

Selenium Research

International Society for Selenium Research

Issue 12, 2025

President's Remarks



Dear fellow researchers, dedicated scientists and friends of Selenium!

The year 2025 is ending. It was again an interesting year for us and for selenium research. It was a real pleasure, a great honor and an exciting and rewarding task to participate in our perfectly organized 8th International Conference on Selenium in the Environment and Human Health, on July 6-9, 2025, in Chuzhou, China. Many thanks to our local host and team around Professor Dr. Xuebin Yin, and the most charming and active supporters and young student volunteers who ensured that the conference ran smoothly. Their assistance removed all obstacles and made everyone welcome, safe and comfortable. It was a memorable and enriching experience in an exciting, supportive, and highly creative atmosphere. Among the many highlights were numerous informative talks both by young and established scientists, great and fascinating posters, relaxing and joyful common events like the Gala dinner, excursions, and the memorable closing session with its many well-deserved prizes. For the first time in the history of the *International Society for Selenium Research* (ISSR), the highest honors that our society has to offer, the Silver Award of the ISSR (named after brightest moon light) and a Certificate of Appreciation, was handed over to three funding members well known to all of us, who have skillfully and successfully steered our society's ship through calm and stormy weather with the utmost professional competence, empathy, including the necessary sense of humor. Congratulations once again, and thank you Drs Gary S. Bañuelos, Zhi-Qing (ZQ) Lin, and Xuebin

Yin for your indispensable service to us all and your commitment to our common goal.

There is no doubt that face-to-face conferences cannot be replaced by online meetings. Just think of the expectant, exciting preparations, the journey to meeting old friends again and getting to know newcomers to the selenium field, experiencing the thrilling activities before a session, observing the smiles on each other's faces, listening to the latest scientific findings, developing far-reaching concepts over a drink or two, and enjoying non-verbal communication in gestures, nods, raised eyebrows, elegant movements and grace in speech and behavior. No matter how long the journey, how exhausting the trip, and how many bureaucratic hurdles and visa problems there are to overcome – it's worth it. We will try again to find our ways to the next conference venue in Italy to meet our colleagues again in 2027. At such events, time always passes far too quickly, many discussions end too soon, and the good friends leave too early. I have always wished that such wonderful events would last forever, at least for a longer time, but unfortunately you leave just when it is at its best – as in an old proverb, where this recurring fact and fundamental truth is mourned and lamented.

In addition to reflecting on the convivial, inspiring and relaxed nature of our conference, the science surrounding our favorite element continues to yield



most exciting results. Once again, the progress made in fortified foods was astonishing, and new insights into climate impacts, agricultural improvements for plant and animal health and food production, and novel model systems and research concepts were very fascinating [1]. As someone who works in a medical hospital, I was once again impressed by the ever-improving understanding of selenoproteins for various aspects of human health, with the cell death pathway of ferroptosis increasingly establishing itself as a key and central aspect of the pathophysiology surrounding selenium deficiency. Ferroptosis explains cell loss, disease risk and degenerative processes in old age, but it also opens new therapeutic options for the treatment and selective control of novel therapeutic measures for diseases. It is therefore not surprising that the most renowned journals are reporting on innovations in the field of selenoproteins and ferroptosis in their recent issues, from the basic principles to the prospects for therapeutic use in cancer treatment [2]. Overall, the

concept of avoiding selenium deficiency to maintain robust health, manage disease risks, and slow down the ageing process, has gained further support. Two examples from clinical studies in humans, in which the transporter SELENOP was used as a biomarker for intake and status because it is readily available from serum or plasma, illustrate this development particularly impressively. In a hypothesis-free systematic comparison of all detectable plasma proteins (n = 2920), SELENOP was found to vary most strongly among vegans, vegetarians, and omnivores when comparing plasma samples from the UK Biobank, i.e. it reliably reflects the increased requirements of vegetarians in central Asia, Africa and Europe, as their agricultural soils do not provide sufficient selenium for a balanced nutritional supply via crop consumption (Fig. 1A) [3].

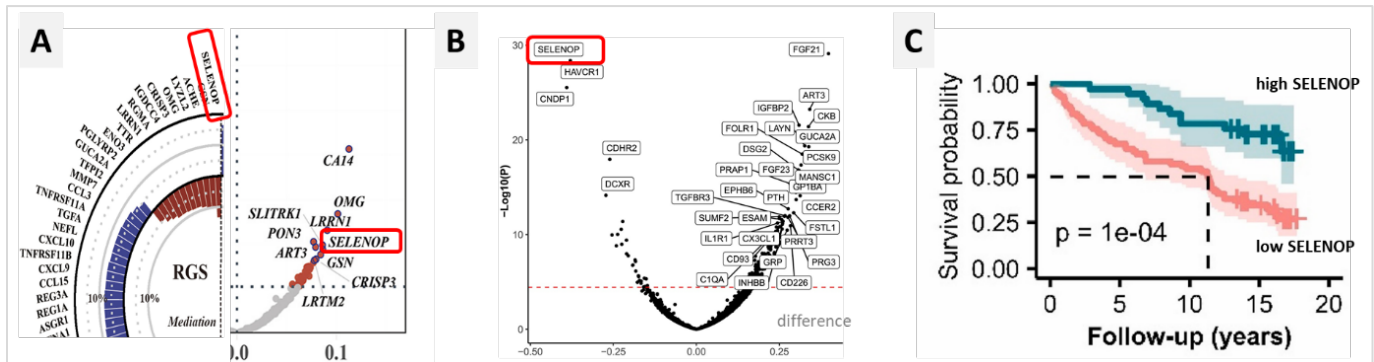


Figure 1. Novel insights into the role of Se supply and selenoprotein P (SELENOP) for human health. A: A systematic unbiased analysis of plasma proteins from participants of the UK biobank indicated the strongest interaction between SELENOP levels with healthy aging and relative grip strength (RGS). B: The comparison of the plasma proteomes of vegans, vegetarians and omnivores highlighted circulating SELENOP as being most different between the groups with these diverse nutritional patterns. C: Strong association of increased mortality of colorectal cancer patients when displaying SELENOP deficiency in comparison to higher SELENOP levels in a prospective analysis of survival of elderly Austrian patients. (Figure is composed and modified from previous studies [3-5]).

In an independent analysis, the same database was also used to identify the proteins with highest relevance for healthy living and maintaining good grip strength as a measure of metabolic and physical fitness. Again, SELENOP turned out to be probably the strongest positive predictor of disease-free ageing, quality of life and healthy longevity (Fig. 1B) [4]. These research findings thereby support our society's overarching goal of improving selenium intake by optimizing our soil quality and the agricultural processes and, if necessary, proposing and providing supplementary measures to enable safe and improved selenium intake, and thereby, also optimized selenoprotein biosynthesis and action. However, oversupply needs to be avoided, but the risks of selenium deficiency, as seen in chronic diseases in

populations living in areas with low selenium availability in the soil, or in people with restricted dietary habits, must be recognized as an important health issue by the public. This problem represents a treatable and preventable disease risk that can be reliably identified and corrected. The severe effects of chronic deficiency were once again impressively underlined when we compared survival of elderly patients with an incidental diagnosis of colorectal cancer (Fig. 1C). The analysis of participants of a colorectal cancer screening program in Austria enabled a discrimination into three groups upon conducting colonoscopy of potentially affected individuals: those without tumors, those with adenomas, and those with colorectal cancer. When the subjects were divided

according to the median SELENOP concentration, those with a deficiency had a significantly increased risk of mortality over the next 17 years, regardless of whether they had a disease or not, both with and without cancer [5]. These findings also underpin the main theme of our ISSR: promoting awareness of this preventable health risk through targeted research on selenium, from its cycling in the atmosphere through soil, plants and animals to humans, where selenium status proves relevant for survival. Importantly, educating the public and, where possible, convincing key decision-makers in nutrition policy is vitally important.

While most of us have pursued this line of research on the trace element selenium through chance, reasoning, logical-thinking, listening, reading, reflecting and experimental testing, the largest epidemiological studies now prove that even those who did not come across and appreciate our goddess Selene from the outset, will need to reconsider and acknowledge her importance, as she shines brightly through these recent impressive results in selenium research. Her presence reminds every one of her fundamental relevance and power to control ageing, health, and to provide light and hope even in the darkest nights. Let us be inspired and encouraged by her faint but steady light of consistency and reliability. Moreover, let us be supported and motivated by our fellow members of our society. In the ISSR you never walk alone, you will walk on through storm, wind and rain to a golden sky (*courtesy of Rodgers and Hammerstein, 1945; the full text of this concept can be found on the homepage of the British football club Liverpool FC*). And just like in football, every season comes to an end sooner or later, and new players and managers are signed. This cycle also applies to our society, and we are looking forward to the election of a new team of president and vice-presidents in the next year and will support them to the fullest to keep the ISSR on track.

With these uplifting, empowering and inspiring thoughts, we wish you all a wonderful, peaceful and convivial Christmas season, a great celebration and a healthy and happy start into 2026. All best from the three of us, residing in Berlin, Ghent, and Chuzhou, warmest greetings, yours sincerely,

Lutz Schomburg, President (Germany)
Gijs Du Laing, Vice President (Belgium)
Xuebin Yin, Vice President (China)

REFERENCES

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The 8th International Conference on Selenium in the Environment and Human Health has been successfully held in Chuzhou, Anhui, China on July 6-9, 2025

The 8th International Conference on Selenium in the Environment and Human Health has successfully been held on July 6-9, 2025, at the Sheraton Hotel in Chuzhou, Anhui, China. The conference was co-organized by Anhui University of Science and Technology in Chuzhou, China and International Society for Selenium Research.



The conference convened under the theme "Selenium for a Healthy World." It attracted over 260 participants from more than 10 countries, including Germany, the United States, France, Sweden, Italy, Belgium, Thailand, Brazil, and China.

The conference focused on 12 topics including the origin and distribution of selenium, its metabolic mechanisms in plants, and its effects on human health. A total of 100 academic abstracts were accepted, featuring 24 poster presentations, 42 authoritative expert presentations, and 12 student oral presentations.

A dedicated exhibition session on selenium-enriched industry was also organized along with the research presentations, where numerous enterprises showcased their latest products and technological achievements.

The successful conclusion of this conference has not only strengthened communication and cooperation among global selenium researchers but also made significant contributions to addressing global health challenge of "hidden hunger" through selenium science.

The conference was featured with two keynote speeches: Autoimmunity to Its Transporter Offers Novel Insights into the Physiological Role of Selenium by Lutz Schomburg at Charité Universitätsmedizin Berlin, Germany; Selenium Biofortification: Strategies, Progress and Challenges by Xuebin Yin at Anhui Science and Technology University. Accepted abstracts were peer-reviewed and published in the Proceedings of 8th International Conference on Selenium in the Environment and Human Health. The proceedings are open access at the society website: <http://www.seleniumresearch.pro/publication/conference-proceedings/>.

(Xuebin Yin & Jiaping Song, Anhui Science and Technology University)

Student Awards at the 8th International Conference on Selenium in the Environment and Human Health

There were 12 oral and 24 poster presentations by student selenium researchers in the Student Session at the 8th International Conference on Selenium in the Environment and Human Health. Three students have been selected to receive the Best Student Oral Presentation Awards and three for the Best Student Poster Presentation Awards:

Jeroen van der Woude at Wageningen University was awarded the Best Student Oral Presentation Award. His oral presentation: *An Atlas of Plant Selenium Metabolism: A Model to Help Interpret Modern-omics Data in Selenium Research*.

Zheng Lei at Huazhong Agricultural University received the Best Student Oral Presentation Award for his presentation entitled *Dynamic and Stable Core Microbiota Assist Plants in Enriching Selenium and Reducing Cadmium Absorption*.

Maria Lanza at São Paulo State University was honored with the Best Student Oral Presentation Award

for her presentation entitled *Enhancing Food Security: Advances in Plant Nutrition with Selenium*.



Yidan Wang at Xi'an Jiaotong-Liverpool University won the Best Student Poster Presentation Award for her presentation entitled *Screening, Identification, and Evaluation of Selenium- and Zinc-Enriched Probiotic Strains*.

Yi Liu at China Agricultural University received the Best Student Poster Presentation Award for her presentation entitled *Bioreduction and Volatilization of Selenium by *Delftia acidovorans* R25*.

Jeroen van der Woude at Wageningen University also received the Best Student Poster Presentation Award.



The Student Session was coordinated by Professor Linxi Yuan at Xi'an Jiaotong-Liverpool University. The award judges were Professor David Churchill at Korea Advanced Institute of Science and Technology, Professor Miao Li at Anhui Agricultural University, Professor Yu Tao at China University of Geosciences, Professor Andre dos Reis at São Paulo State University, Professor Xiaohu Zhao at Huazhong Agricultural University, and Professor Michela Schiavon at University of Turin.

Congratulations to all award winners!

(Jiaping Song at Anhui Science and Technology University & Linxi Yuan at Xi'an Jiaotong-Liverpool University)



News from the Society

The China Youth Branch

The members of China Youth Branch have made significant progress on selenium research in the following publications:

Selenium biogeochemical cycling:

Wen, Q. et al. 2025. Chemical elements and human health from the perspective of “One Health”. *China Geology*, 8(3), 607-627.

Zhang, R. et al. 2025. The silent shift: Investigating selenium biovolatilization in natural environments. *Reviews of Geophysics*, 63, e2024RG000856.

These research findings provide a systematic framework and theoretical basis for GeoHealth research by integrating geological, environmental, ecological, and health-related factors, thereby supporting the development of a health-oriented evaluation system for the Earth system.

Selenium biofortification:

Farooq, M.R. et al. 2025. Effective agronomic biofortification of rice with selenium: Ensuring dietary intake through relative bioavailability and bioaccessible fractions. *Food Research International*, 221(2), 117361.

A study highlights organic Se fertilizers as safe and effective for rice biofortification, emphasizing the need to integrate total Se, bioaccessible Se, and relative bioavailability into dietary intake standards for precise nutritional assessments.

Ye, G. et al. 2025. Assessing the robustness and generalizability of machine learning models for predicting selenium content in rice: a case study from the Pearl River Delta and Eastern Guangdong, China. *Environmental Geochemistry and Health*, 47(9), 382.

Zhang, L. et al. 2025. Using machine learning to predict selenium content in crops: Implications for soil health and agricultural land utilization in longevity regions. *Science of the Total Environment*, 964, 178520.

These studies explored the Artificial Neural Network (ANN) as the best performance in predicting Se levels in crops at regional scale and providing important guidance for optimizing the cultivation of Se-enriched crops.

Mkumbwa, H. et al. 2025. Identification and functional characterization of OsSULTR3;1 in grain Se accumulation in rice. *Journal of Agricultural and Food Chemistry*, 73, 19273-19287.

The study validated the function of OsSULTR3;1 in rice grain Se accumulation and provided information for breeding Se-enriched rice cultivars.

Lei, Z. et al. 2025. Sultr1;2-mediated recruitment of selenium-oxidizing bacteria promotes plant selenium uptake. *Journal of Agricultural and Food Chemistry*, 73 (22), 13313-13326.

This study discovered that root exudates from Sultr1;2 overexpressing tomatoes were rich in metabolites from the arginine and proline metabolic pathways, which significantly promoted the growth of methylobacterium and enhanced Se accumulation in tomato.

Zhang, H. et al. 2025. Metabolism interaction between *Bacillus cereus* SESY and *Brassica napus* contributes to enhance host selenium absorption and accumulation. *Plant Cell and Environment*, 48 (3), 2200-2220.

Zhang, H. et al. 2025. Root-exuded metabolites recruit selenium-transforming microbiota to enhance plant Se acquisition. *Plant Cell and Environment*, doi: 10.1111/pce.70307.

B. cereus SESY notably altered the composition of root exudates, specifically recruiting functional microbiota with high motility, and promoted the high-level expression of Se metabolism-related genes in the microbiota, and thus, facilitating the conversion of insoluble Se to bioavailable forms in the rhizosphere soil.

Selenium interaction with other elements:

Kong, L. et al. 2025. Interactions between zinc and selenium with foliar spraying and their effects on cadmium accumulation in wheat grains. *Plant and Soil*, doi:10.1007/s11104-025-07655-5.

Co-application of Zn and Se increased wheat grain Cd, enhanced the conversion of Se(VI) to MeSeCys in leaves and inhibited Se translocation, lowering Se content in other tissues.

Zhang, Z. et al. 2025. Bioavailability, accumulation, translocation and transformation of Cd depend on the molar ratio of soil-Se-to-Cd: Evidence from a natural Se-Cd rich soil-corn system. *Science of the Total Environment*, 1004, 180758.

In the soil-corn system from a natural Se-Cd rich area, the soil Se:Cd molar ratio primarily regulates Cd accumulation at the soil-root interface, with limited impact on subsequent

translocation within plant compartments. Moreover, the transformation of Cd into Cd-SeCys and Cd-SeMet occurred more frequently in the stem and leaf compared with that in the root.

Lei, Z. et al. 2025. Dynamic and stable core microbiota assist plants in enriching selenium and reducing cadmium absorption. *Advanced Science*, doi:10.1002/advs.202500862.

The results indicated that the synthetic microbial community, combined with key amino acids from the glutathione metabolism, could stably increase the bioavailable Se content in the soil and significantly reduce the Cd concentration, thereby achieving the Se biofortification and Cd reduction effects in plants.

Zhang, H. et al. 2025. DL-alanine promotes the colonization of *Pseudomonas aeruginosa* and their synergistic enrichment of selenium and decrease of cadmium absorption by *Brassica napus*. *J Hazard Mater*, 492. doi:10.1016/j.jhazmat.2025.138154.

In Se-Cd co-contaminated soils, the addition of DL-alanine significantly enriched the rhizosphere microbiota of Pseudomonas aeruginosa, upregulated the expression of Se-related genes in Brassica napus but also suppressed the expression of Cd transport genes to reduce Cd accumulation in plant.

Wang, C. et al. 2025. Nanotechnology-driven coordination of shoot-root systems enhances rice nitrogen use efficiency. *PNAS*, 122, e2508456122.

The foliar application of nano-Se fertilizer enhanced nitrogen use efficiency and reduced greenhouse gas emission in paddy field, offering a viable strategy for balancing food production needs with ecological preservation objectives in the context of global climate change.

Zhang, Z.H. et al. 2025. Selenium regulated the responses of soil bacterial communities to short-term elevated atmospheric CO₂ stress. *Environmental Research*, 285, 122665.

Elevated CO₂ levels and Se addition significantly affected soil physicochemical properties, which in turn influenced soil bacterial α -diversity and functional genes related to the nitrogen cycle, carbon and sulfur cycles.

Selenium for plant protection:

Wang, P. et al. 2025. Integrated transcriptomic and metabolomic analyses reveal key mechanisms of selenium and melatonin in enhancing tea plant resistance to gray blight disease. *Horticultural Plant J*, doi:10.1016/j.hpj.2025.09.002.

The combined Se and melatonin treatment reprograms plant immunity by modulating MAPK signaling and enhancing protective secondary metabolites, offering an environmentally friendly strategy to manage tea gray blight and develop Se-enriched or melatonin-biofortified tea products.

Cheng, Q. et al. 2025. The toxicant for pathogen and pest but the guardian of soil and crop. *Journal of Agricultural and Food Chemistry*, 73(19), 11495-11514.

A comprehensive review article reviewed research progress on Se's role in pest and disease control, proposing future research directions with the aim of integrating Se more effectively into sustainable agricultural practices.

Selenium on human health:

Kou, L. et al. 2025. Exploring the impact of selenium supplementation on nutritional, inflammatory, and cardiac function in chronic heart failure patients: A novel approach to managing deficiency. *Cardiovasc Toxicol*, 25, 1523-1533.

These findings indicate that the combination of hypertension and low selenium may exacerbate cardiac dysfunction, while controlled selenium supplementation intervention is expected to improve the clinical outcomes of CHF patients, providing important references for the formulation of personalized clinical nutritional treatment plans.

Chen, R. et al. 2025. The methylation of TXNRD2 with chronic heart failure: the interaction effect between methylation regulation and clinical parameters - a single center pilot study. *BMC Cardiovasc Disord*, 25, 622.

Zhao, R. et al. 2025. The bidirectional regulatory effect of TXNRD2 methylation in patients with chronic heart failure and its nonlinear dose-response relationship with key clinical parameters. *J Cardiothorac Surg*, 20, 260.

These studies suggest that TXNRD2 promoter methylation has the potential to serve as a diagnostic biomarker for CHF and may influence the onset and progression of CHF by modulating pathways related to liver and kidney function and coagulation, offering new perspectives for the development of personalized clinical treatment strategies.

Li, F. et al. 2025. Selenium status associates with thyroid hormone and thyroid dysfunction in older Chinese adults. *Biological Trace Element Research*, 203, 1413-1421.

A study reveals that higher Se levels were significantly associated with lower TSH levels and higher levels of TT3,

FT3 and FT4. Meanwhile, higher Se levels were associated with lower risk of hypothyroidism and higher risk of hyperthyroidism.

Wang, X. et al. 2025. Gut microbiota: a new perspective for bioavailability of selenium and human health. *npj Science of Food*, 9, 228.

This review provides a comprehensive summary of selenium metabolism and bioavailability, along with the relationship between selenium, gut microbiota and some diseases.

(Linxi Yuan, President of China Youth Branch, Senior Associate Professor at Xi'an Jiaotong-Liverpool University)



The 9th International Conference on Selenium in the Environment and Human Health will be held in Turin (Torino), Italy in 2027

The 9th International Selenium Conference 2027 will be held in the beautiful and historic city of Turin (Torino), Italy. The conference will be led by Dr. Michela Schiavon and her team of the University of Turin, with the support of a dedicated organizing committee involving Drs. Gary Banuelos at USDA-ARS, Lutz Schomburg at Charité Universitätsmedizin Berlin, Gijb Du Laing at Ghent University, and Zhi-Qing Lin at Southern Illinois University - Edwardsville.

The 2027 conference promises a stimulating program, high-quality scientific sessions, and memorable cultural experiences. It will bring together experts from around the world to discuss advances in selenium biology, human nutrition, plant science, environmental chemistry, and global health. The conference will offer a dynamic platform for presenting new findings, promoting dialogue, and strengthening international networks.

Turin is a city of innovation and history. Nestled at the foot of the Alps and crossed by the Po River, Turin is one of Italy's most beautiful cities, renowned for its refined architecture, rich cultural heritage, and vibrant scientific community. Once the first capital of unified Italy, Turin hosts grand boulevards, baroque palaces, several royal buildings, world-class museums, theatres, lively cafés, and elegant squares. Visitors can immerse

themselves in the city's remarkable offerings: The Mole Antonelliana, Turin's iconic tower, hosting the National Museum of Cinema. The Egyptian Museum, one of the most important collections of Egyptian antiquities outside Cairo. The Royal Palace and the Residences of the Savoy Dynasty, UNESCO World Heritage Sites. Parco del Valentino, a green oasis along the river, perfect for walks and informal discussions. A celebrated culinary tradition, from chocolate and gianduja to typical Piedmont's wines and truffles.

Turin is also a city of science and innovation, with renowned universities and research institutions, making it an inspiring environment for hosting an international scientific meeting. More information on dates, venue, registration, and scientific program will become available soon. We look forward to welcoming you to Turin for an unforgettable selenium conference!



(Michela Schiavon, Associate Professor at University of Turin;
michela.schiavon@unito.it)

13th International Symposium on Selenium in Biology and Medicine (ISSBM 13) was held on October 26-29, 2025, at The Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea



The 13th International Symposium on Selenium in Biology and Medicine (ISSBM 13) took place as advertised (<https://issbm.org/>) as “An inclusive and youthful researcher-driven event” in Daejeon South Korea with approximately 200 in-person attendees from roughly 14 different countries.

The 100+ oral presentations during ISSBM 13 spanned a range of scientific fields including biological and medical fields, as well as chemistry. There were about 45 poster presentations as well. The 4-day event started on Sunday, October 26th and was held in the Academic Complex (Building E9) at the KAIST main campus in Daejeon. Professor David G. Churchill, a longstanding member of the Department of Chemistry at KAIST, was the main conference organizer and Chairman of ISSBM 13.

The opening day invitation speeches by Professor Gyun-Min Lee (Vice President of KAIST) and Professor Hyunjoon Song (Chairman, Department of Chemistry) were well received. Chairman Song urged the conference name (and acronym) in the future to include the term “Chemistry.” The conference highly appreciated presence of two plenary speakers, Professors Marcus Conrad and Vadim Gladyshev. There were approximately 30 different keynote lecturers as well adorning the scientific sessions. Many sections of the day involved three parallel sessions.

Recognition for Best Oral and Poster Presentations:

Senior Professor/Chemical Science Best Trainee Award: Professor Lutz Schomburg (Charite - Universitätsmedizin Berlin).

Mid-Career Professor/Chemical Communications Runner Up Best Trainee Award: Professor Marco Mariotti (Universitat de Barcelona).

Junior Professor/Dalton Transactions Second Runner Up Best Trainee Award: Gholamreza Gholamreza Fazeli (University of Wuerzburg).

RSC Pharmaceuticals Best Trainee Poster Awards: Princess Jena Santiago (University of Hawai'i at Mānoa) and Pauline Béziat (ETH).

RSC Medicinal Chemistry Best Trainee Poster Awards: Ihyeon Ahn (Dankook University) and Jumi Lee (Dankook University).

Main Group Chemistry (SAGE) Best Poster Prize (Organized by David Churchill): Dr. Priya Kulshrestha (KAIST), Minkyung Jung (Tohoku University), Rumi Mikami (Tokai University), Satoru Shiina (Tohoku University), and Qing Chen (Karolinska Institutet).

Springer–Nature Sponsored Best Poster Awards (organized by Wen–Hsing Cheng): Max Ticó Miñarro (Universitat de Barcelona), Christine Lau & Marie Ishida (University of Hawai'i at Mānoa), Inhwon Yoo (Dankook University), Anastasia Levkina (Helmholtz Zentrum München GmbH), Anna Ochi (Ritsumeikan University), and Pató Zsuzsanna (NIO-National Institute of Oncology, Budapest).

ISSBM 13 was very well supported financially by KAIST through the special funding allotted by KAI-X (Special thanks to AhYun Lim) and the International Cooperation Funding (Department of Chemistry & International Relations Team). The financial sponsors of ISSBM 13 include the Chinese company Guomin Health and the Daejeon Tourism Bureau. Abundant thanks should be made to Professor Namgyu Lee at Dankook University for her tremendous support energy coordinating the manpower/womanpower aspects and providing ideas; Miss Ihyeon Ahn at Dankook University also served as the conference secretary. Professor Elias Arnér is gratefully acknowledged for his extensive help in planning and critiquing the emerging website etc. Professors Lutz Schomburg and Peter Hoffmann were also very willing and capable of giving excellent input. We thank Professors Sharon Rozovsky and Christopher Williams and An-Sik Chung. We are all sincerely in appreciation of the steady and consistent assistance provide by the student volunteers, adorned in conference “blue shirts.” The webmaster Matthew Bahng did his best to respond to continual requests leading up to ISSBM 13.



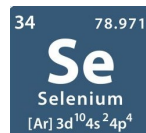
The regional excursion for the conference involved 2 tour buses that toured several sites in Gongju (not Gyeongju). An easy hike around the palace (Gongsanseong Fortress) and then to the Gongju National Museum and adjoining Traditional Village allowed for gentle touring, further networking, and photographic times. Dinner was then enjoyed en masse at the Kyung Ha Spa Hotel (Yuseong Spa Area of Daejeon).

Satellite Meeting in Japan: ISSBM 13 also featured a satellite meeting in Sendai, Japan directly after the Daejeon meeting, entitled “Joint Meeting of the 8th Japanese Selenium Research Society and the 13th International Symposium on Selenium in Biology and Medicine (Se2025)”. This event took place on October

31 to November 2, 2025, at Tohoku University (Seiryō Campus).

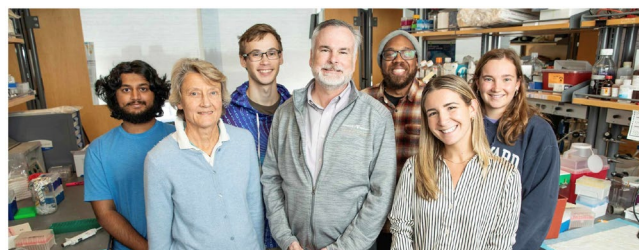
ISSBM 14 in Perugia, Italy: On the final day in Daejeon, all participants in the main lecture hall were able to vote for the location of ISSBM 14, following the respective presentations made by Professors G. Mugesh (Bangalore, India) and C. Santi (Perugia, Italy). The decision was that ISSBM 14 will be held in Perugia, Italy, chaired by Professor Claudio Santi with approximate dates being September-October 2028.

(David Churchill, The Korea Advanced Institute of Science & Technology)



Selenium Research Highlights

Selenium Research in the Department of Medicine at Vanderbilt University, USA



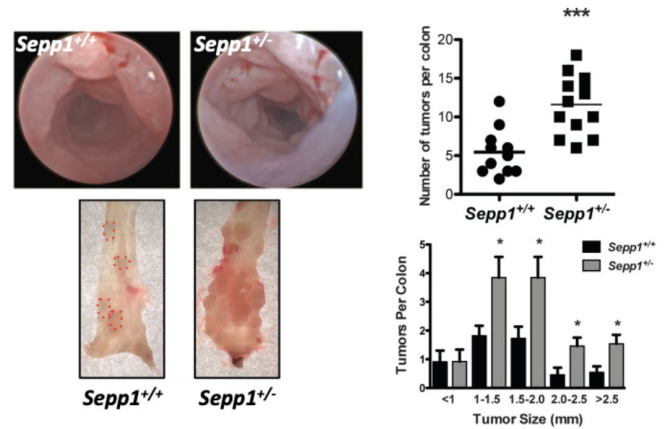
Members of the Williams Lab in their research space at Vanderbilt University. The team's multidisciplinary expertise - spanning epithelial biology, redox biochemistry, cancer genetics, and translational gastroenterology - supports rigorous investigations that bridge basic mechanisms with clinical relevance.

The Williams Lab at Vanderbilt University investigates the mechanisms governing intestinal epithelial repair and how these processes become dysregulated in inflammatory bowel disease (IBD) and colitis-associated carcinoma (CAC). The research program integrates basic discovery with translational investigation across three core areas: (i) epigenetic control of epithelial wound-healing programs and their relationship to colorectal oncogenesis; (ii) junctional signaling in mucosal repair and inflammatory carcinogenesis; and (iii) oxidative injury defenses in IBD and CAC.

Current Emphasis - Oxidative Injury Defenses in IBD and CAC: IBD is marked by recurrent mucosal injury accompanied by pronounced oxidative stress. The Williams Lab focuses on selenium-dependent antioxidant pathways as key modulators of reactive oxygen species (ROS) in the intestinal microenvironment. Prior work from the lab demonstrates that selenium deficiency exacerbates mucosal injury and accelerates colitis-associated dysplasia (CAD). Complementary genetic studies using germline *Selenop* and *Gpx3* mutant mice reveal increased tumor burden accompanied by shifts in epithelial behavior - including enhanced proliferation, impaired apoptosis, and heightened DNA damage. These findings support a model in which selenium-dependent redox control shapes inflammatory tone and preserves genomic integrity during epithelial repair.

SELENOP Discoveries in the Gut: The Williams Lab has uncovered novel roles for SELENOP in intestinal biology that extend beyond its canonical function as a selenium transport protein. Using genetic mouse models, the lab demonstrated that SELENOP deficiency significantly increases susceptibility to colitis-associated cancer, with *Selenop*^{-/-} mice displaying elevated tumor burden, larger lesion sizes, and accelerated progression from dysplasia to carcinoma. Mechanistic investigations reveal that loss of SELENOP results in heightened oxidative stress, altered inflammatory signaling, and disrupted epithelial homeostasis during injury and repair. Importantly, these studies have identified SELENOP expression in multiple intestinal compartments - including the epithelium itself - suggesting local roles in maintaining mucosal redox balance. The lab has further demonstrated that SELENOP influences key cellular processes governing stem cell dynamics, proliferation control, and genomic stability, positioning it as a critical modulator of the intestinal response to inflammatory injury.

Working Model and Ongoing Investigations: The lab hypothesizes that intestinal SELENOP serves multiple interconnected roles that collectively influence mucosal homeostasis and injury responses. First, it serves its classical role as a selenium transport protein, delivering selenium to the gut to support the function of other selenoproteins with antioxidant and regulatory activities. Second, SELENOP may function to recycle selenium prior to intestinal epithelial cell sloughing into the lumen, thereby preserving this essential micronutrient. Third, emerging evidence



Selenop deficiency increases tumor burden in colitis-associated cancer. Representative endoscopic and gross images contrast *Selenop*^{+/+} and *Selenop*^{-/-} colons, showing visibly increased lesion numbers in *Selenop*^{-/-} animals. Quantitative analyses demonstrate more tumors per colon and a size distribution skewed toward larger lesions in *Selenop*^{-/-} mice, consistent with augmented proliferation, diminished apoptosis, and greater DNA damage resulting from impaired selenium-dependent antioxidant defense.

suggests SELENOP may directly modulate WNT signaling, thereby affecting intestinal stem cell programs that govern proliferation, differentiation, and tissue regeneration. Through these mechanisms - individually or in combination - SELENOP mitigates ROS in the mucosa, modulates the cytokine milieu and immune-epithelial signaling, and influences stem cell fate decisions under inflammatory conditions.

Current efforts focus on delineating which stem cell pathways are affected by selenoproteins under colitis conditions, with particular attention to canonical and noncanonical WNT signaling, lineage commitment, DNA damage responses, and cell survival. These studies aim to identify redox-sensitive regulatory nodes that determine whether injury responses lead to regeneration or progress toward maladaptive remodeling and neoplasia. The lab's working hypothesis is that SELENOP's effects on epithelial biology and carcinogenesis result from the integrated contribution of its selenium transport, recycling, and signaling functions.

Translational Trajectory: By defining how selenium-dependent systems calibrate epithelial repair under inflammatory stress, the Williams Lab seeks to develop biomarkers for oxidative injury risk and therapeutic strategies that reinforce endogenous antioxidant defenses. The overarching objective is to stabilize repair programs, reduce colitis-associated neoplasia,

and improve long-term outcomes for individuals living with IBD.



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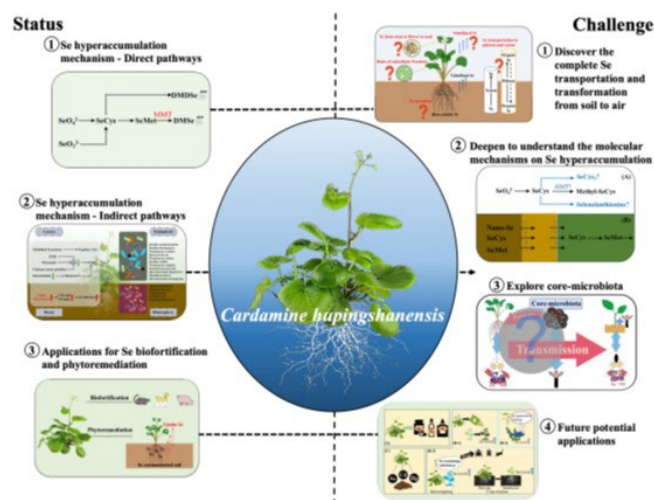
outlines future research directions - highlighting the potential of multi-omics approaches, investigations into rhizosphere microbiota, and practical applications in Se biofortification and phytoremediation. By consolidating current knowledge and guiding future inquiry, this review aims to elevate *Cardamine hupingshanensis* to the forefront of international Se research and attract more scholars to explore this unique hyperaccumulator.

Full article: <https://doi.org/10.1093/aob/mcaf245>.

(Linxi Yuan, Xi'an Jiaotong-Liverpool University)



The Mechanism and Application of Selenium Hyperaccumulator *Cardamine hupingshanensis*: Status and Challenges



A comprehensive review article on Chinese Se hyperaccumulator *Cardamine hupingshanensis* has been recently published in Annals of Botany by Dr. Linxi Yuan and his colleagues. This article systematically synthesizes the existing body of research on the Se hyperaccumulation mechanisms of *Cardamine hupingshanensis* since 2013. Key topics covered include core genes (e.g. Homocysteine S-methyltransferase, Methionine S-methyltransferase), structural adaptations, oxidative stress responses, and plant-microbiome interactions. Furthermore, the review identifies critical unresolved questions and

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Membership is open to all who are interested in fostering the expansion of communication and scientific exchange of new and emerging concepts centered within the multi-disciplines associated with current and future worldwide selenium research efforts. The membership will include regular, student and honorary members. A regular member has the right to elect, or to be elected, as an officer of the ISSR. To join the ISSR, individuals will need to complete the membership application form. The membership due for a regular member is \$50 (USD) for a two-year membership, and \$20 (USD) for a student member. For a lifelong membership the membership due is \$300 (USD).

The membership due of \$50 (for a regular member for two years), \$20 (for a student member for two years), or \$300 (for lifelong membership) can be paid via the following approaches: (1) The payment can be made in cash at the selenium conference; (2) The fund can be transferred through Western Union or other companies with money transfer service; or (3) Remitting the payment in the form of a cashier's check, certified check, or money order payable to: *International Society for Selenium Research*. A personal check in US currency will also be acceptable. Please send your check or fund transfer notice to: Dr. Zhi-Qing Lin, Department of Environmental Sciences, 2110 Science West, Southern Illinois University, Edwardsville, Illinois 62026-1099, USA; Tel.: 1-618-650-2650; Email: zhlin@siue.edu.

Season's Greetings and Best Wishes for 2026