Li<sup>1</sup>, Yohei Katsuyama<sup>1,2</sup>, Kazuo Shin-ya<sup>3</sup>, Yasuo Ohnishi<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

<sup>3</sup>National Institute of Advanced Industrial Science and Technology (AIST)

14:20-14:25

**Introduction**

Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:25-14:45

**Intergeneric cell-cell contact dependent conversion of bioactive natural products in combined-culture between *Streptomyces* sp. HEK616 and *Tsukamurella***

*pulmonis*

Shumpei Asamizu<sup>1,2</sup>, Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:45-14:50

**Interrogating the relationship between filamentous actinomycetes and mycolic acid-containing bacteria in ecosystem**

Manami Kato<sup>1</sup>, Shumpei Asamizu<sup>1,2</sup>, Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:50-14:53

**Toward understanding the mechanism of intergeneric cell-cell contact induced activation of secondary metabolism using *Streptomyces coelicolor* and *Tsukamurella pulmonis* as model system**

Masashi Kida<sup>1</sup>, Shumpei Asamizu<sup>1,2</sup>, Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

14:53-14:58

**Enzymatic condensation of RiPP and very long chain fatty acid to synthesize unprecedented lipopeptide**

Ryosuke Kozakai<sup>1</sup>, Shumpei Asamizu<sup>1,2</sup>, Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo



14:58-15:01

**Toward understanding the mechanism of goadsporin induced activation of secondary metabolism**

Sachiko Kawano<sup>1</sup>, Shumpei Asamizu<sup>1,2</sup>, Hiroyasu Onaka<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

**15:01-15:20 Coffee Break**

**Session 4: Group Presentation from Japan (2)** (Chair: Prof. Yasuo Ohnishi)

15:20-15:25

**Introduction**

Tomohisa Kuzuyama<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

15:25-15:35

**Biogasoline production by engineered polyketide synthases**

Satoshi Yuzawa<sup>1</sup> and Tomohisa Kuzuyama<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

15:35-15:38

**Biosynthetic studies on unusual methylbenzene-containing polyenes**

Jie Zhang<sup>1</sup> and Tomohisa Kuzuyama<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

15:38-15:41

**Biosynthetic studies on *Streptomyces meroterpenoid***

Tomohiro Noguchi<sup>1</sup> and Tomohisa Kuzuyama<sup>1,2</sup>

<sup>1</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>2</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

15:41-15:46

**Introduction:**

**Biosynthetic studies of macrocyclic polyketide antibiotics in actinomycetes**

Fumitaka Kudo

Tokyo Institute of Technology

15:46-15:51

**Biosynthetic studies on 3-aminononanoic acid starter unit of cremimycin**

Daisuke Kawasaki, Taichi Chisuga, Akimasa Miyanaga, Fumitaka Kudo, Tadashi Eguchi

Tokyo Institute of Technology

15:51-15:56

**Engineering of macrocyclic polyketides biosynthesis in *Streptomyces graminofaciens***

Kosuke Kishikawa, Akimasa Miyanaga, Fumitaka Kudo, Tadashi Eguchi

Tokyo Institute of Technology

15:56-16:01

## **Engineering of hitachimycin biosynthesis**

Sotaro Takahashi, Yuichiro Nakazawa, Koichi Kawamura, Akimasa Miyanaga,

Fumitaka Kudo, Tadashi Eguchi

Tokyo Institute of Technology

16:01-16:06

### **Introduction:**

#### **Polycationic peptides - discovery, biosynthesis, and application**

Yoshimitsu Hamano

Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

16:06-16:11

#### **Biosynthesis of peptide natural products**

Chitose Maruyama

Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

16:11-16:14

#### **Identification and characterization of bacterial 1-aminocyclopropane-1-carboxylic acid synthase**

Yukiko Chinone<sup>1</sup>, Yoshimitsu Hamano<sup>1</sup>, Junko Hashimoto<sup>2</sup>, Ikuko Kozono<sup>2</sup>, Kazuo Shin-ya<sup>3</sup>, Chitose Maruyama<sup>1</sup>

<sup>1</sup>Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

<sup>2</sup>Japan Biological Informatics Consortium (JBIC)

<sup>3</sup>National Institute of Advanced Industrial Science and Technology (AIST)

16:14-16:17

#### **Biosynthesis of a streptothricin analogue possessing *O*-acylpeptide side chain**

Seren Nagashima<sup>1</sup>, Chitose Maruyama<sup>1</sup>, Yukiko Chinone<sup>1</sup>, Yasushi Ogasawara<sup>2</sup>, Junko Hashimoto<sup>3</sup>, Kazuo Shin-ya<sup>4</sup>, Tohru Dairi<sup>2</sup>, Yoshimitsu Hamano<sup>1</sup>

<sup>1</sup>Department of Bioscience, Fukui Prefectural University

<sup>2</sup>Department of Engineering, Hokkaido University

<sup>3</sup>Japan Biological Informatics Consortium (JBIC)

<sup>4</sup>National Institute of Advanced Industrial Science and Technology (AIST)

16:17-16:20

**Intracellular delivery of macromolecules modified with  $\epsilon$ -poly-L-lysine**

Yamato Takeuchi<sup>1</sup>, Chitose Maruyama<sup>1</sup>, Yasuo Kato<sup>2</sup>, Yoshimitsu Hamano<sup>1</sup>

<sup>1</sup>Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

<sup>2</sup>Graduate School of Engineering, Toyama Prefectural University

16:20-16:23

**Chemical modification of the bioactive small molecules with  $\epsilon$ -poly-L-lysine for improving cell membrane permeability and water solubility**

Fumika Matsumura<sup>1</sup>, Chitose Maruyama<sup>1</sup>, Yamato Takeuchi<sup>1</sup>, Yasuo Kato<sup>2</sup>, Yoshimitsu Hamano<sup>1</sup>

<sup>1</sup>Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

<sup>2</sup>Graduate School of Engineering, Toyama Prefectural University

16:23-16:26

**Chemical modification of the bioactive small molecules with oligo(L-Lys) for improving cell membrane permeability and water solubility**

Kohei Kaneda<sup>1</sup>, Chitose Maruyama<sup>1</sup>, Yamato Takeuchi<sup>1</sup>, Yasuo Kato<sup>2</sup>, Yoshimitsu Hamano<sup>1</sup>

<sup>1</sup>Graduate School of Bioscience and Biotechnology, Fukui Prefectural University

<sup>2</sup>Graduate School of Engineering, Toyama Prefectural University

16:26-16:31

**Introduction:**

**Overview of biosynthetic machinery, structural redesign, regulatory network, and genome mining in actinomycetes**

Kenji Arakawa

<sup>1</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

<sup>2</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University

16:31-16:34

**Metabolite analysis of biosynthetic gene mutants of the signaling molecule SRB in *Streptomyces rochei***

Aiko Teshima<sup>1</sup>, and Kenji Arakawa<sup>1,2</sup>

<sup>1</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

<sup>2</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University

16:34-16:37

**A practical genome mining using butenolide-type signaling molecules in *Streptomyces* species**

Yuto Eguchi<sup>1</sup>, Miho Sumiyoshi<sup>2</sup>, Aiko Teshima<sup>2</sup>, and Kenji Arakawa<sup>1,2</sup>

<sup>1</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University

<sup>2</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

16:37-16:40

**Analysis of metabolic production through rational modification of signaling-molecule regulatory genes coded on the *Streptomyces rochei* chromosome**

Yuya Misaki<sup>1</sup>, Miyuki Iwakuni<sup>2</sup>, Toshihiro Suzuki<sup>2</sup>, and Kenji Arakawa<sup>1,2</sup>

<sup>1</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University



<sup>2</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

16:40-16:43

**Comprehensive metabolome analysis to explore the biologically active metabolites based on genome sequences**

Rikito Nishiura<sup>1</sup>, Amirudin Akhmad Fauzi<sup>1</sup>, Yosi Nindita<sup>1</sup>, Junko Hashimoto<sup>2</sup>, Kazuo Shin-ya<sup>3</sup>, Haruo Ikeda<sup>4</sup>, and Kenji Arakawa<sup>1,5</sup>

<sup>1</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

<sup>2</sup>Japan Biological Informatics Consortium (JBIC)

<sup>3</sup>National Institute of Advanced Industrial Science and Technology (AIST)

<sup>4</sup>Kitasato Institute for Life Sciences, Kitasato University

<sup>5</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University

16:43-16:47

**Biosynthetic investigation of unique carbocyclic polyketides**

Hazuki Ogata<sup>1</sup>, Yuji Yukiyo<sup>1</sup>, Yuki Inahashi<sup>2,3</sup>, Yoko Takahashi<sup>2</sup>, Satoshi Ōmura<sup>2</sup>, Tomohisa Kuzuyama<sup>4,5</sup>, Chin Piow Wong<sup>6</sup>, Hiroyuki Morita<sup>6</sup>, Takuji Nakashima<sup>2,3</sup>, and Kenji Arakawa<sup>1,7</sup>

<sup>1</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

<sup>2</sup>Kitasato Institute for Life Sciences, Kitasato University

<sup>3</sup>Graduate School of Infection Control Sciences, Kitasato University

<sup>4</sup>Graduate School of Agricultural and Life Sciences, The University of Tokyo

<sup>5</sup>Collaborative Research Institute for Innovative Microbiology, The University of Tokyo

<sup>6</sup>Institute of Natural Medicine, University of Toyama

<sup>7</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima

University

16:47-16:50

**Analysis of the biosynthetic machinery of azoxyalkene compounds**

Kota Fujita<sup>1</sup>, Ayaka Tatsukawa<sup>2</sup>, Takuya Kishimoto<sup>2</sup>, Atsushi Fukumoto<sup>3</sup>, Yojiro Anzai<sup>3</sup>, and Kenji Arakawa<sup>1,2</sup>

<sup>1</sup>Unit of Biotechnology, Graduate School of Integrated Sciences for Life, Hiroshima University

<sup>2</sup>Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

<sup>3</sup>Faculty of Pharmaceutical Science, Toho University

**Session 5: Group Presentation from China (1)** (Chair: Prof. Linquan Bai)

16:50 -16:55

**Introduction**

Shuangjun Lin, Tingting Huang

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:55-17:00

**Production of hydroxypyruvate in *Escherichia coli***

Xiaolai Lei, Qi Liu, Jingjie Jiang, Tingting Huang, Shuangjun Lin

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:00-17:05

**Biosynthesis of coprisidin**

Feiyan Lin, Yingyi Duan, Tingting Huang, Manchen Tang, Shuangjun Lin

State Key Laboratory of Microbial Metabolism, School of Life Sciences and

Biotechnology, Shanghai Jiao Tong University

17:05-17:10

**Biosynthesis of  $\beta$ -carboline alkaloid intermediate in streptonigrin pathway**

Xiaozheng Wang, Wenli Guo, Dekun Kong, Tingting Huang, Shuangjun Lin

State Key Laboratory of Microbial Metabolism, School of Life Sciences and  
Biotechnology, Shanghai Jiao Tong University

17:10-17:15

**Genome mining for the flavinprotein as coenzyme for StnD catalyzed quinone  
hydroxylation**

Xinyue Xie, Xiaozheng Wang, Tingting Huang, Shuangjun Lin

State Key Laboratory of Microbial Metabolism, School of Life Sciences and  
Biotechnology, Shanghai Jiao Tong University

17:15-17:20

**C-H hydroxylation of aromatics catalyzed by dioxygenase**

Chong Yin, Wangli Peng, Shuangjun Lin, Rubin Liang

State Key Laboratory of Microbial Metabolism, School of Life Sciences and  
Biotechnology, Shanghai Jiao Tong University

**17:25 Dinner (Bus to Huhua International Hotel)**

**July 7<sup>th</sup> Sun**

**Session 6: Group Presentation from Korea (1)** (Chair: Prof. Eung-Soo Kim)

08:30-08:35

**Introduction:**

**Overview of isolation and expression of large-sized natural product biosynthetic gene cluster**

Prof. Eung-Soo Kim

Inha University

08:35-08:47

**Development of novel NPP antifungal polyene macrolides in a rare *Actinomycetes***

Dr. Sisun Choi, Heung-Soon Park, Chi-Young Han, Hye-Jin Kim and Eung-Soo Kim\*

Inha University

08:47-08:59

**Cell factory design and culture process optimization for dehydroshikimate biosynthesis in *Escherichia coli***

Dr. Han-Na Lee, Eunhwi Park, Seung-Yeul Seo, Sisun Choi, Sang joun Lee, and Eung-Soo Kim\*

Inha University

08:59-09:11

**Thioesterase domain modification for production of cyclized tautomycetin**

Dr. Hee-Ju Nah, Seunghee Choi, Sisun Choi, Eung-Soo Kim\*

Inha University

09:11-09:16

**Isolation of novel polyene compounds *via* antifungal bioassay-based screening in**

***Actinomycetes* species**

Heung-soon Park, Si-Sun Choi, and Eung-Soo Kim\*

Inha University

09:16-09:21

**High production of tautomycetin enhancing expression of regulatory genes in heterologous host**

Seunghye Choi, Hee-Ju Nah, Sisun Choi, and Eung-Soo Kim\*

Inha University

09:21-09:26

**Construction of *Corynebacterium* cell factory for shikimic acid overproduction by metabolic pathway engineering**

Eunhwi Park, Han-Na Lee, Seung-Yeul Seo, Sang joun Lee, and Eung-Soo Kim\*

Inha University

09:26-09:31

**Introduction:**

**Biomolecule reconstruction by glycosylation platform**

Prof. Jae Kyung Sohng

Sun Moon University

09:31-09:43

**Mutagenetic studies for product specificity of YjiC towards  $\alpha$ -mangostin monoglucoside**

Dr. Tae-Su Kim, Hue Thi Nguyen, Kye Woon Cho, Jae Kyung Sohng\*

Sun Moon University

09:43-09:55

**Isolation and characterization of bioactive molecules from *Nocardia***



Dr. Dipesh Dhakal, Jae Kyung Sohng\*

Sun Moon University

09:55-10:00

**Biosynthesis and characterization of unusual furan type compound from marine *Streptomyces***

Hue Thi Nguyen, Chung Thanh Nguyen, Van Thuy Thi Pham, Jae-Kyung Sohng\*

Sun Moon University

10:00-10:05

**Discovery of a new natural product in *Streptomyces peucetius***

Van Thuy Thi Pham, Chung Thanh Nguyen, Hue Thi Nguyen, Jae-Kyung Sohng\*

Sun Moon University

10:05-10:10

**Activating cryptic biosynthetic pathway in *Streptomyces* sp. KTCT0041BP**

Chung Thanh Nguyen, Van Thuy Thi Pham, Hue Thi Nguyen, Jae-Kyung Sohng\*

Sun Moon University

10:10-10:15

**Domain mutagenesis of herboxidiene gene cluster to generate novel analogues**

Rubin Thapa Magar, Jae-Kyung Sohng\*

Sun Moon University

**10:15-10:30 Coffee Break**

**Session 7: Group Presentation from Korea (2)** (Chair: Prof. Eung-Soo Kim)

10:30-10:35

**Iron competition triggers antibiotic biosynthesis in *Streptomyces coelicolor* during**

**co-culture with *Myxococcus xanthus***

Namil Lee, Woori Kim, Jinkyoo Chung, Yongjae Lee, Suhyung Cho, Kyoung-Soon Jang, Sun Chang Kim, Bernhard Palsson, and Byung-Kwan Cho\*

Korea Advanced Institute of Science and Technology (KAIST)

10:35-10:40

**Primary transcriptome and translome analysis determines transcriptional and translational regulatory elements encoded in the *Streptomyces clavuligerus* genome**

Soonkyu Hwang, Namil Lee, Yujin Jeong, Yongjae Lee, Woori Kim, Suhyung Cho, Bernald O Palsson, Byung-Kwan Cho\*

Korea Advanced Institute of Science and Technology (KAIST)

10:40-10:45

**The transcription unit architecture of *Streptomyces lividans* TK24**

Yongjae Lee, Namil Lee, Yujin Jeong, Soonkyu Hwang, Woori Kim, Suhyung Cho, Bernhard O. Palsson, and Byung-Kwan Cho\*

Korea Advanced Institute of Science and Technology (KAIST)

10:45-10:50

**Biochemical identification of a neoagarooligosaccharides hydrolase in *Streptomyces coelicolor* A3 (2)**

Ju Won Seo, Soon-Kwang Hong\*

Myongji University

10:50-10:55

**Regulation of agararses production in *Streptomyces coelicolor* A3 (2)**

Maral Tsevelkhorloo, Soon-Kwang Hong\*

Myongji University

**Session 8: Group Presentation from China (2)** (Chair: Prof. Linqun Bai)

10:55-11:15

**Synthetic biology approaches for multi-copy chromosomal integration of natural product biosynthetic gene clusters in *Streptomyces***

Prof. Yinhua Lu

Shanghai Normal University

11:15-11:30

**A CRISPR/Cas12a-derived biosensing platform for the highly sensitive detection of diverse small molecules**

Associate Prof. Gaoyi Tan

East China University of Science and Technology

**11:30 Lunch (Bus to Canteen 2, SJTU)**

**Session 9: Group Presentation from China (3)** (Chair: Prof. Linqun Bai)

13:00-13:20

**Introduction:**

**Global regulation of crotonylation on metabolic development of *Streptomyces* through carbon catabolite repression**

Prof. Xu-Ming Mao, Prof. Yongquan Li

Zhejiang University

13:20-13:25

**Artificial construction of glycopeptide antibiotic A82846B biosynthetic pathway and mechanism study for high yield**

Hui Qian, Yongquan Li

Zhejiang University

13:25-13:30

**DNA methylation regulates the secondary metabolism of *Streptomyces roseosporus***

Jiao-Le Fang, Yongquan Li

Zhejiang University

13:30-13:50

**Bio-formation and bio-control of cyclopropane ring in CC-1065 and yatakemycin biosynthesis**

Prof. Gong-Li Tang

Shanghai Institute of Organic Chemistry, CAS

13:50-14:05

**Anthraquinone- $\gamma$ -pyrone ring formation in complex aromatic polyketide biosynthesis**

Associate Prof. Xian-Feng Hou

Shanghai Institute of Organic Chemistry, CAS

14:05-14:10

**A self-resistance strategy existing in naphthyridinomycin biosynthesis**

Wan-Hong Wen, Yue Zhang, and Gong-Li Tang\*

Shanghai Institute of Organic Chemistry, CAS

14:10-14:15

**Investigating divergent tailoring pathways of two series of aromatic polyketides generated through mining**

Qiu-Yue Nie, Zhen-Yu Ji, Xian-Feng Hou, and Gong-Li Tang\*

Shanghai Institute of Organic Chemistry, CAS

14:15-14:35

**Introduction:**

**Deciphering the late steps of rifamycin biosynthesis**

Prof. Wei Zhang, Prof. Shengying Li

Shandong University, China

14:35-14:40

**Complete elucidation of the late steps of bafilomycin biosynthesis in *Streptomyces lohii***

Zhong Li, Lei Du, Wei Zhang, XingWang Zhang, David H. Sherman and Shengying Li\*

Qingdao Institute of Bioenergy and Bioprocess Technology, CAS

14:40-14:45

**Introduction**

Prof. Yuemao Sheng

Shandong University

14:45-14:50

**A single-component flavoenzyme catalyzed regioselective halogenation of pyrone in the biosynthesis of venemycins**

Rentai Song, Haixia Shi, Jing Zhu, Haoxin Wang\*, Yuemao Shen\*

Shandong University

14:50-14:55

**Construction of a hybrid gene cluster to reveal coupled ring formation–hydroxylation in the biosynthesis of HSAF and analogues from *Lysobacter enzymogenes***

Xue Li, Haoxin Wang, Yaoyao Li\* and Liangcheng Du\*

Shandong University

14:55-15:00



### **Base editing in *Streptomyces* with Cas9-deaminase fusions**

Zhiyu Zhong, Junhong Guo, Liang Deng, Li Chen, Jian Wang, Sicong Li, Wei Xu, Zixin Deng, Yuhui Sun\*

Wuhan University

### **15:00-15:20 Coffee Break**

### **Session 10: Group Presentation from China (4) (Chair: Prof. Linqun Bai)**

15:20-15:25

#### **Introduction**

Yan Feng

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:25 -15:30

#### **Engineering promiscuous thioesterase TesA from *E. coli* for medium-chain fatty acids biosynthesis**

Xi Deng, Liuqing Chen, Guangyu Yang\*, Yan Feng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:30 -15:35

#### **Algorithm-based coevolution network identification reveals key functional sectors of the $\alpha/\beta$ hydrolase subfamilies**

Zhiyun Wu, Lishi Xu, Hao Liu, Haifeng Chen\*, Yan Feng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:35 -15:40

## **Introduction**

Delin You

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:40-15:45

### **Tailoring enzymes involved in anisomycin biosynthesis**

Qing Wang and Delin You\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:45-15:50

### **Construction of the engineering strain for production of drug precursors demeclocycline and demecycline**

Weinan Yang and Delin You\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

15:50-16:05

## **Introduction:**

### **Theoretical studies on the mechanisms of thioesterase-catalyzed polyketide chain release**

Associate Prof. Ting Shi, Prof. Yilei Zhao

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:05-16:10

### **The Molecular recognition basis for phosphorothioated DNA diverge from normal DNA**

Jiayi Li, Ting Shi and Yilei Zhao\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:10-16:15

**Computational studies for mechanism of enantioselectivity in a zinc-dependent dehydrogenase**

Shenggan Luo, Ting Shi and Yilei Zhao\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:15-16:20

**An explanation for tautomycin thioesterase preferring hydrolysis to macrocyclization**

Lei Liu, Ting Shi and Yilei Zhao\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:20-16:25

**Insights into substrate specificity and catalytic mechanism of nystatin/amphotericin B thioesterase**

Rufang Wang, Ting Shi and Yilei Zhao\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:25-16:45

**Introduction:**

**Structural and functional dissection of modular polyketide synthases**

Prof. Jianting Zheng

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:45-16:50

**Crystal structure of acetyl-CoA carboxylase  $\beta$ -subunit of *Streptomyces antibioticus***

Imtiaz Ali and Jianting Zheng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:50-16:55

**Crystal structure of FAD dependent halogenase ChlB4 and acyl-transferase ChlB3 in the biosynthesis of chlorothricin**

Asad Ullah Saeed and Jianting Zheng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

16:55-17:00

**Theoretical studies on the catalytic mechanism and substrate specificity of acyltransferase domains from salinomycin polyketide synthase**

Huining Ji and Jianting Zheng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:00-17:05

**Structural basis for transcription initiation by HrdB regulon in *Streptomyces coelicolor***

Guiyang Liu and Jianting Zheng\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:05-17:10

**Introduction**

Prof. Linquan Bai

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:10-17:20

**Self-resistance of the ansamitocin producer *Ac. pretiosum* ATCC31280**

Xinran Wang and Linquan Bai\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:20-17:25

**Structure-directed engineering of thioesterase domain toward improved chain release of unnatural polyene antibiotics**

Yucong Zhou, Ting Shi, Zhen Qi, Qianjin Kang, Jianting Zheng, Yilei Zhao, Linquan Bai\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:25-17:30

**ATP/ADP-dependent carbamoylations in the biosynthesis of ansamycins**

Jianhua Wei, Yucong Zhou, Jianting Zheng, Qianjin Kang and Linquan Bai\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:30-17:35

**Comparative transcriptome-based mining of genes involved in polyether antibiotics export**

Xian Liu, Jin Li, Xiaojie Zhang, Yuanting Wu and Linquan Bai\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University

17:35-17:38

**Pathway redesign to produce rearranged acarbose analogs with improved activity  
in *Actinoplanes* spp.**

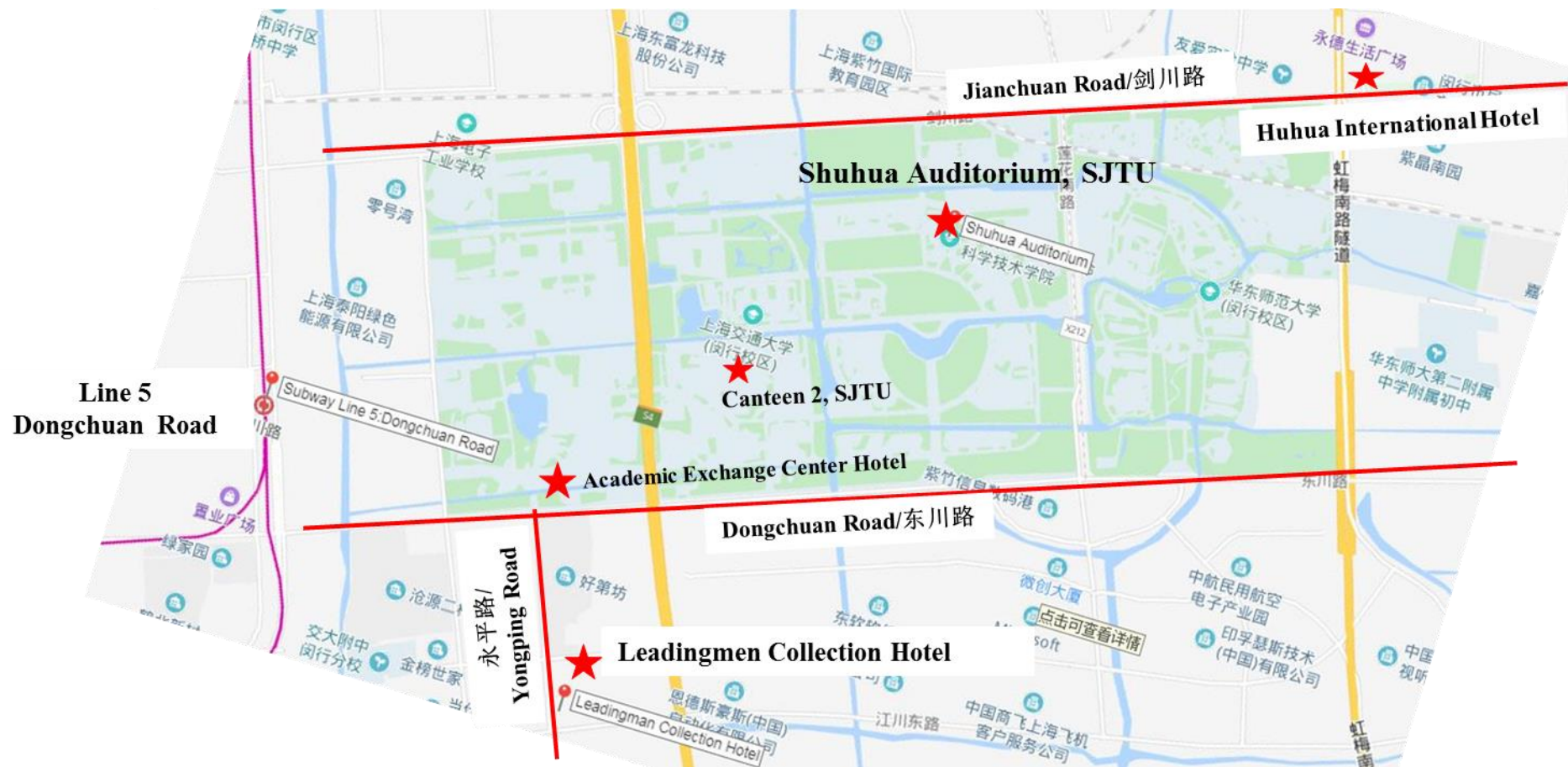
Xin Zhang, Huixin Xie, Qinqin Zhao and Linqun Bai\*

State Key Laboratory of Microbial Metabolism, School of Life Sciences and  
Biotechnology, Shanghai Jiao Tong University

**17:38-17:50 Panel Discussion**

**17:50-18:10 Awards and Closing Ceremony**

**18:30 Dinner** (Bus to Academic Exchange Center Hotel, SJTU)





### **雷汀曼酒店（上海交大店）**

上海市闵行区永平南路178号，021-33882999

**Leadingmen Collection Hotel (SJTU)**

No.178 South Yongping Road, Minhang District



### **沪华国际大酒店（上海吴泾店）**

上海市闵行区剑川路368号（虹梅南路路口）021-64508999

**Huhua International Hotel (Wujing)**

No.368 Jianchuan Road, Minhang District



## Washing Room

