

The 2nd A3 Foresight Symposium on “Chemical & Synthetic Biology of Natural Products”

Dates: May 22-24, 2017

Grabel Hotel and Jeju ICC, Korea

A3 Foresight Network



인하대학교
INHA UNIVERSITY

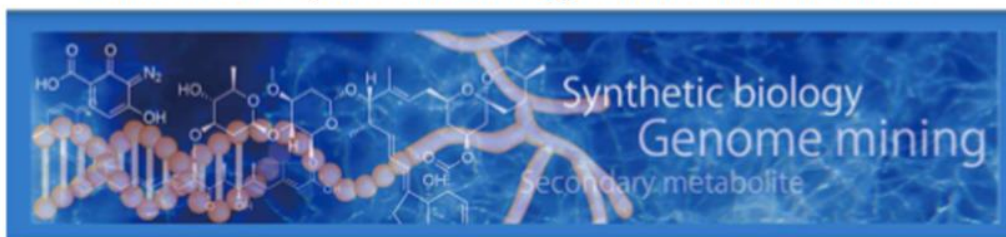


上海交通大学
SHANGHAI JIAO TONG UNIVERSITY



東京大学
THE UNIVERSITY OF TOKYO

Chemical & Synthetic Biology of Natural Products

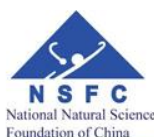


<http://a3-chemical-biology.jp/en/>

● A3 Representative PIs

- Prof. Eung-Soo Kim (Inha Univ. Korea)
- Prof. Zixin Deng & Prof. Linqun Bai (Shanghai Jiatong Univ. China)
- Prof. Yasuo Ohnishi (Univ. of Tokyo. Japan)

- **Objective:** To construct an Asian academic research hub for natural products: 3-way international collaboration on chemical & synthetic biology of natural products through *Streptomyces* genome mining, artificial chromosome engineering, and synthetic cell factory design.



JSPS 日本学術振興会
Japan Society for the Promotion of Science

Day 1 (Monday, 22 May)

- 12:00 ~ 13:30 Arrival at Jeju airport and shuttle bus to the Grabel Hotel
- 13:30 ~ 14:30 On-site registration and check-in

Session 1 Opening Ceremony and Delegate Introduction

- 14:30 ~ 14:35 Opening remarks by Prof. Eung-Soo Kim
- 14:35 ~ 14:40 Congratulatory remarks by Prof. Zixin Deng and Prof. David Sherman
- 14:40 ~ 15:00 Self-introduction of Japanese delegate (chaired by Yasuo Ohinishi)
- 15:00 ~ 15:20 Self-introduction of Chinese delegate (chaired by Linqun Bai)
- 15:20 ~ 15:40 Self-introduction of Korean delegate (chaired by Heung-Shick Lee)

Session 2 Research Presentation

- 15:50 ~ 16:05 Akimasa MIYANAGA (Tokyo Institute of Technology)
Structural analysis of macrolactam biosynthetic enzymes
- 16:05 ~ 16:20 Chitose MARUYAMA (Fukui Prefectural University)
Biosynthesis of the peptide side chains in streptothricin-related antibiotics
- 16:20 ~ 16:25 Hiroya TOMITA (The University of Tokyo)
Identification and characterization of a novel cytochrome P450 catalyzing tyrosine nitration in rufomycin biosynthesis (ISBA2017 poster S07_P14)
- 16:25 ~ 16:30 Wei Li THONG (The University of Tokyo)
Novel polyketides discovered via activation of cryptic genes from *Streptomyces* (ISBA2017 poster S09_P13)
- 16:30 ~ 16:35 Yosi NINDITA (Hiroshima University)
Wide genome deletions in *Streptomyces rochei* led to the production of silent secondary metabolites (ISBA2017 poster S05_P11)
- 16:35 ~ 16:40 Moriyuki KAWAUCHI (The University of Tokyo)
Soil cultivation system for physiological analysis of *Streptomyces griseus* (ISBA2017 poster S11_P06)

Coffee Break

- 17:00 ~ 17:20 Shuangjun LIN (Shanghai Jiao Tong University)
Carboxyl methylation, a chemical and biological protection involved in the streptonigrin biosynthesis
- 17:20 ~ 17:40 Yinhua LU (Shanghai Institute of Plant Physiology & Ecology, CAS)
***Streptomyces* genome engineering for overproducing bioactive secondary metabolites and related enabling technologies**
- 17:40 ~ 17:55 Xuming MAO (Zhejiang University)
Converging regulation of daptomycin biosynthesis in *Streptomyces roseosporus* by PhoP and AdpA transcriptional regulators
- 18:00 ~ 18:20 Hwa Sung Shin (Inha University)
Soft tissue engineering as alternatives to animal tests
- 18:20 ~ 18:40 Byung-Kwan Cho (KAIST)
The dynamic transcriptional and translational landscapes of Streptomyces
- 18:40 ~ 18:55 Yuvaraj Haldorai (Dongguk University)
Raman-based analysis of amphotericin B on a cellular level
- 19:00 ~ 20:00 Group photo & dinner

Day 2 (Tuesday, 23 May)

Session 3 Post-doc and Student Presentations (3 min per person)

- 09:00 ~ 9:48 Presentations by Chinese post-doc and students
Dr. Tingting HUANG, Zhen QI, Yuanting WU, Qinqin Zhao, Huixin XIE, Xiaoyu CHENG, Yucong ZHOU, Xiaojie ZHANG, Yingyi DUAN, Xiaozheng WANG, Xiaoqing ZHENG, Guixi GAO, Guiyang YU, Gong ZHAO, Min XU, Lingxin KONG
- 10:00 ~ 10:54 Presentations by Japanese students
Kei SATO, Kaoru SONE, Takeshi TSUNODA, Hayama TSUTSUMI, Danyao DU, Yuki OGAWA, Abrory Agus Cahya PRAMANA, Akira KANADA, Masaya KOBAYASHI, Kazuya TERAMOTO, Kei KUDO, Kanki MATSUDA, Haruka NIIKURA, Rina SAKAGAMI, Aiko TESHIMA, Amirudin Akhmad FAUZI, Miho SUMIYOSHI, Ayaka TATSUKAWA

Coffee Break

- 11:15 ~ 11:48 Presentations by Korean students
Hee-Ju NAH, Hye-Jin KIM, Jin-young JANG, Ji-Hoon PARK, Chi-Young HAN, Dong Seok LEE, Namil LEE, Yujin JEONG, Yongjae LEE, Soonkyu HWANG, Woori KIM
- 12:00 ~ 12:10 Closing ceremony and awards presentation
- 12:10 ~ 13:30 Lunch and shuttle bus to Jeju ICC

Day 3 (Wednesday, 24 May)

Session 4 A3 Foresight Network Session at ISBA2017

- 10:05 ~ 10:15 Student awardee presentation
- 10:15 ~ 10:35 Eung-Soo Kim, Inha University, Korea
Chemical & Synthetic Biology of Natural Products through *Streptomyces* Genome Mining, Artificial Chromosome Engineering, and Synthetic Cell Factory
- 10:35 ~ 10:55 Kenji Arakawa, Hiroshima University, Japan
Manipulation of Regulatory Pathway Controlled by Signaling Molecules SRBs, Inducer of Antibiotic Production in *Streptomyces rochei*, for Genome Mining
- 10:55 ~ 11:15 Hiroyasu Onaka, The University of Tokyo, Japan
Dissection of Goadsporin Biosynthesis by in vitro Reconstitution Leading to Designer Analogs Expressed *in vivo*
- 11:15 ~ 11:35 Jun Xu, Shanghai Jiao Tong University, China
Biosynthetic Studies of Two Bioactive Molecules Produced by a Mangrove Derived *Streptomyces xiamenensis* 318 and Its Potential as a Chassis Cell for Producing
- 11:35 ~ 11:55 Weishan Wang, Institute of Microbiology CAS, China
Optimization of The Expression of Secondary Metabolite Pathways in *Streptomyces*
- 11:55 ~ 12:15 Pil Kim, The Catholic University, Korea
Uses of Heme from *Corynebacterium glutamicum* for Bacteria, Plants, and Animals

Presentation from Postdocs or students (Japan)

(1) Type II polyketide synthase utilizing HCS cassette for β -alkylation

Kei Sato, Kosuke Yokota, Yohei Katsuyama and Yasuo Ohnishi

Graduate School of Agricultural and Life Sciences, The University of Tokyo

(ISBA2017 poster S07_P15)

(2) *In vitro* analysis of the biosynthesis of 4-methyloxazoline-containing nonribosomal peptides, JBIR-34 and -35

Kaoru Sone¹, Yohei Katsuyama¹, Kazuo Shin-ya², Yasuo Ohnishi¹

¹Graduate School of Agricultural and Life Sciences, The University of Tokyo

²National Institute of Advanced Industrial Science and Technology (AIST)

(ISBA2017 poster S07_P08)

(3) Pyrrolidine ring formation in the biosynthesis of JBIR-126

Takeshi Tsunoda¹, Yohei Katsuyama¹, Miho Izumikawa², Junko Hashimoto²,

Manabu Fujie³, Kousuke Ohyama⁴, Masahito Yoshida⁴, Noriyuki Satoh³, Takayuki Doi⁴, Kazuo Shin-ya⁵, Yasuo Ohnishi¹

¹Graduate School of Agricultural and Life Sciences, The University of Tokyo

²Japan Biological Informatics Consortium (JBIC)

³Okinawa Institute of Science and Technology Graduate University

⁴Graduate School of Pharmaceutical Sciences, Tohoku University

⁵National Institute of Advanced Industrial Science and Technology (AIST)

(ISBA2017 poster S09_P05)

(4) Analysis of the pathway for the biosynthesis of benzastatin derivatives

Hayama Tsutsumi¹, Yohei Katsuyama¹, Miho Izumikawa², Motoki Takagi², Manabu Fujie³, Noriyuki Sato³, Kazuo Shin-ya⁴, Yasuo Ohnishi¹

¹Department of Biotechnology, Graduate School of Agricultural and Life Sciences, The University of Tokyo

²Japan Biological Informatics Consortium (JBIC)

³Okinawa Institute of Science and Technology Graduate University

⁴National Institute of Advanced Industrial Science and Technology (AIST)

(ISBA2017 poster S09_P07)

(5) *In vitro* analysis of a type II polyketide synthase responsible for polyene formation

Danyao Du¹, Yohei Katsuyama¹, Kazuo Shin-ya², Yasuo Ohnishi¹

¹Department of Biotechnology, Graduate School of Agricultural and Life Sciences, The University of Tokyo

²National Institute of Advanced Industrial Science and Technology (AIST)

(ISBA2017 Poster S07_P09)

(6) Modification of ligand specificity of XylS through directed evolution

Yohei Katsuyama, Yuki Ogawa, Kento Ueno and Yasuo Ohnishi

The Graduate School of Agricultural and Life Sciences, The University of Tokyo

(ISBA2017 poster S03_P04)

(7) Analysis of intergeneric bacteria induced specialized metabolites with antibiosis from soil isolated actinomycetes

Abroy Agus Cahya Pramana¹, Shumpei Asamizu¹, Yoshinori Sugai¹, Hiroyasu Onaka¹

¹Graduate School of Agricultural and Life Sciences, The University of Tokyo

(8) Analysis of interaction between secondary metabolisms inducing peptide goadsporin and Ffh

Akira Kanada¹, Taro Ozaki¹, Yoshinori Sugai¹, Shumpei Asamizu¹, Toshiya Senda², Hiroyasu Onaka¹

¹Graduate School of Agricultural and Life Sciences, The University of Tokyo

²Structural Biology Research Center, Photon Factory, Institute of Materials Structure Science, High Energy Accelerator Research Organization

(ISBA2017 Poster S01_P01)

(9) Structural studies on the biosynthesis of cyclolavandulyl skeleton catalyzed by an unprecedented terpene synthase

Masaya Kobayashi, Takeo Tomita, Makoto Nishiyama, Tomohisa Kuzuyama

Biotechnology Research Center, The University of Tokyo

(ISBA2017 Poster S09_P14)

(10) Elucidation of multistep reaction cascade catalyzed by the diterpene cyclase CotB2

Kazuya Teramoto, Makoto Nishiyama, Tomohisa Kuzuyama

Biotechnology Research Center, The University of Tokyo

(ISBA2017 Poster S09_P03)

(11) Biosynthetic origin of the hydroxamic acid moiety of trichostatin A: identification of unprecedented enzymatic machinery involved in hydroxylamine transfer

Kei Kudo¹, Taro Ozaki¹, Kazuo Shin-ya², Makoto Nishiyama¹, Tomohisa Kuzuyama¹

¹Biotechnology Research Center, The University of Tokyo

²National Institute of Advanced Industrial Science and Technology (AIST)

(ISBA2017 Poster S09_P08)

(12) Enzymatic properties of *N*-formimidoyl synthase in the BD-12 biosynthesis

Haruka Niikura¹, Chitose Maruyama¹, Yasushi Ogasawara², Tohru Dairi², Yoshimitsu Hamano¹

¹Department of Bioscience, Fukui Prefectural University

²Department of Engineering, Hokkaido University

(ISBA2017 Poster S07_P41)

(13) Functional analysis of an aminoacyl-tRNA-dependent peptide synthase involved in the biosynthesis of a streptothricin-related compound

Kanki Matsuda¹, Chitose Maruyama¹, Junko Hashimoto², Kazuo Shin-ya³, Yoshimitsu Hamano¹

¹Department of Bioscience, Fukui Prefectural University

²Japan Biological Informatics Consortium (JBIC)

³National Institute of Advanced Industrial Science and Technology (AIST)
(ISBA2017 Poster S07_P53)

(14) Biosynthesis of a streptothricin analogue possessing O-acylpeptide side chain

Rina Sakagami¹, Chitose Maruyama¹, Junko Hashimoto², Kazuo Shin-ya³, Yoshimitsu Hamano¹

¹Department of Bioscience, Fukui Prefectural University

²Japan Biological Informatics Consortium (JBIC)

³National Institute of Advanced Industrial Science and Technology (AIST)
(ISBA2017 Poster S07_P40)

(15) Overview of biosynthetic pathway of SRB molecules that induce antibiotic production in *Streptomyces rochei*

Aiko Teshima and Kenji Arakawa

Department of Molecular Biotechnology, Graduate school of Advanced Sciences of Matter, Hiroshima University

(ISBA2017poster S07_P54)

(16) Altering the phenotypes of secondary metabolites and morphological differentiation in the plasmidless mutants of *Streptomyces rochei*

Amirudin Akhmad Fauzi, Yiwen Zhang, Yosi Nindita, Kenji Arakawa

Department of Molecular Biotechnology, Graduate School of Advanced Sciences of Matter, Hiroshima University

(17) Analysis of structural diversity of butenolide-type signaling molecules in *Streptomyces* species

Miho Sumiyoshi, Aiko Teshima, Kenji Arakawa

Department of Molecular Biotechnology, Graduate school of Advanced Sciences of Matter, Hiroshima University

(18) Biosynthetic investigation of azoxyalkene compounds

Ayaka Tatsukawa¹, Takuya Kishimoto¹, Hirofumi Kunitake¹, Atsushi Fukumoto², Yojiro Anzai², Kenji Arakawa¹

¹Department of Molecular Biotechnology, Graduate school of Advanced Sciences of Matter, Hiroshima University

²Faculty of Pharmaceutical Sciences, The University of Toho

Presentation from Postdocs or students (Korea)

(1) Streptomyces Artificial Chromosome System for Cloning and Heterologous Expression of Natural Product Biosynthetic Gene Cluster

Hee-Ju Nah, Hye-Rim Pyeon, Si-Sun Choi and Eung-Soo Kim

Department of Biological Engineering, Inha University

(ISBA2017 poster S09_P24)

(2) Redesign of disaccharide-polyene structure for improvement of antifungal activity and solubility

Hye-Jin Kim, Jin-Young Jang, Chi-Young Han, Si-Sun Choi and Eung-Soo Kim

Department of Biological Engineering, Inha University

(ISBA2017 poster S09_P25)

(3) Large operon-reporter based strategy for overproduction of polyene NPP B1 in a rare actinomycetes, *Pseudonocardia autotrophica*

Jin-Young Jang, Hye-Jin Kim, Chi-Young Han, Si-Sun Choi and Eung-Soo Kim

Department of Biological Engineering, Inha University

(ISBA2017 poster S09_P25)

(4) Pathway optimization for improving cis-cis muconic acid production in *Escherichia coli*.

Ji-Hoon Park, Han-Na Lee, Si-Sun Choi and Eung-Soo Kim

Department of Biological Engineering, Inha University

(5) Deletion of antibiotic Down-Regulatory gene *whiB4* for improvement of NPP B Productivity in *Pseudonocardia autotrophica*

Chi-Young Han, Hye-Jin Kim, Jin-Young Jang, Si-Sun Choi and Eung-Soo Kim

Department of Biological Engineering, Inha University

(6) Role of the *Corynebacterium glutamicum whcD* gene in stress responses

Dong Seok Lee and Heung-Shick Lee

Department of Biotechnology and Bioinformatics, College of Science and Technology, Korea University

(7) Systematic integration of multi-omics data elucidates translational regulation in the FK506 producer *Streptomyces tsukubaensis*

Namil Lee, Yujin Jeong, Jinkyoo Chung, Yongjae Lee, Woori Kim, Suhyung Cho, Bernhard Palsson,

and Byung-Kwan Cho
Department of Biological Sciences, KAIST

(8) Systematic integration of meta-structural data reveals the diverse regulatory features in *Streptomyces*

Yujin Jeong, Namil Lee, Soonkyu Hwang, Youngeun Yeun, Eunju Yi, and Byung-Kwan Cho
Department of Biological Sciences, KAIST

(9) Improvement of protein production through targeted engineering based on ribosome profiling *in vitro*

Yongjae Lee, Namil Lee, Byung-Kwan Cho
Department of Biological Sciences, KAIST

(10) Multi-omics based genome-level translation efficiency analysis and high-yield antibiotics production through genome editing in *Streptomyces*

Soonkyu Hwang, Yujin Jeong, Namil Lee, Byung-Kwan Cho
Department of Biological Sciences, KAIST

(11) Multi-strain comparison analysis of *Streptomyces venezuelae* to reveal comprehensive genomic parts

Woori Kim, Namil Lee, Yujin Jeong, Byung-Kwan Cho
Department of Biological Sciences, KAIST

Presentation from Postdocs or students (China)

(1) Biosynthetic of Pyridomycin: an Antimycobacterial Antibiotic

Dr. Tingting HUANG
Shanghai Jiao Tong University

(2) Biosynthesis and Yield Improvement of Ansamitocin P-3 in *Nocardioopsis* EGI80425

Xiaoyu CHENG
Shanghai Jiao Tong University

(3) Divergent Biosynthesis of Indole Alkaloids FR900452s and Spiro-maremycins

Yingyi DUAN
Shanghai Jiao Tong University

(4) Biosynthesis of an Angular Aromatic Polyketide Murayaquinone via Oxidative Rearrangement from a Linear Anthrene Precursor

Guixi GAO

Shanghai Jiao Tong University

(5) Functional Comparative Genomics of Acarbose Over-production

Huixin XIE

Shanghai Jiao Tong University

(6) Deciphering the Cryptic Demethoxylation Indispensable for Xanthone Formation in Xantholipin Biosynthesis

Dr. Lingxin KONG

Shanghai Jiao Tong University

(7) Biosynthesis and Directed Accumulation of Less Toxic Pimaricin Derivatives via Genetic Engineering

Zhen QI

Shanghai Jiao Tong University

(8) Investigation of A New Pictet-Spenglerase StnK2

Xiaozheng WANG

Shanghai Jiao Tong University

(9) Morphological Engineering of *Actinosynnema Pretiosum* ATCC31280 for Improved Ansamitocin Production

Yuanting WU

Shanghai Jiao Tong University

(10) LEXAS Facilitated Genome Mining of Bioactive SMs in *Streptomyces*

Dr. Min XU

Shanghai Jiao Tong University

(11) Multiple Hydrolases Catalyze the Maturation of Blastidicin S from Leucylblastidicin S in *Streptomyces lividans*

Guiyang YU

Shanghai Jiao Tong University

(12) Functional Comparative Genomic Studies on Salinomycin Over-production

Xiaojie ZHANG

Shanghai Jiao Tong University

(13) Structural Basis of the Substrate Preference for Thymidylate Synthase MilA and N-glycosidase MilB in the Initial Steps of Mildiomycin Biosynthesis in *Streptomyces rimofaciens* ZJU5119

Gong ZHAO

Shanghai Jiao Tong University

(14) Discovery of a Shunt Metabolite and Titer Improvement of Acarbose

Qinqin ZHAO

Shanghai Jiao Tong University

(15) Pyrrolidine Formation in Anisomycin Biosynthesis

Dr. Xiaoqing ZHENG

Shanghai Jiao Tong University

(16) Crystallization of the Thioesterase Domain for Elucidating the Polyene Chain Release and Ring Closure

Yucong ZHOU

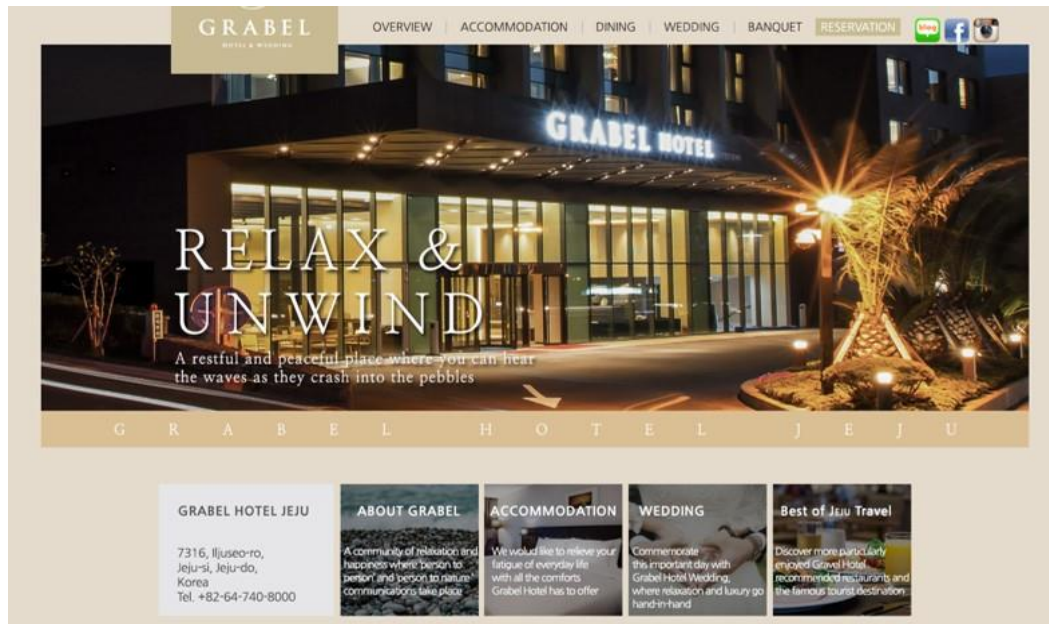
Shanghai Jiao Tong University

Venue

Grabel Hotel

7316, Iljuseo-ro, jeju-do, Korea

Tel.+82-64-740-8000

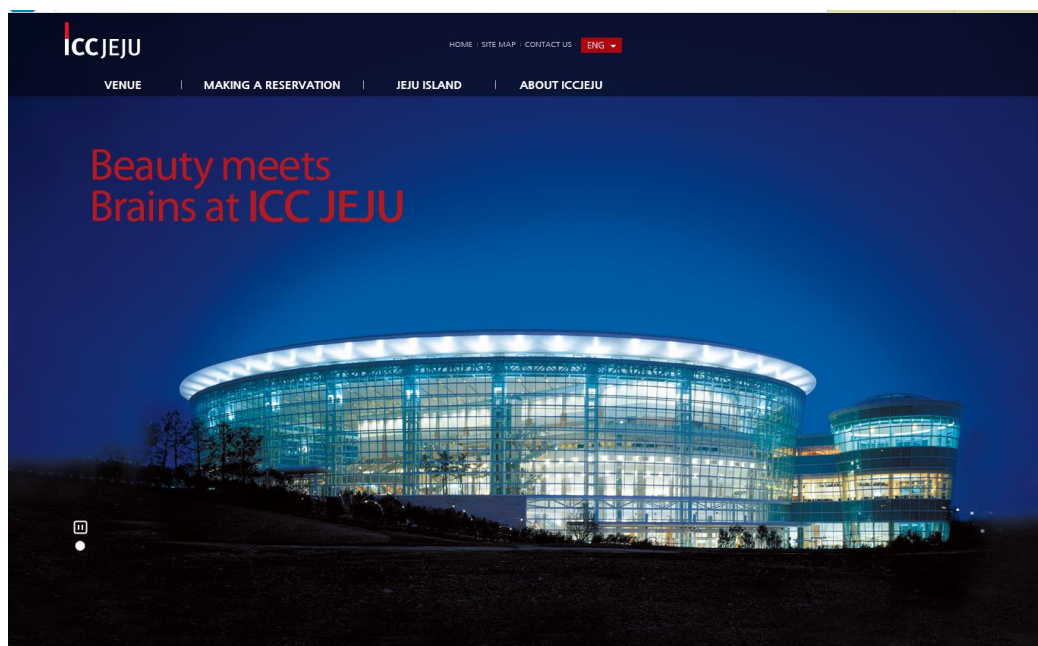


The image shows a screenshot of the Grabel Hotel website. At the top, there is a navigation menu with links for OVERVIEW, ACCOMMODATION, DINING, WEDDING, BANQUET, and RESERVATION, along with social media icons for LINE, Facebook, and Instagram. The main banner features a night photograph of the Grabel Hotel building with its name illuminated in blue. Overlaid on the image is the text "RELAX & UNWIND" in large white letters, followed by a smaller line of text: "A restful and peaceful place where you can hear the waves as they crash into the pebbles". Below the banner, there is a horizontal row of four content boxes: "GRABEL HOTEL JEJU" with contact information, "ABOUT GRABEL" describing the hotel's atmosphere, "ACCOMMODATION" listing room types, "WEDDING" highlighting wedding services, and "Best of Jeju Travel" promoting local attractions.

Jeju ICC

2700 Jungmun,Seogwipo,Jeju-do, Korea

Tel: +82-64-735-1000



The image shows a screenshot of the ICC JEJU website. The top navigation bar includes the ICC JEJU logo, a language selector set to "ENG", and links for HOME, SITE MAP, and CONTACT US. Below the navigation, there is a secondary menu with links for VENUE, MAKING A RESERVATION, JEJU ISLAND, and ABOUT ICCJEJU. The main banner features a night photograph of the ICC JEJU building, a large circular structure with a glass facade illuminated from within. The text "Beauty meets Brains at ICC JEJU" is displayed in a large, bold, red font. In the bottom left corner, there is a small icon of a person and a white circle.