

The 17th International Symposium on Blood Substitutes and Oxygen Therapeutics (XVII-ISBS-2019) — Program —

20 November 2019 (Wednesday)

Venue: Hotel Nikko Nara, the 4th floor

19:00-21:00 **Registration & Welcome Reception**

21 November (Thursday)

Morning Program

Venue: Nara Kasugano International Forum "IRAKA"

9:00 **Registration, Poster setting up**

Noh Theatre

9:30 **Opening Ceremony**

Hiromi Sakai & Chengmin Yang (Co-presidents, 17th ISBS-2019)
Hirosi Hosoi (President, Nara Medical University)

9:50-10:30 **Presidential Lecture-1**

Chair: Chengmin Yang (Inst. of Blood Transfusion, Chin. Acad. Med. Sci., China)

What is the most effective replacement for blood loss?

Thomas M. S. Chang

Depts. of Physiology, Medicine & Biomed. Eng., Faculty of Medicine, McGill University, Canada

10:30-11:10 **Presidential Lecture-2**

Chair: Hiroyuki Nishide (Waseda University)

Artificial red cells project in Japan

Hiromi Sakai

Department of Chemistry, Nara Medical University, Kashihara, Japan

11:10-11:20 **Break**

Program

11:20-12:00 **Plenary Lecture-1**

Chair: Jiaxin Liu (Inst. Blood Transfusion, Chin. Acad. Med. Sci.)

Blood component, transfusion requirements and mortality in the two largest phase III trials of hemoglobin-based oxygen carriers: Hemopure® and PolyHeme

Jonathan S. Jahr

Depts. of Anesthesiology and Perioperative Medicine, David Geffen School of Medicine at UCLA, Los Angeles, USA

12:00-12:40 **Plenary Lecture-2**

Chair: Akira Yoshioka (Nara Medical University)

Turning stem cells into platelets

Koji Eto

Department of Clinical Application, CiRA, Kyoto University, Kyoto, Japan

12:40-12:50 **Break**

Conference Rooms 1&2

12:50-13:30 **Luncheon Seminar-1**

Chair: Hiromi Sakai (Nara Medical University)

Big issues for the world malaria elimination

Shigeyuki Kano

Res. Inst. Natl Center for Global Health & Med., Tokyo, Japan

Reception Hall

13:30-13:50 **Poster-viewing**

Noh Theatre

13:40-13:50 **General Meeting of the Society of Blood Substitutes, Japan**

Afternoon Program

Noh Theatre

Session-1: Keys to Develop Blood Substitutes (1)

Chairs: Leif Bülow (Lund University)

Hiromi Sakai (Nara Medical University)

13:50-14:10 **Keynote Lecture-1**

History of blood substitutes research in Japan (tentative)

Koichi Kobayashi

Keio University, Tokyo, Japan

14:10-14:40 **Keynote Lecture-2**
Restoration of oxygen carrying capacity/delivery capacity in anemia
Marcos Intaglietta
 Department of Bioengineering, University of California, San Diego, La Jolla, USA

14:40-15:10 **Keynote Lecture-3**
Protein engineering in the design of safe and robust HBOCs
Leif Bülow
 Pure and Applied Biochemistry, Dept of Chemistry, Lund University, Lund, Sweden

15:10-15:50 **Plenary Lecture-3**
 Chair: Chengmin Yang (Inst. Blood Transfusion, Chin. Acad. Med. Sci.)
Preclinical investigation of polymerized porcine hemoglobin
Chao Chen
 Northwest University, X'ian, China

15:50-16:00 **Break**

Session-2: Keys to Develop Blood Substitutes (2)

Chairs: Feng Ma (Inst. Blood Transfusion, Chin. Acad. Med. Sci.)
 Hae Won Kim (Brown University)

16:00-16:30 **Keynote Lecture-4**
Acellular hemoglobin-based oxygen carrier (HBOC)-mediated bradycardia: another affair with nitric oxide?
Hae Won Kim and A. Gerson Greenburg
 Brown University, Providence, USA

16:30-17:00 **Keynote Lecture-5**
Human albumin based drug delivery: SNO-albumin dimer for cancer therapeutic application
Masaki Otagiri
 Sojo University, Kumamoto, Japan

17:00-17:20 **IL-1**
Hemoglobin vesicles treatment in future perinatal medicine: application of artificial oxygen carriers for pre-eclampsia
Hidenobu Ohta
 Department of Neuropsychiatry, Akita University Graduate School of Medicine, Akita, Japan

17:20-17:40 **IL-2**
Erythrocytes derived from hematopoietic stem cell-independent pathway
Feng Ma
 Inst. Blood Transfusion, Chin. Acad. Med. Sci., Chengdu, China

17:40-18:00 **IL-3**
Identification of potential chemical compounds able to trigger enucleation of immortalized human erythroid cell lines
Kenichi Miharada
 Div. Molecular Medicine and Gene Therapy, Lund Stem Cell Center, Lund University, Lund, Sweden

Conference Rooms 1&2

Session 3: Artificial Cells and Functional Liposomes

Chairs: János Szebeni (Semmelweis University)
Tatsuhiko Ishida (Tokushima University)

- 13:50-14:10 **IL-4**
Liposome-encapsulated hemoglobin: Review of the progress of a synthetic red cell
János Szebeni
Nanomedicine Research and Education Center, Semmelweis University, Budapest, Hungary
- 14:10-14:30 **IL-5**
Induction of B7-H3 positive myeloid-derived suppressor cells (MDSC) by liposomal nanoparticles
Hiroshi Azuma
Department of Pediatrics, Asahikawa Medical University, Asahikawa, Japan
- 14:30-14:50 **IL-6**
Immunological response to PEGylated liposomes: production of anti-PEG antibodies and their affection on PK of second dose
Tatsuhiko Ishida
Institute of Biomedical Sciences, Tokushima University, Tokushima, Japan
- 14:50-15:05 **OP-1**
Surface-anchored framework for generating RhD-epitope stealth red blood cells
Ben Wang
The Second Affiliated Hospital, School of Medicine, Zhejiang University, Hangzhou, China
- 15:05-15:20 **OP-2**
Evasion of the accelerated blood clearance phenomenon by polysarcosine coating of liposomes
Kon Son
RIKEN Cluster for Pioneering Research, School of Adv. Sci. & Eng., Waseda University, Tokyo, Japan
- 15:20-15:35 **OP-3**
Arginine-based cationic liposomes promoted antigen presentation and T cell activation *in vitro*
Tianshu Li
Waseda Research Institute for Science and Engineering, Waseda University, Tokyo, Japan
- 15:35-15:50 **OP-4**
Development of high-sensitive and rapid biomolecule detection method by using temperature-responsive fluorescent liposomes
Runkai Hu
Graduate School of Advanced Science and Engineering, Waseda University, Tokyo, Japan
- 15:50-16:00 **Break**

Session 4: Strategies to PEGylate HBOCs

Chairs: Seetharama Acharya (Albert Einstein College of Medicine)
Stefano Bruno (University of Parma)

- 16:00-16:20 **IL-7**
Pegylated HBOCs with higher oxygen affinity effectively target oxygen delivery to ischemic and/or hypoxic tissues
Peter E. Keipert
Keipert Corp. Life Sciences Consulting, San Diego, USA

- 16:20-16:40 **IL-8**
Increased oxygen extraction from RBCs during anemia by high O₂ affinity Hb in plasma: Combining supra plasma expansion with O₂ transfer catalysis by Hb for treating anemia
Seetharama Acharya
 Albert Einstein College of Medicine, Bronx, USA
- 16:40-17:00 **IL-9**
Different oxygen stress induced by high- and low-affinity PEGylated hemoglobin-based oxygen carriers in a Guinea pig exchange transfusion model
Stefano Bruno
 Department of Food and Drug, University of Parma, Parma, Italy
- 17:00-17:20 **IL-10**
Polymerized bovine hemoglobin derivatives by 8-arm PEG: Different abilities of oxygen delivery and unloading
Tao Hu
 Institute of Process Engineering, Chinese Academy of Sciences, Beijing, China
- 17:20-17:35 **OP-5**
Supramolecular ring-opening polymerization of hemoglobin and subsequent fixation using site-specific cross-linking within $\alpha_2\beta_2$ tetramers
Takashi Matsuhira
 Department of Chemistry, Nara Medical University, Kashihara, Japan
- 17:35-17:50 **OP-6**
Site-specific propylation of hemoglobin at Val-1(α) improves the structural and functional properties of di-PEGylated hemoglobin at Val-1(β)
Weili Yu
 Institute of Process Engineering, Chinese Academy of Sciences, Beijing, China
- 17:50-18:05 **OP-7**
A uniquely homogenous PEGylation method without significantly affecting hemoglobin oxygen affinity and cooperativity.
Brandon Reeder
 School of Life Sciences, University of Essex, Wivenhoe Park, Colchester, UK

Reception Hall

18:05-18:30 **Poster-viewing**

Noh Theatre

18:30-19:00 **Stage Show: Gagaku Instrumental Music Show**

19:00 **Commemorative Photograph**

Reception Hall

19:00-20:30 **Banquet**

21:00 **Building Closed**

22 November (Friday)

Morning Program

8:30 Registration

Poster-viewing

Noh Theatre

Session 5: Hemostasis and Artificial Platelets

Chairs: Rong Xia (Fudan University)
Shinji Takeoka (Waseda University)

9:00-9:20 **IL-11**

Bleeding management is coagulation management: the European approach of targeted coagulation therapy in massive bleeding

Judith Martini

Clinic for Anaesthesia and Intensive Care Medicine, Medical University Innsbruck, Austria

9:20-9:40 **IL-12**

Basic and clinical aspects of platelet transfusion refractoriness

Rong Xia

Department of Blood Transfusion, Huashan Hospital, Fudan University, Shanghai, China

9:40-10:10 **Keynote Lecture-6**

Innovative research approach to produce a large quantity of regenerated platelets/platelet substitutes in Japan

Yasuo Ikeda

Waseda University, and Keio University, Tokyo, Japan

10:10-10:40 **Keynote Lecture-7**

Evaluation of fibrinogen dodecapeptide(H12)-coated, ADP-encapsulated liposomes as hemostatic nanoparticles

Shinji Takeoka

Graduate School of Advanced Science and Engineering, TWInS, Waseda University, Tokyo, Japan

10:40-10:50 **Break**

10:50-11:10 **IL-13**

Megakaryocytes and platelets from novel human adipose tissue-derived mesenchymal stem Cells

Yumiko Matsubara

Clinical and Translational Research Center, Keio University School of Medicine, Tokyo, Japan

11:10-11:25 **OP-8**

Therapeutic potential of fibrinogen gamma-chain peptide-coated, ADP-encapsulated liposomes, as a synthetic platelet substitute, for post-cardiopulmonary bypass coagulopathy

Osamu Ishida

Dept. of Cardiovascular Surgery, National Defense Medical College, Tokorozawa, Japan

- 11:25-11:45 **IL-14**
Combination therapy using fibrinogen γ -chain peptide-coated, ADP-encapsulated liposomes and hemoglobin vesicles for trauma-induced massive hemorrhage in thrombocytopenic rabbits
Kohsuke Hagsawa
 Dept. of Physiology, National Defense Medical College, Tokorozawa, Japan
- 11:45-12:00 **OP-9**
Study on universal virus-inactivated plasma for Chinese population
Liguo Zhu
 Dept. of Blood Transfusion, Chinese PLA General Hospital, Beijing, China
- 12:00-12:15 **OP-10**
Antiplatelet and antithrombotic activity of a novel phthalide derivative (CD21) and its neuroprotective effect against ischemic stroke in rodents
Junrong Du
 Dept. of Pharmacology, West China School of Pharmacy, Sichuan University, Chengdu, China

Reception Hall

Session 6: Characterization of New HBOCs

Chairs: Chris Cooper (Essex University)
 Hirohisa Horinouchi (Saitama City Hospital)

- 9:00-9:20 **IL-15**
CMC regulatory considerations in the drug development of hemoglobin-based oxygen carriers
Yiping Jia
 Center for Biologics Evaluation and Research, Food and Drug Administration, Silver Spring, USA
- 9:20-9:40 **IL-16**
New design approaches for a recombinant hemoglobin based oxygen carrier
Chris Cooper
 School of Life Sciences, University of Essex, Colchester, UK
- 9:40-10:00 **IL-17**
Hemoglobin vesicle: resuscitation fluid for hemorrhagic shock
Hirohisa Horinouchi
 Saitama City Hospital, Saitama, Japan
- 10:00-10:20 **IL-18**
Crocodile hemoglobin: challenging and beyond
Sompong Klaynongsruang
 Faculty of Science, Khon Kaen University, Khon Kaen, Thailand
- 10:20-10:40 **IL-19**
Design of hemoglobin-polymer nano-assemblies for oxygen transfusion and other biomedical attempts
Yubin Huang
 Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, ChangChun, China
- 10:40-10:50 **Break**

Chairs: Andre Palmer (Ohio State Univ.)
Bonpei Takase (Natl. Defence Med. College)

- 10:50-11:10 **IL-20**
Chronic anti-arrhythmogenic effect of liposome-encapsulated hemoglobin (HbV) on the myocardium through improving myocardial electrical remodeling and the arrhythmogenic substrate in hemorrhagic shock heart syndrome
Bonpei Takase
Department of Intensive Care Medicine, National Defense Medical College, Japan
- 11:10-11:30 **IL-21**
PolyHb toxicity is determined by molecular weight
Pedro Cabrales
Department of Bioengineering, University of California San Diego, La Jolla, USA
- 11:30-11:50 **IL-22**
Designs and benefits of oxygen carriers from site-selectively coupled cross-linked hemoglobins
Aizhou Wang, and Ronald Kluger
Department of Chemistry, University of Toronto, Toronto, Ontario, Canada
- 11:50-12:10 **IL-23**
Mixtures of tense and relaxed state polymerized human hemoglobin regulate oxygen affinity and tissue construct oxygenation
Andre F. Palmer
William G. Lowrie Department of Chemistry and Biomolecular Engineering, The Ohio State University, Columbus, USA

Conference Rooms 1&2

Session 7: Gas Biology and ROS Control

Chairs: Kazuaki Taguchi (Keio University)
Alexey F. Topunov (Russian Academy of Sciences)

- 9:00-9:20 **IL-24**
Carbon monoxide bound Hemoglobin-vesicles are effective in treating inflammatory disorders
Kazuaki Taguchi
Faculty of Pharmacy, Keio University, Tokyo, Japan
- 9:20-9:40 **IL-25**
Biological roles of endogenous carbon monoxide in blood
Hiroaki Kitagishi
Dept. of Molecular Chemistry and Biochemistry, Doshisha University, Kyoto, Japan
- 9:40-9:55 **OP-11**
Encapsulation of S-nitrosoglutathione within liposomes for enhanced nitric oxide donor stability and delivery
Ye Cao[#], Yee Shan Wong[#]
School of Materials Science and Engineering, Nanyang Technological University, Singapore
[#] Co-first authors
- 9:55-10:10 **OP-12**
A novel S-sulphydrated human serum albumin suppresses reactive oxygen species induced by kidney injuries
Mayumi Ikeda
Dept. of Pharmacokinetics and Biopharmaceutics, Tokushima University, Tokushima, Japan

- 10:10-10:25 **OP-13**
Therapeutic effect of albumin-based nitric oxide donor on the renal fibrosis
Shun Oshiro
 Dept. of Biopharmaceutics, Graduate School of Pharmaceutical Sciences, Kumamoto University, Kumamoto, Japan
- 10:25-10:40 **OP-14**
Measures to prohibit post mortem hemoglobin mediated lipid oxidation in herring and rainbow trout
Semhar Ghirmai
 Dept. of Biology and Biological Engineering, Chalmers University of Technology, Gothenburg, Sweden
- 10:40-10:55 **OP-15**
Hemoglobin transition to membrane-bound state and its correlation with erythrocyte stability
Alexey F. Topunov
 Federal Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia
- 10:55-11:05 **Break**

Session 8: New PFC Materials

Charis: Marrie P. Krafft (University of Strasbourg)
 Katja B. Ferenz (University Hospital Essen)

- 11:05-11:25 **IL-26**
Advances in fluorocarbon-assisted oxygen delivery, diagnostics and theranostics
Marie Pierre Krafft
 Institut Charles Sadron, Centre National de la Recherche Scientifique, University of Strasbourg, Strasbourg, France
- 11:25-11:40 **OP-16**
Microsized perfluorocarbon-based oxygen carriers prepared via SPG membrane emulsification
Xiaoting Fu
 Dept. of Bioengineering, Univ. of Tokyo, Tokyo, Japan
- 11:40-11:55 **OP-17**
Does a perfluorooctylbromide-core improve the performance of albumin-derived perfluorocarbon-based artificial oxygen carriers?
Katja Bettina Ferenz
 Institute of Physiology, University of Duisburg-Essen, University Hospital Essen, Essen, Germany

Reception Hall

- 12:20-13:00 **Luncheon Seminar-2**
 Chair: Yasuo Ikeda (Waseda University, Keio University)
New therapy for hemophilia A by factor VIII mimicking bispecific antibody
Midori Shima
 Dept. of Pediatrics, Nara Medical University, Kashihara, Japan
 Sponsored by Chugai Pharmaceutical Co., Ltd.
- 13:00-13:20 **Break / Poster-viewing**

Afternoon Program

Noh Theatre

13:20-14:00 **Plenary Lecture-4**

Chair: Masanori Matsumoto (Nara Medical University)

Development and future of Chinese transfusion medicine

Jiixin Liu

Institute of Blood Transfusion, Chinese Academy of Medical Sciences, Chengdu, China

14:00-14:40 **Plenary Lecture-5**

Chair: Hiroshi Azuma (Asahikawa Medical University)

Current blood program and blood substitutes

Masahiro Satake

Japanese Red Cross Central Blood Institute, Tokyo, Japan

14:40-14:50 **Break**

Session 9: Transfusion Managements and Blood Substitutes

Chairs: Jiixin Liu (Inst. Blood Transfusion, Chin. Acad. Med. Sci.)
Masahiro Satake (Japanese Red Cross)

14:50-15:20 **Keynote Lecture-8**

Individualized red-cell transfusion strategy for non-cardiac surgery in adults: a prospective, open-label, randomized clinical trial

Jin Liu

Dept. of Anesthesiology, West China Hospital, Sichuan University, Chengdu, China

15:20-15:40 **IL-27**

Microvascular response to blood transfusion in a moderately anemic hamster model shows the importance of oxygen delivery over oxygen-carrying capacity.

Amy G. Tsai

Dept. of Bioengineering, University of California, San Diego, La Jolla, USA

15:40-16:00 **IL-28**

20 Year Journey of blood safety in China

Zhong Liu

Institute of Blood Transfusion, Chin. Acad. Med. Sci., Chengdu, China

16:00-16:20 **IL-29**

Critical obstetric hemorrhage: perinatal system problem in Japan and need for blood substitutes

Katsuo Terui

Dept. of Obstetric Anesthesiology, Saitama Medical Center, Saitama Medical University, Kawagoe, Japan

16:20-16:40 **IL-30**

What we learned from the cure of HCV: Road leads to the control of transfusion-transmitted infectious diseases (TTIDs)

Limin Chen^{1,2}

Institute of Blood Transfusion, CAMS& PUMC, Chengdu, China

16:40-16:50 **Break**

Charis: Limin Chen (Inst. of Blood Transfusion, CAMS& PUMC)
Hiroshi Azuma (Asahikawa Medical University)

- 16:50-17:10 **IL-31**
Patient blood management
Lihua Hu
Huazhong Univ. Sci.&Eng., Wuhan, China
- 17:10-17:30 **IL-32**
Medical countermeasure using hemoglobin vesicles against trauma hemorrhagic shock
Manabu Kinoshita
Dept. of Immunology and Microbiology, National Defense Medical College, Tokorozawa, Japan
- 11:10-11:25 **OP-18**
Hemoglobin vesicles prolong the time to circulatory collapse in rats during apnea
Yusuke Naito
Department of Anesthesiology, Nara Medical University, Japan
- 17:45-18:00 **OP-19**
Analysis of adverse reactions of blood transfusion in China
Ling Li
Institute of Blood Transfusion, CAMS& PUMC, Chengdu, China
- 18:00-18:15 **OP-20**
A de novo molecular mechanism of hypertyrosinemia mediated by TTC36-STK33-PEL11 signaling axis
Qin Zhou
College of Laboratory Medicine, Chongqing Medical University, Chongqing, China

Reception Hall

Session 10: Characterization of New HBOCs and Plasma Substitutes

Chairs: Teruyuki Komatsu (Chuo University)
Zhiguo Su (Chinese Academy of Sciences)

- 14:50-15:20 **Keynote Lecture-9**
Hemoglobin modification engineering
Zhiguo Su
Institute of Process Engineering, Chinese Academy of Sciences, Beijing, China
- 15:20-15:40 **IL-33**
Microscopic structural insights into hemoglobin vesicles (HbVs) and closely related polymer and protein solutions
Takaaki Sato
Dept. of Chemistry and Materials, Shinshu University, Ueda, Japan
- 15:40-16:00 **IL-34**
Hemoglobin submicron particles as carriers for oxygen and drugs
Hans Bäuml
Institute of Transfusion Medicine, Charité-Universitätsmedizin Berlin, Berlin, Germany

- 16:00-16:20 **IL-35**
Hemoglobin-albumin cluster “HemoAct™” as red blood cell substitute and O₂ therapeutic reagent
Teruyuki Komatsu
Department of Applied Chemistry, Faculty of Science and Engineering, Chuo University, Tokyo, Japan
- 16:20-16:40 **IL-36**
The study of 300% isovolemic exchange transfusion with polymerized porcine hemoglobin in rats
Kunping Yan
College of Life Sciences, Northwest University, Xi’an, China
- 16:40-16:50 **Break**

Chairs: Hans Bäumlér (Charité-Universitätsmedizin Berlin)
Toru Maruyama (Kumamoto University)
- 16:50-17:10 **IL-37**
Albumin fusion protein: next generation of albumin preparation
Toru Maruyama
Graduate School of Pharmaceutical Sciences, Kumamoto University, Kumamoto, Japan
- 17:10-17:30 **IL-38**
Characterization of hydroxypropyl, acid-thinned waxy tapioca starch based plasma expander
Surapong Chatpun
Inst. of Biomedical Engineering, Faculty of Medicine, Prince of Songkla Univ., Songkla, Thailand
- 17:30-17:45 **OP-21**
The formation of oxygen carrying hemoglobin nanoparticles through desolvation precipitation
Richard Hickey
William G. Lowrie Dept. of Chemical and Biomolecular Engineering, The Ohio State University, Columbus, USA
- 17:45-18:00 **OP-22**
Nanoparticles fully made of hemoglobin and their evaluation as potential oxygen delivery systems
Xiaoli Liu
DTU Health Tech, Technical University of Denmark, Kgs. Lyngby, Denmark
- 18:00-18:15 **OP-23**
Preliminary study on the effect of polymerized human cord hemoglobin on rat myocardial tissue
Jing Wang
Inst. of Blood Transfusion, Chin. Acad. Med. Sci., Chengdu, China
- 18:15-18:45 **Walk to Nara National Museum**
- 19:00-21:00 **“Get Together” (Supper) at “Halftime” in Nara National Museum**

23 November (Saturday)

Morning Program

8:30 **Registration**
Poster-viewing

Noh Theatre

9:00-9:40 **Plenary Lecture-6**

Chair: Chao Chen (Northwest University)

Preclinical perspective on the cardiovascular responses to hemoglobin-based oxygen carriers

Felice D'Agnillo

Center for Biologics Evaluation and Research, Food and Drug Administration, Silver Spring, USA

9:40-9:45 **Break**

Session 11: R&D of HBOCs (from Companies) (1)

Chairs: Manabu Kinoshita (National Defense Medical College)

Amy G. Tsai (Univ. of California, San Diego)

9:45-10:15 **Keynote Lecture-10**

SanFlow for unmet medical needs caused by superoxide toxicity

Carleton J.C. Hsia

AntiRadical Therapeutics LLC, Sioux Falls, USA

10:15-10:35 **IL-39**

First-in-human use of a marine oxygen carrier for organ preservation: a safety and proof-of-principle study

Franck Zal

HEMARINA, Morlaix, France

10:35-10:55 **IL-40**

Hemopure, in the aftermath of HBOC industry's collapse following the 2008 FDA/NIH workshop: What have we learned since then?

Zafiris Zafirelis

Hemoglobin Oxygen Therapeutics LLC, Souderton, USA

10:55-11:15 **IL-41**

VirTech Bio's progress and future plans with a large human hemoglobin polymer

William R. Light

VirTech Bio, Inc., Natick, USA

11:15-11:35 **IL-42**

A different perspective on hemoglobin solutions: The need to move beyond the mis-directed classification of "blood" substitutes

Carl W. Rausch

8-BioMed, Hong Kong

11:35-11:50 **Break**

Reception Hall

Session 12: Applications of Blood Substitutes and Related Technologies

Chairs: Jinhai Shi (China Protein Drug Quality Alliance)
Naoaki Rikihisa (Chiba University)

- 9:45-10:05 **IL-43**
Therapy development for oxygen supply
Jinhai Shi
China Protein Drug Quality Alliance, Tianjin, China
- 10:05-10:20 **OP-24**
Targeted depletion of tumor-associated macrophages by hemoglobin-based nanomedicines for cancer chemo/immunotherapy
Dongfang Zhou
Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, China
- 10:20-10:35 **OP-25**
Tumor vascular status is the determinant of oxygen delivery facilitated by transfused polymerized hemoglobins
Donald Belcher
William G. Lowrie Dept. of Chem. and Biomolecular Engineering, The Ohio State Univ., Columbus, USA
- 10:35-10:50 **OP-26**
Microbiota-host interactions in an *ex vivo* arterially perfused intestinal loop: Searching for neuroactive molecules
Chiko Shimbori
Farncombe Family Digestive Health Research Institute, McMaster University, Hamilton, Canada
- 10:50-11:10 **IL-44**
Artificial red blood cells as potential photosensitizers in laser treatment against red birthmarks
Naoaki Rikihisa
Dept. of Plastic, Reconstructive, and Aesthetic Surgery, Chiba University, Chiba, Japan
- 17:30-17:45 **OP-27**
SanFlow™: a neuroprotective superoxide dismutase/catalase mimetic drug for resuscitation after traumatic brain injury combined with hemorrhage shock for the combat casualty care and global healthcare
Soichiro Seno
Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, USA
- 11:25-11:45 **IL-45**
Study on the mechanism of plasma adsorption (PA) in treating amyotrophic lateral sclerosis (ALS) and potential pathogenesis of ALS
Hequn Zou
The 3rd Affiliated Hospital of Southern Medical University, Guangzhou, China
- 11:45-11:50 **Break**

11:50-12:30 **Presidential Lecture-3**

Chair: Thomas M.S. Chang (McGill University)

The exploration and discussion about the guiding principle of HBOCs research and design

Chengmin Yang

Inst. Blood Transfusion, Chin. Acad. Med. Sci., Chengdu, China

12:30-13:20 **Break / Poster viewing / Lunch**

Afternoon Program

Noh Theatre

Session 13: R&D of HBOCs (from Companies) (2)

Chairs: Thomas M.S. Chang (McGill University)
Koichi Kobayashi (Keio University)

13:20-13:40 **IL-46**

ErythroMer: bio-inspired design & performance data for nanofabricated artificial RBCs

Allan Doctor

KaloCyte, University of Maryland, Baltimore, USA

13:40-14:00 **IL-47**

Mitered oxygen delivery and transport to prevent ischemia and reperfusion injury of the heart

Olga Bockeria

Medical Technology Associates (MTA) II, USA

14:00-14:20 **IL-48**

From a different angle: How to make hemoglobin based oxygen carrier (HBOC) work for human application.

Bing Lou Wong

Advisor and Adjunct Professor, Inst. of Blood Transfusion, Chin. Acad. Med. Sci., Chengdu, China

14:20-14:35 **OP-28**

Toward understanding the impact of hemoglobin-based oxygen carriers on erythropoiesis

Jan Simoni

Texas HemoBioTherapeutics & BioInnovation Center, Lubbock, USA

14:35-14:50 **OP-29**

Challenges and opportunities in product development – Act-O₂-Hem a story of ups and downs

Maria Seriakov

M bioserviceS GmbH, Linz, Austria

Reception Hall

Session 14: New Applications of HBOCs

Chairs: Naoto Matsuno (Asahikawa Medical University)
Leticia Hosta-Rigau (Technical University of Denmark)

13:20-13:40 **IL-49**

Present status of transplant organ preservation by dynamic machine perfusion system: How important is the development of a novel organ preservation solution?

Naoto Matsuno

Asahikawa Medical University, Asahikawa, Japan

13:40-14:00 **IL-50**

Normothermic preservation of the rat hind limb with artificial oxygen-carrying hemoglobin vesicles and the possibility of therapeutic application

Jun Araki

Division of Plastic and Reconstructive Surgery, Shizuoka Cancer Center Hospital, Shizuoka, Japan

14:00-14:15 **OP-30**

Hemoglobin-based oxygen carrier with antioxidant properties towards hypoxia treatment

Michelle M. T. Jansman

Centre for Nanomedicine and Theranostics, Technical University of Denmark, Lyngby, Denmark

14:15-14:30 **OP-31**

Polymerized human placenta hemoglobin attenuates severe burns-induced myocardial and vascular damage

Tao Li

Laboratory of Anesthesiology and Translational Neuroscience Center, West China Hospital, Chengdu, China

14:30-14:45 **OP-32**

The efficacy of hemoglobin vesicles (HbV) containing solution in machine perfusion in donation after cardiac death (DCD) in pig liver model

Tatsuya Shonaka

Department of Surgery, Asahikawa Medical University, Asahikawa, Japan

Noh Theatre

14:50- **Closing Ceremony**

Awards Announcement

Closing Remarks

Next ISBS-2021 (Europe) Announcement

Poster Presentations

in order of submission

- P-1 Effects of stem cell collection and cryopreservation at -80°C on the count and activity of CD34⁺ cells and mononuclear cells**
Zimin Lu
 Department of Blood Transfusion Affiliated Tongji Hospital, Shanghai Tongji University, Shanghai, China
- P-2 Metal-Organic Framework-Hemoglobin Conjugates for Oxygen Carriers**
Zhigang Xie
 Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, China
- P-3 Properties of oxygen carrier Acto₂Hem® particles fabricated by CCD technique**
Yu Xiong
 Biophyll GmbH, Germany; Inst. of Transfusion Medicine, Charité-Universitätsmedizin Berlin, Berlin, Germany
- P-4 Synthesis of the hemoglobin-conjugated polymer micelles by thiol Michael addition reaction**
Yanxin Qi
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