

PROGRAM

March 31 (Friday) Kagawa International Conference Hall

Registration (Conference Hall)

Opening ceremony

Special keynote lecture

Special lecture

Special program “Labeling of Rare Sugars”

Session 1 Food-related properties of rare sugars

Reception Banquet (Rhiga Hotel Zest Takamatsu)

April 1 (Saturday) Kagawa International Conference Hall:

Session 2 Rare sugar production (1) & (2)

Session 3 Rare sugars for medical field (1) & (2)

Session 4 Physicochemical properties of rare sugars

Session 5 Various usages of rare sugars

April 2 (Sunday) Exhibition Hall & Kagawa International Conference Hall:

Poster presentation (Exhibition Hall)

Award & closing ceremony

March 31 (Friday)
Kagawa International Conference Hall

09:30~10:30 Registration (Conference Hall)

Opening Ceremony

10:30~10:45

Overall facilitator: Kazuya Akimitsu (Kagawa University, Japan)

10:30~ Congratulation Remarks
Yoshiyuki Kakehi (President of Kagawa University, Japan)

 Welcome & Keynote Address
Ken Izumori (President of International Society of Rare Sugars)

Special Keynote Lecture

10:45~11:20

Chair: Yuma Tani (Rare Sugar International Corporation, Japan)

10:45~11:20 “Health & Carbohydrates”
Satoru Yamada (Vice President, Director of Endocrinology and Metabolism
Department, and Chief of Diabetes Center of Kitasato University Kitasato
Institute Hospital, Japan)

Special Lecture

11:20~12:20

Chair: Yuma Tani (Rare Sugar International Corporation, Japan)

11:20~12:20 Special lecture: “Nutrition & Health”
Presenter I: **Kevin Miller** (President of Whole Grain Initiative, USA)
 “Processed foods, ingredients, and strategies to promote”
Presenter II: **Sebastian Smith** (Ingredion Incorporated, USA)
 “Sugar Reduction Solutions & Market Trends”

Group photo session

12:20~12:30

Lunch

12:30~13:30

13:30~13:40 Congratulation Remarks
Toyohito Ikeda (Governor of Kagawa Prefecture, Japan)

Special Program
“Labeling of Rare Sugars”

13:40~15:00

Chair: Yuma Tani (Rare Sugar International Corporation, Japan)

13:40~15:00 Panel discussion I “Rare sugar labeling in Markets”
Panel discussion II “A proposal for functional sugars in future”
Modulator:
Yuma Tani (Rare Sugar International Corporation, Japan)
Panelists: Food industries’ representatives
Kevin Miller (Whole Grain Initiative, USA)
Chiya Kuraishi (Coca-Cola Tokyo Research & Development Co. Ltd., Japan)
Takanobu Higashiyama (HAYASHIBARA CO., LTD., Japan)
Ed Rogers (Bonumose, Inc., USA)
Sebastian Smith (Ingredion Incorporated, USA)

15:00~15:30 Coffee break

Session 1

Food-related properties of rare sugars

15:30~16:30

Chair: Masahiro Ogawa (Kagawa University, Japan)

- 15:30~15:44 The influence of fat-carbohydrate content in diet on anti-obesity effects
S01 of D-allulose in rats
Masaru Ochiai (Kitasato University, Japan)
- 15:45~15:59 Physicochemical parameters, volatile compounds and organoleptic properties of
S02 bread prepared with substituted sucrose with rare sugar D-allulose
Saranta Sawettanun (Kagawa University, Japan)
- 16:00~16:14 Effect of rare sugars on soy sauce brewing and related microorganisms
S03 **Miku Miyoshi** (Kagawa University / Kagawa Prefectural Industrial Technology
Center, Japan)
- 16:15~16:29 Dietary D-allulose reduces body fat accumulation in rats fed medium-chain
S04 triglyceride diets
Takako Yamada (Matsutani Chemical Industry Co., Ltd., Japan)

Reception Banquet

17:30~20:00

Rhiga Hotel Zest Takamatsu

- 17:30~18:00 Welcome drink
18:00~20:00 Reception banquet

April 1 (Saturday)

Kagawa International Conference Hall

Session 2-1

Rare sugar production (1)

09:00~10:30

Chair: Ken Izumori (Kagawa University, Japan)

- 09:00~09:14 **S05** Engineering D-allulose 3-epimerase from *Clostridium cellulolyticum* for improved thermostability using directed evolution facilitated by a nonenzymatic colorimetric screening assay
Wanmeng Mu (Jiangnan University, China)
- 09:15~09:29 **S06** Enzymatic characterization to produce D-allose from D-allulose by a recombinant L-rhamnose isomerase from *Paenibacillus baekrokdamisoli*
Chang-Su Park (Daegu Catholic University, Republic of Korea.)
- 09:30~09:44 **S07** Production of eight ketoheptoses using transketolase from *Thermus thermophilus* HB8 and D-tagatose 3-epimerase from *Pseudomonas cichorii* ST-24
Akihide Yoshihara (Kagawa University, Japan)
- 09:45~09:59 **S08** Effect of organic germanium on isomerization for monosaccharide
Kenji Morimoto (Kagawa University, Japan)
- 10:00~10:14 **S09** Process for producing a high-maltose syrup from rice (*Oryza sativa* L.) bran
Garry A. Diopol (Industrial Technology Development Institute, Philippines)
- 10:15~10:29 **S10** Improved production process for the low-calorie sugar isomaltulose
Kamaljit Sood (Sainc Energy Limited, UK)

10:30~10:50 Coffee break

Session 2-2

Rare sugar production (2)

10:50~12:05

Chair: George W.J. Fleet (Oxford University, UK)

- 10:50~11:04 Development of food-grade expression system for preparing
S11 D-allulose-3-epimerase
Qianzhen Dong (Chinese Academy of Sciences, China)
- 11:05~11:19 X-ray structure of recombinant ribitol dehydrogenase from *Klebsiella oxytoca*
S12 **Hiromi Yoshida** (Kagawa University, Japan)
- 11:20~11:34 X-ray structure of allose-binding protein coded in allose operon
S13 **Shigehiro Kamitori** (Kagawa University, Japan)
- 11:35~11:49 Synthesis of 5-thiosucrose from D-allulose and investigation of protecting
S14 groups
Atsushi Ueda (Nagasaki University, Japan)
- 11:50~12:04 Synthesis of 3-deoxy-3-fluoro-D-xylulose
S15 **Toda Stankovic** (University of Vienna, Austria)

Lunch

12:05~13:00

Session 3-1

Rare sugars for medical field (1)

13:00~14:30

Chair: **Katsuya Yamada** (Hirosaki University, Japan)

- 13:00~13:14 Growth Inhibitory Effects of Rare Sugar D-Allose on Renal Cell Carcinoma
S16 **Rikiya Taoka** (Kagawa University, Japan)
- 13:15~13:29 The therapeutic effect of D-allose on colitis-associated carcinogenesis
S17 **Xiaodong Li** (Kagawa University, Japan)
- 13:30~13:44 Antitumor effect of D-allose on glioblastoma cell lines
S18 **Takahiro Kanda** (Kagawa University, Japan)
- 13:45~13:59 Antiproliferative effects of D-allose associates with the delayed cell cycle
S19 transition in pancreatic ductal adenocarcinoma
Asadur Rahman (Kagawa University, Japan)
- 14:00~14:14 Molecular analysis and physiological significance of D-allulose and D-tagatose
S20 transport by glucose transporters
Kazuyo Kamitori (Kagawa University, Japan)
- 14:15~14:29 L-Glucose: another path for cancer cells
S21 **Katsuya Yamada** (Hirosaki University, Japan)

14:30~15:00 Coffee break

Session 3-2

Rare sugars for medical field (2)

15:00~16:30

Chair: Koji Murao (Kagawa University, Japan)

- 15:00~15:14 **S22** D-Allulose activates satiety neurons and inhibits appetite neurons: an outstanding ability to regulate feeding and metabolism
Toshihiko Yada (Kansai Electric Power Medical Research Institute / Gifu University, Japan)
- 15:15~15:29 **S23** D-Allulose activates pro-opiomelanocortin neurons in the hypothalamus and cooperates with glucagon-like peptide-1
Yermek Rakhat (Kansai Electric Power Medical Research Institute / Gifu University, Japan)
- 15:30~15:44 **S24** D-Allose attenuated RPMCs death induced by high dose of D-glucose via suppressing ER stress-initiated apoptotic signal pathway
Yuka Yamashita (Kagawa University, Japan)
- 15:45~15:59 **S25** Immunomodulatory effects of D-allose on the function of plasmacytoid dendritic cells
Katsuaki Hoshino (Kagawa University, Japan)
- 16:00~16:14 **S26** A study on the effect of D-allulose on suppressing postprandial hyperglycemia in patients with type 2 diabetes
Toshihiro Kobayashi (Kagawa University, Japan)
- 16:15~16:29 **S27** Release of intestinal hormone GLP-1 by D-allulose ameliorates hyperglycemia through gut - vagal afferent nerves - brain axis
Yusaku Iwasaki (Kyoto Prefectural University, Japan)

16:30~16:45 Coffee break

Session 4

Physicochemical properties of rare sugars

16:45~17:30

Chair: Tomohiko Ishii (Kagawa University, Japan)

- 16:45~16:59 Hydration behavior of hexoses revisited
S28 Kazuhiro Fukada (Kagawa University, Japan)
- 17:00~17:14 Thermodynamic study on the effect of monosaccharides on phase transitions of
S29 phospholipid bilayer membrane
Nobutake Tamai (Tokushima University, Japan)
- 17:15~17:29 Fingerprint of Hydrogen Bonding Network in Rare Sugar Single Crystal
S30 Tomohiko Ishii (Kagawa University, Japan)

Session 5

Various usages of rare sugars

17:30~18:45

Chair: Kazuya Akimitsu (Kagawa University, Japan)

- 17:30~17:44 Evaluation of rare ketohexoses as antiviral compound
S31 Syed Muniruzzaman (Xavier University of Louisiana, USA)
- 17:45~17:59 Rare Sugars as Insect Control Compounds
S32 Roger A Laine (Louisiana State University, USA)
- 18:00~18:14 Allitol and D-allulose in native *Itea* plant of Thailand, the *Itea riparia*
S33 Verasak Sahachaisaree (Thailand)
- 18:15~18:29 Characteristic analysis of *Itea virginica* transketolase 1 (IvTK1)
S34 Susumu Mochizuki (Kagawa University, Japan)
- 18:30~18:44 Functional analysis of rice phosphoglucose isomerase
S35 Kazuya Akimitsu (Kagawa University, Japan)

April 2 (Sunday)

Exhibition Hall & Kagawa International Conference Hall

Poster Presentation

09:00~12:00

Exhibition Hall

Poster presenters must stay and give a chance of discussion with audience in the front of each poster from 9:30 to 10:30 for odd-numbered posters and 10:30 to 11:30 for even-numbered posters.

Lunch

12:00~13:00

Award & Closing Ceremony

13:00~14:00

Kagawa International Conference Hall

13:00~13:30 Award ceremony

Chair: **Masaaki Tokuda** (Kagawa University, Japan)

Rare Sugar award

Chair: **Saisamorn Lumyong** (Chiang Mai University, Thailand)

Poster award

13:30~14:00 Closing ceremony

Closing remarks

Ken Izumori (Kagawa University, Japan)

George W.J. Fleet (Oxford University, UK)