Promoting Cardiovascular Education, Research and Prevention

CINETIAL BULLETIN OF THE INTERNATIONAL ACADEMY OF CARDIOVASCULAR SCIENCES

PUBLISHED WITH THE ASSISTANCE OF THE ST. BONIFACE HOSPITAL ALBRECHTSEN RESEARCH CENTRE



Page #

In this Issue

| | - |
|--|----|
| Behind the COVID-19 Pandemic is a Potentially Larger Health Concern and a Challenge to Cardiovascular Surgery | 2 |
| Some Selected Books for the Benefits of the Cardiovascular Community | 5 |
| CV Network Editorial Board | 7 |
| Update on the North American Meeting of the ISHR and IACS, September 6-9, 2022, Winnipeg, Canada | 8 |
| New Frontiers in Basic Cardiovascular Research 2022 International Symposium in Bratislava, Slovakia | 12 |
| Academy Remembers Dr. Dennis "Ben" McNamara: Visionary and Cardiovascular Leader | 14 |
| 2nd Announcement of the 8th European Section Meeting of the IACS, September 28 – October 1, 2022, Szeged, Hungary | 15 |
| Springer Publishes Books on Systemic Manifestations of COVID-19 and Biomedical Translational Research | 25 |
| 1st Conference of European Academy for Molecular Hydrogen Research in Biomedicine | 26 |
| Official Partnering Journals of the IACS | 32 |

Behind the COVID-19 Pandemic is a Potentially Larger Health Concern and a Challenge to Cardiovascular Surgery

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Invasive Cardiovascular Surgery Yesterday and Today

Throughout the majority of the 20th century, invasive surgical procedures in the cardiovascular field became an increasingly practiced strategy to provide valuable therapy for patients with heart and vascular challenges. Dr. Elliott Cutler at the Peter Bent Brigham Hospital in Boston performed the world's first successful heart valve surgery in 1923¹. It was a mitral valve repair. Although many surgeons participated in the early forms of transcatheter aortic valve replacement (TAVR), Cribier and colleagues are credited with the first TAVR performed almost 80 years later in 2002². In 1958, the first implantable pacemaker was successfully installed by Dr. Ake Senning into the chest of a 43 year old male patient who suffered from complete heart block³. Two years later, the first CABG was performed by Dr Goetz⁴. In late 1967, the first human heart transplant was achived at Groote Schuur Hospital in Cape Town, South Africa by Dr. Christiaan Barnard⁵. The first coronary angioplasty (also called percutaneous coronary intervention of PCI) was carried out by Dr. Andreas Gruentzig in Switzerland in 1977⁶. The first cardiac congenital surgical procedure attempted and successfully completed in the USA was ligation of a patent ductus arteriosus performed in 1938 by Dr Robert Gross at the Children's Hospital in Boston⁷. Just these invasive cardiac surgical procedures total about 2 million per year in the USA alone. The frequency of use for these procedures in the 21st century, particularly for PCI, is increasing over time, not decreasing^{8,9}.

It is perhaps not surprising that all of the invasive cardiovascular procedures implemented and used so frequently today occurred after antibiotics were initially discovered and developed in the 1920's. Without antibiotics to combat the bacterial infection that would inevitably accompany these surgeries, these techniques, which are considered to be so valuable and life saving today, would never have been possible. It may be a useful theoretical exercise to consider the impact on patient care, morbidity and mortality if this strategic approach to cardiovascular disease was largely removed as a therapeutic option. If antibiotics were to become ineffective for some reason or were never discovered in the first place, would these important invasive cardiovascular surgeries ever been possible? In this context, it is entirely likely that the more invasive approaches like heart transplants and CABGs would have been, at best, severely reduced in numbers or in the worst scenario, may have been eliminated completely. However, is such an exercise only theoretical? Are these scenarios simply wild conjecture or could this actually happen?

The Challenge of Bacterial Multi-Drug Resistance to Antibiotics

It may be helpful to harken back to the early decades of the 20th century to remember the rates for life expectancy and the causes of death at that time. In 1900, life expectancy in the US was about 50 years old. The main causes of death at the turn of the 19^{th} century and throughout the early decades of the 20th century were pneumonia, dysentery, enteritis, diphtheria and tuberculosis¹⁰. These are all diseases induced by bacterial infections. These diseases were controlled and the associated mortalities largely eliminated by the discovery and proliferative use of penicillin in medical practices throughout the US. Penicillin was followed by the other antibiotic classes tetracyclines, macrolides, fluoroquinolones, and carbapenems. The antibiotic age summoned in a wondrous and unprecedented time whereby life expectancy almost doubled over the entire 20th century¹¹ (Figure 1).

Unfortunately, this time of antibiotic action may be coming to an end. The antibiotic age has been threatened by the onset of bacterial resistance. Simultaneously, the resistance of pathogens to antibiotics has grown exponentially. The existence of bacterial resistance to antibiotics is not a new phenomenon. It has been identified for decades and actually predicted in 1945 by Sir Alexander Fleming, the scientist who discovered the first antibiotic, penicillin¹². Only 12 years after the discovery of penicillin, resistance to penicillin was identified¹³. Even more disturbing is the antibiotic resistance identified as little as 8 years after the creation of the tetracycline and carbapenem classes of antibiotics¹³.





The first case of methicillin-resistant Staphylococcus aureus (MRSA) was identified in 1962, and resistance has now been shown against almost all antibiotics that have been developed¹⁴. However, whereas in the past it was only a distant threat to medical treatment of infectious diseases, it has only recently become such a significant concern that the World Health Organization has identified it as one of the three greatest threats to life on this planet¹⁵. It is an especially serious medical issue for relatively closed medical environments like hospitals and elderly care homes where the spread of multi-drug resistance in pathogenic bacteria has become a major problem with few options for its resolution. The prevalence of difficult to treat multi-drug resistant nosocomial organisms is rapidly increasing for both gram-positive and gram-negative bacteria, although gram-negative bacteria currently pose the largest threat¹⁶.

New forms of antibiotic resistance can easily international borders and spread rapidly¹⁷. cross Worldwide, 17 million people die each year from bacterial infections¹⁸. Twenty-three thousand deaths annually are attributed to multi-drug resistance^{17,19} and 10 million deaths are estimated to occur due to resistant infections by 2050 if a strategy is not found to prevent multi-drug resistance ²⁰. This is estimated to exceed deaths from cancer. The mortality, morbidity and health care costs associated with multi-drug resistance bacteria will escalate to \$100 trillion by 2050 and reduce world economic output by between 2% and 3.5%, based on scenarios modelled by researchers Rand Europe and auditors KPMG headed by economist Jim O'Neill who was appointed by UK Prime Minister David Cameron in July 2018 to head a review of antimicrobial resistance²⁰. In the US, >2.8 million antibiotic-resistant infections occur each year with in >35,000 deaths²¹. In Canada, there were 250,000 resistant bacterial infections in 2018 and more than 5,400 directly related deaths, only slightly fewer deaths than from Alzheimer's disease²². Dr Eric Meslin, President and CEO of the Council of Canadian Academies stated "Antimicrobial resistance will profoundly affect the way we live, how our health is managed, and our general quality of life. As resistance rates increase, bacterial infections will be harder to treat, and the routine surgeries and interventions that people have come to expect and rely on may be too risky to undertake"²². The threat of multi-drug resistance is very real, very imminent and should be a priority concern for the research community to address.

Why Multi-drug Resistance Emerged

How do we find ourselves in such a dire medical predicament? What factors have caused multi-drug resistance and perpetuate its transmission and growth? There are three primary hypotheses that have been advanced to explain the emergence of multidrug resistance in bacteria. A brief summary of these mechanisms is as follows, however, more extensive discussion of each of these factors can be found elsewhere^{12,14,23,24}. First, the overuse of antibiotics has been shown to have a direct relationship with the emergence of bacterial resistance¹⁴. The average number of antibiotic courses prescribed per year in certain states in the US exceeds the population size. More than one treatment is prescribed per person per year^{14,19}. Second, inappropriate prescribing of antibiotics also contributes to bacterial resistance¹⁴. Antibiotics are inappropriately prescribed in approximately 30% to 50% of cases¹⁴. Third, antibiotics are used extensively to enhance livestock growth in the agricultural industry. Roughly 80% of antibiotics are used in animals¹⁴. This cultivates antibiotic resistant bacteria in the flora of the animals, which has dire consequences for its transmission to consumers and the environment¹⁴. Regulatory barriers represent another major factor contributing to antibiotic resistance¹⁴. Alterations to the standards and design of clinical trials by the Food and Drug Administration (FDA) in the US have made trials for new antibiotics very arduous, with increased costs and large sample size requirements²⁵. Despite the efforts to reduce the use of antibiotics, the current COVID-19 pandemic has done nothing but accelerate the onset of bacterial resistance. Most patients in hospital ICUs are treated with massive doses of antibiotics. This has been predicted to once again stimulate the resistance.

The Implications of Multi-Drug Resistance for the Cardiovascular Field

The effect that multi-drug resistance will have on invasive cardiovascular therapy cannot be overestimated. Bacterial infections resistant to current antibiotic therapy have already been identified in the cardiovascular surgical theatres and it appears to be on the rise. The problem of multi-drug resistance will ultimately render cardiac surgeries, Caesarian sections, knee replacements and invasive surgery of any kind obsolete due to the risk of infection. The practice of cardiovascular surgery and medicine in general will be changed dramatically. It is reasonable to expect the average life span will decrease, just as it increased with the advent of antibiotics a century ago. An awareness of this potential risk to cardiovascular therapy by physicians and researchers within the field is a necessary first step. The development of novel therapeutic strategies to address bacterial resistance to traditional antibiotics is a reasonable, significant research approach to address the significant threat. Although there are potential options being developed²⁶⁻³⁰, the problem is far from solved. More extensive research support is needed to develop new platforms for antibiotic action. Is it possible to develop novel invasive surgical approaches to vascular and cardiac disease without inducing infections? A complete re-direction of our strategic thinking to address cardiovascular disease may be required.

The cardiovascular research field may be in for a rocky road in the very near future. Strap on your seat belt and get your family prepared. Or take the challenge in the laboratory and identify a solution. The gauntlet has been thrown down for you by pathogenic bacteria. A proactive research stance will be essential if we are to avoid yet another exhausting pandemic.

Acknowledgements

This work was supported by a CIHR Foundation grant to GNP and a NSERC Discovery Grant to PD.

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Some Selected Books for the Benefits of the Cardiovascular Community

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It is noteworthy that most of the cardiovascular drug development took place during 40 years (1960-2000) for the treatment of heart disease. Likewise, several books and monographs depicting the observations and viewpoints of various investigators in the area of cardiovascular science and medicine during that time period have appeared in the literature. In fact, the information recorded in these books laid the foundation of experimental cardiology and provided stimulus for promoting the scientific basis for the practice of modern cardiology and improving the therapy of heart disease. Particularly, young investigators who are currently engaged in studying the molecular and genetic basis of cardiovascular problems, will profit greatly from the concepts for cardiac dysfunction outlined in these books. It is in this context, we have selected the following books, which we believe will be a valuable resource for understanding the pathogenesis and therapeutics of heart disease.

A. Books Published in Various Printing Presses

1. Cardiac Hypertrophy. Ed. by N. Alpert, 1971 (47 chapters & 641 pages), Academic Press, London – New York.

- Calcium and the Heart. Ed. by P. Harris and L. H. Opie, 1971, (22 chapters & 266 pages), Academic Press, London – New York.
- Experimental Cardiac Hypertrophy and Heart Failure. Ed. by R. Jacob, 1979 (41 chapters & 305 pages), Dr. Dietrich Steinkopff Verlag, Darmstadt.
- 4. Advances in Studies on Heart Metabolism. Ed. by C.M. Caldarera and P. Harris, 1982 (71 chapters & 530 pages), CLUEB, Bologna.
- Calcium Antagonism in Heart and Smooth Muscle. By A. Fleckenstein, 1983 (38 chapters & 399 pages), John Wiley & Sons, New York.
- The Failing Heart: Adaptation and Deadaptation. By F. Z. Meerson and Edited by A.M. Katz, 1983 (8 chapters & 323 pages), Raven Press, New York.
- 7. Physiology and Pathophysiology of the Heart Ed. by Nicholas Sperelakis, 1984 (40 chapters & 846 pages), Martinus Nijhoff Publishing, Boston.
- Heart Dysfunction in Diabetes. By G.N. Pierce, R.E. Beamish and Naranjan S. Dhalla 1988 (10 chapters & 245 pages), CRC Press, Boca Raton.
- 9. The Diabetic Heart. Ed. by M. Nagano and N.S. Dhalla 1991 (43 chapters & 533 pages), Raven Press, New York.

- 10. The Cardiomyopathic Heart. Ed. by M. Nagano, N. Takeda and N.S. Dhalla 1994 (44 chapters & 464 pages), Raven Press, New York.
- The Adapted Heart. Ed. by M. Nagano, N. Takeda and N.S. Dhalla 1994 (38 chapters & 520 pages), Raven Press, New York.
- The Failing Heart. Ed. by N.S. Dhalla R.E. Beamish, N. Takeda and M. Nagano, 1995(39 chapters & 524 pages), Lippincott - Raven Publishers, Philadelphia.
- Heart Hypertrophy and Failure. Ed. by N.S. Dhalla, G.N. Pierce, V. Panagia and R.E. Beamish 1995 (35 chapters & 531 pages), Kluwer Academic Publishers, Boston,
- 14. Mechanisms of Heart Failure. Ed. by P.K. Singal, I.M.C. Dixon, R.E. Beamish and N.S. Dhalla, 1995 (38 chapters & 453 pages), Kluwer Academic Publishers, Boston.
- 15. Pathophysiology of Heart Failure. Ed. by N.S. Dhalla, P.K. Singal, N. Takeda and R.E. Beamish 1996 (36 chapters & 578 pages), Kluwer Academic Publishers, Boston.
- The Developing Heart. Ed. by B. Ostadal, M. Nagano, N. Taked and N.S. Dhalla 1997 (34 chapters & 501 pages), Lippincott - Raven Press, Philadelphia.

B. Books Series: Recent Advances in Studies on Cardiac Structure and Metabolism; Series Editor*: Rona G, University Park Press, Baltimore (*For volumes 1 and 2, G. Rona and E. Bajusz served as Series Editor)

Volume 1: Myocardiology. Ed. by E. Bajus and G. Rona, 1972 (78 chapters & 835 pages).

Volume 2: Cardiomyopathies. Ed. by E. Bajus and G. Rona with A.J. Brink and A. Lockner, 1973 (73 chapters & 842 pages).

Volume 3: Myocardial Metabolism. Ed. by N.S. Dhalla 1973 (67 chapters & 878 pages).

Volume 4: Myocardial Biology. Ed. by N.S. Dhalla 1974 (47 chapters & 614 pages).

Volume 5: Myocardial Cell Damage. Ed. by A. Fleckenstein and N.S. Dhalla, 1975 (61 chapters & 529 pages).

Volume 6: Pathophysiology and Morphology of Myocardial Cell Alterations. Ed. by A. Fleckenstein and G. Rona, 1976 (50 chapters & 551 pages).

Volume 7: Biochemistry and Pharmacology of Myocardial Hypertrophy, Hypoxia and Infarction. Ed. by P. Harris and R.J. Bing and A. Fleckenstein 1976 (62 chapters & 491 pages).

Volume 8: The Cardiac Sarcoplasm. Ed. by P.E. Roy and P. Harris 1975 (42 chapters & 535 pages).

Volume 9: The Sarcolemma. Ed. by P.E. Roy and N.S. Dhalla 1975 (33 chapters & 490 pages).

Volume 10: The Metabolism of Contraction. Ed. by P.E. Roy and G. Rona, 1976 (61 chapters & 787 pages).

Volume 11: Heart Function and Metabolism. Ed. by J. Kobayashi, T. Sano and N.S. Dhalla. 1978 (88 chapters & 638 pages).

Volume 12: Cardiac Adaptation. Ed. by J. Kobayashi, Y.Ito and G. Rona, 1978 (88 chapters & 751 pages).

C. Books Series: Advances in Myocardiology; Series Editor: Naranajan S. Dhalla and George Rona

Volume 1: Advances in Myocardiology. Ed. by M. Tajuddin, P.K. Das, M. Tariq and N.S. Dhalla University Park Press, Baltimore, 1980 (50 chapters & 596 pages).

Volume 2: Advances in Myocardiology. Ed. by M. Tajuddin, B. Bhatia, H.H. Siddiqui, G. Rona University Park Press, Baltimore, 1980 (50 chapters & 565 pages).

Volume 3: Advances in Myocardiology. Ed. by E. Chazov, V. Smirnov and N.S, Dhalla, Plenum Medical Book Company, New York, 1982 (59 chapters & 656 pages).

Volume 4: Advances in Myocardiology. Ed. by E. Chazov, V. Saks and G. Rona, Plenum Medical Book Company, New York, 1983 (59 chapters & 649 pages).

Volume 5: Advances in Myocardiology. Ed. by P. Harris and P.A. Poole – Wilson, Plenum Medical Book Company, New York, 1985 (26 chapters & 368 pages),

Volume 6: Advances in Myocardiology. Ed. by N.S, Dhalla and D.J. Hearse, Plenum Medical Book Company, New York, 1985 (55 chapters & 649 pages).

D. Books Series: Perspective in Cardiovascular Research; Series Editor: Arnold M. Katz, Academic Press, London.

Volume 1: Developmental and Physiological Correlates of Cardiac Muscle. Ed. by M. Lieberman and T. Sano, 1975 (322 pages).

Volume 2: Neural Mechanisms in Cardiac Aarrhythmias. Ed. by P. J. Schwartz, A. M. Brown, A. Malliani and A. Zanchetti, 1978 (460 pages).

Volume 3: Ischemic Myocardium and Antianginal Drugs. Ed. by M. M. Winbury and Y. Abiko, 1979 (256 pages).

Volume 4: Prophylactic Approach to Hypertensive Diseases. Ed. by Y. Yamori, W. Lovenberg and E. D Freis, 1979 (606 pages).

Volume 5: Mechanisms of Cardiac Morphogenesis and Teratogenesis. Ed. by T. Pexieder, 1980 (526 pages).

Volume 6: Central Nervous System Mechanisms in Hypertension. Ed. by J. P. Buckley and C. M. Ferrario, 1981, (432 pages).

Volume 7: Myocardial Hypertrophy and Failure. N. R. Alpert, 1983 (720 pages).

E. Books Series: Progress in Experimental Cardiology; Series Editor: Naranajan S. Dhalla, Kluwer Academic Publishers, Boston. **Volume 1:** The Ischemic Heart. Ed. by S. Mochizuki, N. Takeda, M. Nagano and N.S. Dhalla, 1998 (45 chapters & 575 pages).

Volume 2: Angiotensin II Receptor Blockade: Physiological and Clinical Implications. N.S. Dhalla, P. Zahradka, I.M.C. Dixon and R.E. Beamish. 1998(42 chapters & 588 pages).

Volume 3: The Hypertrophied Heart. N. Takeda, M. Nagano and N.S. Dhalla, 2000 (37 chapters & 469 pages). Volume 4: Cardiac Development. B. Ostadal, M. Nagano and N.S. Dhalla. 2002 (19 chapters & 273 pages).

Volume 5: Cardiovascular Remodeling and Failure. P.K. Singal, I.M.C. Dixon, L.A. Kirshenbaum and N.S. Dhalla, 2003 (35 chapters & 545 pages).

Volume 6: Myocardial Ischemia and Preconditioning. N.S.

Dhalla, N. Takeda, M. Singh and A. Lukas, 2003(35 chapters & 541 pages).

Volume 7: Signal Transduction and Cardiac Hypertrophy. N.S. Dhalla, L. Hryshko, E. Kardami and P. K. Singal, 2003 (35 chapters & 508 pages).

Volume 8: Atherosclerosis, Hypertension and Diabetes. G.N. Pierce, M. Nagano, P. Zahradka and N.S. Dhalla, 2003 (35 chapters & 491 pages).

Volume 9: Frontiers in Cardiovascular Health. N.S. Dhalla, A. Chockalingam, H.I. Berkowitz and P.K. Singal. 2003 (41 chapters & 594 pages)

Volume 10: Pathophysiology of Cardiovascular Disease. N.S. Dhalla, H. Rupp, A. Angel and G.N. Pierce, 2004 (42 chapters & 648 pages).





Update on the North American Section Meeting of ISHR & IACS, Winnipeg, Manitoba, Canada, September 6-9, 2022



Dear Colleagues,

I am pleased to bring to your attention that arrangements for the joint meeting of the 41st North American Section of the International Society for Heart Research (ISHR) and the 9th International Academy of Cardiovascular Sciences (IACS) meeting, September 6th- 9th, 2022 at The Fort Garry Hotel in Winnipeg is well under-way!

The exciting scientific program is comprised of 5 plenary lectures, 26 Symposia, 2 poster competitions and programs for early and mid-career investigators. The scientific program will include talks from leading cardiovascular and clinician scientists worldwide; topics include heart failure, ischemic heart disease, metabolism, cardiac regeneration, fibrosis, and cardiovascular translational research with a special focus on women's heart health.

At this time, I would like to extend an invitation for you, your staff and your students to register for the meeting. Registration will include the opening ceremony, continental breakfasts, coffee breaks, lunches, poster sessions, wine and cheese receptions, and Awards Gala dinner. We expect the meeting to be highly attended so please take advantage of the early bird registration. Please note, we have extended the early bird discounted rate deadline from July 1st, 2022 to July 15th, 2022.

Please submit your abstract before July 15th, 2022 to be considered for Oral or Poster presentation. https://www.iacs2022.com/abstracts

Please visit our conference website for further information. www.iacs2022.com

Thank you for this consideration.



Dr. Lorrie Kirshenbaum Conference Chair, ISHR/IACS 2022

All photos are taken from Google Images, showing some Winnipeg tourist sights: Top left; Human Rights Museum, Top right; Assiniboine Zoo, Bottom Left; Legislative Building and Bottom right; The Forks.

Final List of Symposiums:

- 1. Pathophysiology of Cardiovascular Disease in Women
- 2. Hormonal Therapy and Women Heart Health
- 3. Translational Medicine in Cardiovascular Aging
- 4. Frailty and Cardiovascular Diseases in Males and Females
- 5. Proteomics and Proteotoxicity in Cardiovascular Dysfunction
- 6. Advances in Cardiac Repair and Gene Therapy
- 7. Advances in Cardiovascular Biology
- 8. Cardiac Regeneration and Cellular Therapy
- 9. Molecular Biology of Cell Death and Autophagy
- 10. Epigenetics and Cardiac Disease
- 11. Metabolic Syndrome in Cardiovascular Abnormalities
- 12. Metabolic Defects in the Pathogenesis of Heart failure
- 13. Role of Inflammation in Cardiac Dysfunction
- 14. Molecular Mechanisms of Hypertension
- 15. Current Concepts for the Genesis of Arrhythmias
- 16. Targets for the Prevention of Cardiac Fibrosis
- 17. Mitochondria and Cardiac Dysfunction
- 18. Cardiac Development and Congenital Abnormalities
- 19. Advances in Cardiovascular Science
- 20. Advances in Cardiovascular Medicine
- 21. Naranjan Dhalla Cardiovascular Awards Symposium
- 22. Prevention of Heart Disease
- 23. Roberto Bolli Awards Competition
- 24. Gary Lopaschuk Awards Competition
- 25. Biomaterials and Cardiac Repair
- 26. Chromatin remodeling and Gene Transcription

Hotel Accommodation:



The Fort Garry Hotel 222 Broadway, Winnipeg, MB R3C 0R3

Hotel Room Type: Double Bed, Queen Bed and King Bed available.

All participants are expected to make their own reservation from the Hotel. Special Room Rates for the conference are available on a first come, first served basis.

Deadline to receive a conference discount rate for hotel accommodation is July 1st, 2022. Any booking requests after July 1st, 2022, will have an increased rate of \$100 CAD per night for each room type.

https://www.iacs2022.com/accommodations

Conference Prices

Double Bed \$149 CAD Queen Bed \$159 CAD King Bed \$169 CAD *price per night, excluding taxes

Day 1 (Tuesday, September 6th, 2022)

| 8:00 a.m. – 5:00 p.m. | Registration Desk for ECI/MCI Scientific Symposium |
|-----------------------|---|
| 8:00 a.m. – 9:00 a.m. | Continental Breakfast |
| 9:00 a.m 5:00 p.m. | ECI/MCI Scientific Symposium |
| 4:00 p.m. – 5:30 p.m. | Registration for Invited Speakers and others |
| 5:30 p.m. – 7:30 p.m. | Welcome Remarks and 3 Plenary Lectures The Fort Garry Hotel, Crystal Ball Room |
| 7:30 p.m. – 9:30 p.m. | Welcome Reception The Fort Garry Hotel, Crystal Ball Room |

Day 2 (Wednesday, September 7th, 2022)

| 8:00 a.m 5:00 p.m. | Registration Desk |
|-------------------------|--|
| 8:00 a.m 9:00 a.m. | Continental Breakfast |
| 9:00 a.m. – 10:45 a.m. | Symposia Sessions 1, 2 and 3 |
| 10:45 a.m. – 11:00 a.m. | Coffee Break |
| 11:00 a.m. – 12:45 p.m. | Symposia Sessions 4, 5 and 6 |
| 12:45 p.m. – 1:45 p.m. | Lunch and 1 Plenary Lecture |
| 1:45 p.m. – 3:30 p.m. | Symposia Sessions 7, 8 and 9 |
| 3:30 p.m. – 3:45 p.m. | Coffee Break |
| 3:45 p.m. – 5:30 p.m. | Symposia Sessions 10, 11 and 12 |
| 5:30 p.m. – 7:00 p.m. | Poster Session 1 Reception (Wine and Cheese) |
| | |

Free Evening

Day 3 (Thursday, September 8th, 2022)

| 8:00 a.m 5:00 p.m. | Registration Desk |
|-------------------------|--|
| 8:00 a.m. – 9:00 a.m. | Continental Breakfast |
| 9:00 a.m. – 10:45 a.m. | Symposia Sessions 13, 14 and 15 |
| 10:45 a.m. – 11:00 a.m. | Coffee Break |
| 11:00 a.m. – 12:45 p.m. | Symposia Sessions 16, 17 and 18 |
| 12:45 p.m. – 1:45 p.m. | Lunch and 1 Plenary Lecture |
| 1:45 p.m. – 3:30 p.m. | Symposia Sessions 19, 20 and 21 |
| 3:30 p.m. – 3:45 p.m. | Coffee Break |
| 3:45 p.m. – 5:30 p.m. | Symposia Sessions 22, 23 and 24 |
| 5:30 p.m. – 7:00 p.m. | Poster Session 2 Reception (Wine and Cheese) |
| 7:00 p.m. – 11:00 p.m. | Banquet Dinner, Award Ceremonies and Closing Remarks <i>The Fort Garry Hotel, Crystal Ball Room</i> |

New Frontiers in Basic Cardiovascular Research 2022: International Symposium in Bratislava, Slovakia

Tatiana Ravingerova Institute for Heart Research, Slovak Academy of Sciences Bratislava, Slovak Republic Corresponding author email: Tatiana.Ravingerova@savba.sk



Participants in the Bratislava conference on Cardiovascular Research organized by Drs. Tanya Ravingerova and Monika Bartekova

The 14th meeting "New Frontiers in Basic Cardiovascular Research: France – New EU Members" was held in Bratislava, Slovakia, on May 25-27, 2022.

The conference was organized by the Institute for Heart Research Centre of Experimental Medicine, Slovak Academy of Sciences in collaboration with Slovak Physiological Society (SPhyS), Slovak Society for Biochemistry and Molecular Biology (SSBMB), partner



Left to right: Prof. Istvan Baczko, Dr. Barbora Kalocayova and Prof. Andras Varro waiting for Gala Dinner in the Castle

institutions from V4 countries (Academy of Sciences of the CR; University of Debrecen, Hungary; Jagiellonian University, Krakow, Poland) and France (INSERM) under financial support of Visegrad Foundation.

The conference was held in the conference hotel Saffron in Bratislava with the aim to continue in the successful tradition of these conferences that have been founded in 1994 by the former President of the International Academy of Cardiovascular Sciences (IACS) prof. Bohuslav Ošťádal (Prague, CR) and prof. Rodolphe Fischmeister (Paris, France). NF conferences were initially focused on the development of collaboration between the French, Czech and Slovak scientists working in the field of cardiovascular research. Since 2006, the conference embraced all countries of V4 region and became a platform for involving the scientists from other countries of European Union. So far, the conference has been organized in all V4 countries and in France. Unfortunately, the 2-year period tradition of these meetings has been interrupted by COVID-19 pandemic and has been renewed in 2022 as a classical "face to face" meeting.

To continue the tradition of the "Frontiers" meetings, the meeting featured basic scientific and clinical sessions in the

field of cardiovascular research including lectures of invited keynote speakers and free oral communications selected from the submitted abstracts.

Thus, the main topics of the symposium involved recent findings in the research of ischemic heart disease, heart failure, hypertension, arrhythmias, metabolic disorders, from genes and molecules up to clinical applications, with a special emphasis on the risk factors and genetic aspects of pathological states development, as well as on the possibilities to activate adaptive mechanisms in cardiovascular system and prevention of the diseases.

These topics were presented in 45 oral presentations and 45 posters. Many established European scientists, members of the IACS-European section including its President, Vicepresident and scientific secretary contributed with their lectures. IACS was represented by its leading representative, prof. N.S. Dhalla from Winnipeg, Canada, and by other members of IACS.

Various opportunities were provided for young investigators to discuss their latest findings with the established investigators and to compete in both oral and poster sessions. In addition to an attractive scientific program the organizers prepared an enjoyable social and cultural program.

The organizers hope that despite the tight scientific schedule, there was enough space for fruitful and stimulating discussions and chances to enjoy the city of Bratislava. The organizers wish to acknowledge the financial support from the Visegrad Foundation that enabled the attendance of many participants of the meeting.



Several participants waiting for the Gala Dinner



Prof. Jan Slezak brought Dr. Naranjan Dhalla to show his name inscribed in stone as a recipient of DSc (Hon) degree at the Presidium of the Slovak Academy of Sciences

Academy Remebers Dr. Dennis "Ben" McNamara: Visionary and Cardiovascular Leader



It is with great sadness that we announce the passing of Dr. Dennis Benjamin McNamara Jr. of Bush, Louisiana passed away peacefully at the age of 80, April 2, 2022 after a courageous battle with cancer. "Ben", as he was known to friends, family and colleagues was born in Shreveport, and is preceded in death by his parents, Inez Lyons McNamara and Dennis Benjamin McNamara Sr.

Ben lived, worked and studied in numerous cities including Shreveport, Dallas, Corpus Christi, St. Paul, Boston, St. Louis, Winnipeg, New Orleans, Old Metairie and Bush. A graduate of St. Thomas Academy, the University of St. Thomas and St. Louis University. Upon graduation Ben was awarded a Harvard Fellow at the prestigious Peter Bent Bingham Harvard University School of Medicine to work with Dr. William Weglicki.

He devoted his life to medical research and education, having been awarded the title "Professor Emeritus" after a long, distinguished career at the Department of Pharmacology, Tulane University School of Medicine. Ben traveled the world many times over attending and speaking at cardiovascular research conferences. He published many research papers, wrote for and edited various medical journals, and earned numerous awards and honors including a Lifetime Achievement Award from the International Academy of Cardiovascular Sciences.

He enjoyed a rich, full life, ultimately retiring to his beloved and beautiful property on the Northshore. Ben was an avid reader, and enjoyed gardening, taking walks, watching television, and going to estate sales. Ben shared his life over 20 years with his devoted friend, partner and spouse, Fred. Together they served on various committees and groups working at the local, State and National level to help in the rebuilding efforts after the devastation of Hurricane Katrina.

Originally Published by Bagnell & Son Funeral Home on Apr. 5, 2022.

Dr. Naranjan Dhalla says "Indeed, passing away of Ben was a terrible loss for the cardiovascular community. I have known Ben since 1968 when he moved with me from St. Louis to Winnipeg as a graduate student to undertake studies for PhD degree at the University of Manitoba. He developed a method "McNamara Method" for isolating a heavy fraction of the sarcolemmal membrane from the heart and demonstrated the presence of Ca^{2+}/Mg^{2+} ecto ATPase in both cardiac and skeletal muscles. Due to his extra-ordinary ability to develop human relationship, he readily became my friend and confidant. He helped me in developing and transforming the International Study Group for Research in Cardiac Metabolism to International Society for Heart Research during 1972-1995. Thereafter he had served on many committees and remained my advisor for promoting the International Academy of Cardiovascular Sciences. I am truly indebted to him for his kindness, friendship and encouragement and will miss him greatly".





European Section of the International Academy of Cardiovascular Sciences President: Professor András Varró Department of Pharmacology and Pharmacotherapy University of Szeged Albert Szent-Györgyi School of Medicine 12 Dóm tér, Szeged, 6720, Hungary, Ph: +36 62 545-683 Fax: +36 62 545-680 E-mail: varro.andras@med.u-szeged.hu



8th European Section Meeting of the International Academy of Cardiovascular Sciences

September 28 – October 1, 2022 Szeged, Hungary



SECOND ANNOUNCEMENT

Contact information

Department of Pharmacology and Pharmacotherapy, Albert Szent-Györgyi School of Medicine, University of Szeged, Dóm tér 12, 6720 Szeged, Hungary baczko.istvan@med.u-szeged.hu bencsik.peter@med.u-szeged.hu

Dear Colleagues,

It is our pleasure to announce that in 2022, the 8th European Section Meeting of the International Academy of Cardiovascular Sciences (IACS-ES) will be held in Szeged, Hungary, on September 28 – October 1, 2022. We are pleased to invite you to participate in this fascinating scientific meeting focusing on the following scientific topics:

- Clinical and theoretical aspects of ventricular arrhythmias and sudden cardiac death
- Atrial fibrillation: clinical therapy, novel and future strategies of AF management
- Clinical and theoretical aspects of heart failure
- Cardioprotection, clinical application of cardioprotection
- Genetics of cardiovascular disease
- Cardiac metabolism
- Novel therapeutic approaches in cardiovascular disease
- Coronary angiogenesis from bench to bedside

The meeting will feature both basic scientific and clinical sessions, including lectures of invited speakers and free oral communications selected from submitted abstracts. We would like to provide opportunities for a number of young investigators to discuss their latest results and to compete in both oral and poster sessions.

We believe that your participation will greatly contribute to the success of the meeting and provide an opportunity to discuss the latest advances in experimental and clinical cardiovascular research. In addition to high quality science, the organisers wish to provide a friendly atmosphere in the university town of Szeged. We invite you to join us at this meeting, to renew old friendships, and to make new ones!

Looking forward to meeting you in person in Szeged, With best regards,

Prof. István Baczkó, MD, PhD Chair of the Meeting

<u>Honorary Chair of the Meeting</u>: Prof. Naranjan S. Dhalla, PhD, MD (Hon), DSc (Hon) <u>President of the Meeting</u>: Prof. András Varró, MD, DSc <u>Main organizers</u>: Dr. Péter Bencsik, MD, PhD (Vice Chair) and Dr. Norbert Nagy, PhD (Meeting Secretary)



Organizing secretariat: Dr. István Baczkó, Dr. Péter Bencsik and Dr. Norbert Nagy Department of Pharmacology & Pharmacotherapy Albert Szent-Györgyi School of Medicine, University of Szeged Dóm tér 12, H-6720 Szeged, Hungary Tel.: +36-62-545-682, Fax: +36 -62-545-680 E-mail: baczko.istvan@med.u-szeged.hu bencsik.peter@med.u-szeged.hu nagy.norbert@med.u-szeged.hu

Meeting venue

Art Hotel Szeged, Somogyi u. 16, 6720 Szeged, Hungary https://artszeged.accenthotels.com/en

and

Szeged Hungarian Academy of Sciences building, Somogyi u. 7, 6720 Szeged, Hungary



The two buildings are located 50 m from each other.

Registration

Please send your completed registration form (downloadable from this website) to the following e-mails: <u>baczko.istvan@med.u-szeged.hu</u> and <u>bencsik.peter@med.u-szeged.hu</u>.

The registration fee will be **100 EUR/person for participants**, **50 EUR/person for juniors and 10** EUR/person for undergraduate students. To qualify for Junior registration fee, the registrant must be a PhD student OR have a PhD degree obtained in 2019 or later (documentation required) AND must not be older than <u>35</u>. The registration fee covers attendance of the scientific program, welcome reception, gala dinner, sandwich lunches for 2 days and coffee breaks. The registration fee of the invited speakers is covered by the organizers.

Please indicate your name and city of origin on the payment for easier processing.

Registration deadline

Registration deadline: July 31, 2022. Payment deadline: July 31, 2022.

Late registration, following July 31, 2022 is possible, at 200 EUR/person for participants and 100 EUR/person for Junior registrants, respectively. All participants will receive an official Certificate of Attendance and an official Conference Registration Fee Invoice.

Conference abstract submission deadline: July 31, 2022 for oral presentations and poster presentations. Please indicate your preference for oral or poster presentation on the registration form.

Abstract preparation information:

General requirements: please use Word document format or a compatible format. Please use Times New Roman

font, font size 12.

<u>File name</u>: please use the following format: **YOURNAME_IACSES2022.docx or doc** <u>Title</u>: Please use bold and capital letters.

Author names: please list author names and underline the presenting author.

<u>Affiliations</u>: please include affiliations, designated by superscript numbers in case of several affiliations <u>Abstract body</u>: Maximum 250 words, followed by a maximum of 5 key words. In case you want to indicate funding, please do so in a separate line in *italics font format* at the end of the Abstract.

Please send your abstract to both of the following e-mail addresses: <u>baczko.istvan@med.u-szeged.hu</u> and <u>nagy.norbert@med.u-szeged.hu</u>

Publication opportunity for presenters

The abstracts of all oral and poster presentations will be printed in an abstract book. Presenters will be encouraged to submit a full manuscript based on the material presented at the conference for consideration to be published in a special issue of the *Canadian Journal of Physiology and Pharmacology*. Manuscript submissions will be subjected to the usual peer-review process.

Young Investigator Award Competition

Young investigators (under the age of 35) are encouraged to submit their CV, oral abstract, and a maximum 2page summary of the research constituting the basis of their talk to <u>baczko.istvan@med.u-szeged.hu</u> and <u>bencsik.peter@med.u-szeged.hu</u>. A Committee will choose 6 finalists who will present their work at the Young Investigator Award Session at the meeting. **Submission deadline: July 31, 2022**. Please also indicate on your **Registration Form** your intention to participate in this competition.

Poster Awards for Young Investigators

Several poster awards will be available for young investigators (under the age of 35). Please indicate on your **Registration Form** your intention to participate in this competition.

Travel grants

Due to the increased costs of conference organization (e.g. extremely high inflation), travel grants are not available this time.

Accommodation information

All invited speakers will be lodged at the Art Hotel Szeged, their accommodation for 3 nights is covered by the organizers.

For registering conference participants, it is also possible to book rooms at the conference venue Art Hotel Szeged (<u>https://artszeged.accenthotels.com/en</u>). When booking the room at the Art Hotel please refer to the password "IACS ES Szeged 2022"

When booking the room at the Art Hotel, please refer to the password "IACS-ES Szeged 2022".

In addition, we recommend the following hotels in Szeged in the vicinity of the conference venue (we have no agreement with these hotels, therefore please do not refer to the password):

Dóm Hotel (****): https://domhotelszeged.info/en/ Science Hotel (****): https://sciencehotel.hu/en/ Mozart Hotel (****): https://www.mozarthotel.hu/en Szent János Hotel Szeged (****): https://szentjanoshotel.hu/?eng Hotel Novotel Szeged (****): http://novotel.hotelszeged.com/en/ Hotel Tisza (***): http://www.tiszahotel.hu/?lang=en Hotel Partium (***): https://partiumhotel.hu/en/

Overview of Tentative Conference Program

Day 1 (September 28, 2022) ART HOTEL SZEGED, Lecture Hall

| 13:00- | REGISTRATION |
|-------------|--|
| 15:15-15:30 | Opening ceremony |
| 15:30-19:00 | PLENARY LECTURES |
| 15:30-16:00 | Roberto Bolli (Louisville, KY, USA) |
| | Cell therapy for heart disease: Quo vadis? |
| 16:00-16:30 | Béla Merkely (Budapest, Hungary) |
| | To be announced |
| 16:30-17:00 | Coffee break |
| 17:30-18:00 | Grant Pierce (Winnipeg, MB, Canada) |
| | Bacteria and cardiovascular disease |
| 18:00-19:00 | Naranjan Dhalla Honorary Lecture |
| | Igor Efimov (Chicago, IL, USA) |
| | Transient implantable devices to treat arrhythmia: bioresorbable bioelectronics platform |
| 20:00- | Welcome Reception |

Day 2 (September 29, 2022) SZEGED HUNGARIAN ACADEMY OF SCIENCES BUILDING

Parallel sessions in Halls A-B-C

| 9:00-10:30 | SESSION 1. Novel targets for HFrEF therapy (Hall A) |
|--------------|--|
| 9:00-9:25 | Michael Czubryt (Winnipeg, MB, Canada) |
| | Fibroblast activation as a target for cardiac fibrosis therapy |
| 9:25-9:50 | Naranjan Dhalla (Winnipeg, MB, Canada) |
| | Diverse mechanisms of heart failure due to myocardial infarction |
| 9:50-10:15 | Noémi Nyolczas (Budapest, Hungary) |
| | Novelties in the treatment of heart failure with reduced ejection fraction |
| 10:15-10:30 | <oral abstract="" talk=""></oral> |
| 9:00-10:30 | SESSION 2. Basic cardiac electrophysiology (Hall B) |
| 9:00-9:25 | Thomas Jespersen (Copenhagen, Denmark) |
| | Compromised cardiac electrophysiology caused by simulated obstructive sleep apnea in a porcine model |
| 9:25-9:50 | Balázs Horváth (Debrecen, Hungary) |
| | Dynamics of the late sodium current under the action potential in canine, guinea pig and human left ventricular cardiomyocytes |
| 9:50-10:15 | Norbert Nagy (Szeged, Hungary) |
| | The role of the reverse Na^+/Ca^{2+} exchanger and the Ca^{2+} -dependent K^+ -current in sinus-node pacemaking |
| 10:15-10:30< | Oral abstract talk> |

| 9:00-10:30 9:00-9:25 | SESSION 3. Natural compounds in cardioprotection (Hall C) Dragan Djuric (Belgrade, Serbia) |
|-----------------------------------|--|
| 9:25-9:50 | Possible cardioprotective effects of vitamins B6 and B9: lessons from cardiometabolic models Monika Barteková (Bratislava, Slovakia) Potential implications of guarantin in cardioprotection |
| 9:50-10:15 | Ranko Skrbic (Banja Luka, Serb Republic of Bosnia Herzegovina) Beneficial cardio-metabolic properties of Pomegranate peel extract: results of clinical and |
| 10:15-10:30 <i>10:30-11:00</i> | <pre>experimental studies <oral abstract="" talk=""> Coffee break</oral></pre> |
| 11:00-12:30 | SESSION 4. Metabolic diseases (Hall A) |
| 11:00-11:25 | Gary Lopaschuk (Edmonton, AB, Canada) |
| | Preventing cardiac insulin resistance in the failing heart |
| 11:25-11:50 | Danina Muntean (Timisoara, Romania) |
| | Alleviation of MAO-related oxidative stress by antidiabetic drugs: of mice and men |
| 11:50-12:15 | Tamás Csont (Szeged, Hungary) |
| 12.15 12.20 | Cardiac effects of diet-induced hypercholesterolemia |
| 12:13-12:30 | |
| 11:00-12:30 | SESSION 5. Pathophysiology of atrial fibrillation (Hall B) |
| 11:00-11:25 | Ursula Ravens (Freiburg, Germany) |
| | Mechanosensitive channels, stretch and fibrosis - a pathophysiological role in atrial fibrillation |
| 11:25-11:50 | José Jalife (Madrid, Spain) |
| | Molecular mechanisms underlying the progression of paroxysmal to persistent atrial fibrillation |
| 11:50-12:15 | Katharine Dibb (Manchester, UK) |
| 12.15.12.20 | Atrial remodelling in heart failure: consequences and recovery |
| 12:15-12:30 | <oral abstract="" talk=""></oral> |
| 11:00-12:30 | SESSION 6. Molecular hydrogen and gasotransmitters (Hall C) |
| 11:00-11:25 | Ján Slezák (Bratislava, Slovakia) |
| | Saturation of donor and recipient with molecular hydrogen alleviates graft dysfunction and overall condition after transplantation of the heart |
| 11:25-11:50 | Barbora Kaločayová (Bratislava, Slovakia) |
| | Molecular hydrogen: new protective tool against acute kidney injury associated with cardiac surgery |
| 11:50-12:15 | Jerzy Beltowski (Lublin, Poland) |
| | Role of hydrogen sulfide in statin-induced inhibition of insulin secretion |
| 12:15-12:30 | <oral abstract="" talk=""></oral> |
| 12:30-14:00 | Lunch |

| 14:00-16:00 | Young Investigator Award Competition (Hall A) 6 selected young competitors, each with a 15 min talk + 5 min for discussion |
|----------------|---|
| 14:00-16:00 | SESSION 7. Vascular pathology (Hall B) |
| 14:00-14:25 | Chandrasekharan Kartha (Kochi, Kerala, India) |
| | Molecular mechanisms in the pathogenesis of cerebral arteriovenous malformation |
| 14:25-14:50 | Devendra Agrawal (Pomona, CA, USA) |
| | Novel therapeutic approach to prevent maturation failure of arteriovenous fistula |
| 14:50-15:15 | Ramesh Goyal (New Delhi, India) |
| | ACE-2 modulators for the treatment of post-COVID-19 complications including cardiovascular disorders |
| 15:15-15:40 | Ghassan Bkaily (Sherbrooke, QC, Canada) <i>Taurine and high salt-induced vascular smooth muscle remodelling</i> |
| 15:40-16:00 | <oral abstract="" talk=""></oral> |
| 14:00-16:05 | SESSION 8. Myocardial ischemia/reperfusion injury: novel directions (Hall C) |
| 14:00-14:25 | Péter Ferdinandy (Budapest, Hungary) |
| | Development of miRNA therapeutics for cardioprotection |
| 14:25-14:50 | Lorrie Kirshenbaum (Winnipeg, MB, Canada) |
| | Regulation of autophagy and cardiac cell death pathways in the heart |
| 14:50-15:15 | Suleiman Saadeh (Bristol, UK) |
| | Cardiac pathology and vulnerability to reperfusion injury during open heart surgery |
| 15:15-15:30 | <oral abstract="" talk=""></oral> |
| 15:30-15:45 | <pre><oral abstract="" talk=""></oral></pre> |
| 13.45-10.00 | |
| 16:15-18:30 | Poster Session I (even poster numbers, ACADEMY BUILDING) |
| Day 3 (Septer | mber 30, 2022) SZEGED HUNGARIAN ACADEMY OF SCIENCES BUILDING |
| Parallel sessi | ons in Halls A-B-C |
| 9:00-10:30 | SESSION 9. Myocardial calcium handling (Hall A) |
| 9:00-9:25 | Martin Morad (Charleston, SC, USA) |
| | Calcium signaling consequences of CPVT mutations in caffeine and calcium binding sites of ryanodine receptor: evidence from CRSPR/Cas9 gene edits in human ipSC-CMs |
| 9:25-9:50 | David Eisner (Manchester, UK) |
| | Background Ca^{2+} entry and Ca^{2+} waves in cardiac muscle |
| 9:50-10:15 | Antonio Zaza (Milan, Italy) |
| | <i>PLN- R14del, a controversial cardiomyopathy - observations from patient-derived cardiomyoctes and transgenic mice</i> |
| 10:15-10:30 | <oral abstract="" talk=""></oral> |
| 9:00-10:30 | SESSION 10. Pathologies associated with altered hemodynamics (Hall B) |
| 9:00-9:25 | Bohuslav Ostadal (Prague, Czech Republic) |

| 9.25-9.50 | Developmental aspects of cardiac adaptation to increased work load Tamás Badovits (Budapest, Hungary) |
|-------------|--|
| 9.25-9.50 | Investigation of pressure overload-induced myocardial remodeling and pressure unloading |
| 0.50 10.15 | Induced reverse remodeling in rat models Patr Ostadal (Prome Czach Popublic) |
| 9.30-10.13 | Hemodynamic effects of extracorporeal membrane oxygenation (ECMO) in cardiogenic shock |
| 10:15-10:30 | <pre><oral abstract="" talk=""></oral></pre> |
| 9:00-10:30 | SESSION 11. Diabetic cardiomyopathy (Hall C) |
| 9:00-9:25 | Dinender Singla (Orlando, FL, USA) |
| | BMP-7 attenuates diabetic cardiomyopathy |
| 9:25-9:50 | Belma Turan (Ankara, Turkey) |
| | Differential effects of the acute or chronic applications of GLP-1 receptor agonists on the remodeling of aging heart |
| 9:50-10:15 | Fatima Mraiche (Doha, Qatar) |
| | The off-target NHE1 inhibitory effect of SGLT2 inhibitors in cardiac remodeling |
| 10:15-10:30 | <oral abstract="" talk=""></oral> |
| 10:30-11:00 | Coffee break |
| 11:00-12:30 | SESSION 12. Heart failure with preserved ejection fraction (Hall A) |
| 11:00-11:25 | Zoltán Papp (Debrecen, Hungary) |
| | Pharmacological venodilation to treat pulmonary hypertension complicating heart failure with preserved ejection fraction (PH-HFpEF) |
| 11:25-11:50 | Suresh Tyagi (Louisville, KY, USA) |
| | Remote ischemia mechanism of heart failure with preserved ejection fraction (HFpEF) |
| 11:50-12:15 | Róbert Halmosi (Pécs, Hungary) |
| | Role of mitochondrial quality control processes in heart failure |
| 12:15-12:30 | <oral abstract="" talk=""></oral> |
| 11:00-12:30 | SESSION 13. Cardiac arrhythmias: novel mechanisms (Hall B) |
| 11:00-11:25 | Carol Ann Remme (Amsterdam, The Netherlands) |
| | Pro-arrhythmic consequences of branched chain amino acid dysregulation |
| 11:25-11:50 | Godfrey Smith (Glasgow, UK) |
| | <i>Electrophysiological heterogeneity in populations of ventricular cardiomyocytes and the consequences for the action potential response to specific ion channel inhibition</i> |
| 11:50-12:15 | Andrew Trafford (Manchester, UK) |
| | TRPC6 channels as a driver of cardiac arrhythmias |
| 12:15-12:30 | <oral abstract="" talk=""></oral> |
| 11:00-12:30 | SESSION 14. Cardiac remodelling (Hall C) |
| 11:00-11:25 | Georgios Kararigas (Reykjavík, Iceland) |
| | Sex-biased responses in cardiac remodelling |
| 11:25-11:50 | Attila Tóth (Debrecen, Hungary) |

| | Direct cardiac myosin activators: positive inotropy with potential side effects |
|-------------|--|
| 11:50-12:15 | Zoltán Varga (Budapest, Hungary) |
| | Inflammasome activation in end-stage heart failure |
| 12:15-12:30 | <oral abstract="" talk=""></oral> |
| 12:30-14:00 | Lunch |
| 14.00 16.00 | SESSION 15 Condias hypertrophy (IJall A) |
| 14:00-10:00 | SESSION 15. Cardiac hypertrophy (nan A) Elizabetta Cardai (Elezanea Italy) |
| 14.00-14.23 | Lingan hypertyon big agudiomyong thuy from algetyon hygiological insights to |
| | pharmacological strategies |
| 14:25-14:50 | Alicia D'Souza (Manchester, UK) |
| | Why do athletes have cardiac arrhythmias? A view from the lab bench |
| 14:50-15:15 | Róbert Sepp (Szeged, Hungary) |
| | The genetic landscape of hypertrophic cardiomyopathy in Hungary |
| 15:15-15:40 | Péter Bencsik (Szeged, Hungary) |
| | Novel targets for volume overload induced LV hypertrophy |
| 15:40-16:00 | <oral abstract="" talk=""></oral> |
| 14:00-16:00 | SESSION 16. Myocardial conditioning and cardioprotection (Hall B) |
| 14:00-14:25 | Ricardo Gelpi (Buenos Aires, Argentina) |
| | Molecular basis of myocardial remote ischemic preconditioning |
| 14:25-14:50 | Tanya Ravingerova (Bratislava, Slovakia) |
| | Physical exercise as a form of non-ischemic ,, conditioning ": potential molecular mechanisms of cardioprotection |
| 14:50-15:15 | Frantisek Kolar (Prague, Czech Republic) |
| | Excess ischemic arrhythmias may protect against myocardial infarction |
| 15:15-15:40 | Zoltán Giricz (Budapest, Hungary) |
| | Extracellular vesicles in cardioprotection |
| 15:40-16:00 | Milan Ivanov (Belgrade, Serbia) |
| | Effects of NADPH oxiduse blockade and hyperbaric oxygen preconditioning on 4-HNE, NGAL, and HO-1 tissue expression in postischemic acute kidney injury induced in spontaneously |
| | hypertensive rats |
| 14:00-16:00 | SESSION 17. Mytochondrial function and oxidative stress (Hall C) |
| 14:00-14:25 | Antigone Lazou (Thessaloniki, Greece) |
| | Modulation of mitochondrial quality control and metabolism in cardiac dysfunction |
| 14:25-14:50 | Vladimir Jakovljevic (Kragujevac, Serbia) |
| | Association of oxidative stress and periapical lesions in hypertensive rats |
| 14:50-15:15 | Ferenc Gallyas (Pécs, Hungary) |
| | Repurposing of desethylamiodarone for cancer therapy |
| 15:15-15:40 | Márta Sárközy (Szeged, Hungary) |
| | The effects of the preimplantation factor on the development of radiation-induced heart disease in a rat model |
| 15:40-16:00 | <oral abstract="" talk=""></oral> |
| 10.10.10.00 | |

16:15-18:30 Poster Session II (odd poster numbers, ACADEMY BUILDING)

20:00-24:00 Gala Dinner and Award Ceremonies

Day 4 (October 1, 2022) SZEGED HUNGARIAN ACADEMY OF SCIENCES BUILDING

9:00-10:30 SESSION 18. Novel targets in cardiovascular disease (Hall A)

9:00-9:25 Ildikó Bock-Marquette (Pécs, Hungary)

Enhancing cardiac regenerative therapies by reminding the adult heart on its embryonic state

9:25-9:50 Norbert Szentandrássy (Debrecen, Hungary)

TRPM4 in ventricular myocardium, can it be a novel target in cardiovascular disease?

- 9:50-10:15 **Inna Rabinovich-Nikitin** (Winnipeg, MB, Canada) Shift work adversely affects myocardial autophagy and cardiac function following myocardial infarction
- 10:15-10:30 <Oral abstract talk>
- 9:00-10:20 SESSION 19. Novel targets in cardiovascular disease and considerations in cardiotoxicity (Hall B)
- 9:00-9:25 Anikó Görbe (Szeged and Budapest, Hungary) Hidden cardiotoxicity - cardiac safety testing in ischemic and comorbid conditions: development of preclinical test platforms
- 9:25-9:50 Paramjit Tappia (Winnipeg, MB, Canada) Dual role of phospholipase C isozymes during ischemia-reperfusion injury in the heart
 9:50-10:05
 Oral abstract talk>
- 10:05-10:20 <Oral abstract talk>
- 10:40-11:00 Closing Ceremony



Springer Publishes Books on Systemic Manifestations of COVID-19 and Biomedical Translational Research

R. C. Sobti Naranjan S. Dhalla Masatoshi Watanabe Aastha Sobti *Editors*

Delineating Health and Health System: Mechanistic Insights into Covid 19 Complications This book discusses the organ-specific systemic manifestations of COVID-19. The initial chapters of the book review the origin and evolution of the coronaviruses, followed by pathogenesis and immune response during COVID-19 infection. The book also provides insight into the role of angiotensin-converting enzyme 2 in the onset of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pathogenesis. It summarizes the neurological aspects of SARS-CoV2, including transmission pathways, mechanisms of invasion into the nervous system, and mechanisms of neurological disease. It also delineates the association of severe disease with high blood plasma levels of inflammatory cytokines and inflammatory markers in SARS-CoV-2 and uncovers the potential risk of virus infection on reproductive health. https://link.springer.com/book/10.1007/978-981-16-5105-2

R.C. Sobti Naranjan S. Dhalla *Editors*

Biomedical Translational Research

Drug Design and Discovery

D Springer

🖉 Springer

Basic biomedical research aims to provide a comprehensive and detailed understanding of the mechanisms that underlie the development and normal functions of humans and other living organisms. The book Translational Biomedical Sciences is a platform for clinical researchers, basic scientists, biomedical engineers, and computational biologists from different countries to express their experiences and futuristic thoughts in the form of chapters. This book, which is the third volume of biomedical translational research, focuses on the fundamental role of biomedical research in the development of new medicinal products. It emphasizes on the importance of understanding biological and pathophysiological mechanisms underlying the disease for the discovery and early development of new biological agents. The book comprehensively reviews different genomic and microfluidic and computational approaches that employ to guide drug repositioning. It also summarizes the major challenges in drug scholarly development and the rational design of the next generation of more effective but less toxic therapeutic agents. This volume is currently in press.

1st Conference of European Academy for Molecular Hydrogen Research in Biomedicine

1st Conference of European Academy for Molecular Hydrogen Research in Biomedicine

October 17th – 20th, 2022

Congress Centre of Slovak Academy of Sciences, Smolenice Castle, Slovakia



SECOND ANNOUNCEMENT & CALL FOR ABSTRACTS

Organizer

European Academy for Molecular Hydrogen Research in Biomedicine **Co-organizers**

Institute for Heart Research; Centre of Experimental Medicine; Slovak Academy of Sciences; International Academy of Cardiovascular Sciences; International Center of Education; Ministry of Education, Science, Research and Sport of the Slovak Republic



Institute for Heart Research, Centre of Experimental Medicine, Slovak Academy of Sciences Medical Sciences Pavilion, 7th floor, Dubravska cesta 9 841 04 Bratislava, Slovak Republic E-mail: <u>secretary@euh2academy.org</u> Dear colleagues and friends,

It is our pleasure to inform you that the 1st Conference of European Academy for Molecular Hydrogen Research in Biomedicine (shortly Hydrogen for Medicine) will be held in the Congress Center of the Slovak Academy of Sciences in Smolenice Castle 50 km northeast from Bratislava on October 17th-20th, 2022.

The meeting will be organized by the European Academy for Molecular Hydrogen Research in Biomedicine and Institute for Heart Research, Centre of Experimental Medicine, Slovak Academy of Sciences in collaboration with International Academy of Cardiovascular Sciences, International Center of Education, Ministry of Education, Science, Research and Sport of the Slovak Republic, and other institutions in Slovakia.

Scientific topics will be included in 5 sessions

- I. Mechanisms of Molecular Hydrogen Biomedical Effect
- II. Molecular Hydrogen Selective Antioxidant and Signaling Molecule
- III. Therapeutic Effects: Cells, Organs and Experimental Animals
- **IV.** Therapeutic Effects in Clinical Trials
- V. Other Effects of Molecular Hydrogen

The meeting will feature basic scientific and clinical presentations, including lectures of invited keynote speakers and free oral communications selected from the submitted abstracts. We would like to provide different opportunities for a number of young investigators to discuss their latest results and to compete in both oral and poster sessions.

Participants are requested to send their registration, abstract and bio-sketch with photo in their earliest convenience, but not later than July 31st.

More detailed and updated information concerning registration, accommodation and abstracts will be published on the homepage of European Academy for Molecular Hydrogen Research in Biomedicine **after June 30th** on the website: <u>https://euh2academy.org/</u>.

Looking forward to meeting you in Slovakia.

With our best regards,

on behalf of the Organizing Committee

Prof. Ján Slezák, MD, DSc., FIACS Honorary Chairman of the Meeting jan.slezak@savba.sk

RNDr. Branislav Kura, Ph.D. Chair of the Meeting branislav.kura@savba.sk

Organizers

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<u>Supporters</u>

Slovenský plynárenský priemysel, a.s. (SPP) EPH Fundation Ministry of Education, Science, Research and Sport of the Slovak Republic Drink HRW

GENERAL INFORMATION

Venue and date

Congress Center of SAS – Smolenice Castle, Slovak Republic (GPS: N48°30'49" E17°25'57")

October 17th-20th, 2022

Transportation

Participants are recommended to arrange their flights to reach **Bratislava on October**, 17th **before noon**. To reach Bratislava, Vienna airport and a regular shuttle bus to the Bratislava main bus station is optimal. **Collective transportation by coach** from the Slovak Academy of Sciences campus (Pavilion of Medical Sciences, Dubravska cesta 9, GPS: N48°10'20.1" E17°04'04.9") to the venue of the meeting in Smolenice will be organized on the day of arrival **October**, 17th at

14.00 and on the day of Departure from Smolenice on October, 17th at 14.00.

Options: arrival on October 16th and stay overnight in Bratislava, then join the coach. In the case of emergency, taxi from the Vienna airport to Bratislava/Smolenice is the next option.

Registration at the Castle

Monday, October 17th, 2022, 15.00 – 17.00

Accommodation

On the premises of the Castle

Information for presenters

Oral presentations – 20 min including discussion;

♣ - Young investigators Oral and Poster Competition. Oral presentations: 10 min including discussion.

Posters should be mounted after the registration ACCORDING TO THEIR NUMBER IN THE LIST OF POSTERS. The authors should be present during the Moderated Poster session on October 18th in the afternoon. Poster size – 80 x 120 cm (vertical).

International advisory board

Artamonov Mikhail (U.S.A.) Cinquin Philippe (France) Dhalla Naranjan S. (Canada) Laham Adnan (East Jerusalem) LeBaron Tyler W. (U.S.A.) Lee Kyu-Jae (Republic of Korea) Liu Jiankang (China) Luby Stefan (Slovakia) Noda Mami (Japan) Ohta Shigeo (Japan) Pechanova Olga (Slovakia) Ravingerova Tanya (Slovakia) Singal Pawan K. (Canada) Singh Ram B. (India) Tarnava Alex (Canada)

PRELIMINARY PROGRAM OVERVIEW

Monday, October 17th

| 15:00 - 17:00 | Arrival to Smolenice, registration, accommodation |
|---------------|---|
| 17:00 - 18:30 | Plenary Session |
| 19:00 | Welcome Party & Dinner |

Tuesday, October 18th

| 08:00 - 09:00 | Breakfast |
|---------------|---|
| 09:00 - 09:30 | Opening ceremony |
| 09:30 - 10:50 | Session I. (Mechanisms of Molecular Hydrogen Biomedical Effect) PART I. |
| 10:50 - 11:20 | COFFEE BREAK and PHOTO |
| 11:20 - 13:00 | Session I. PART II. |
| 13:00 - 14:00 | LUNCH |
| 14:00 - 15:40 | Session II. (Molecular Hydrogen - Selective Antioxidant and Signaling Molecule) PART I. |
| 15:40 - 16:00 | COFFEE BREAK |
| 16:00 - 17:10 | Session II. PART II. |
| 17:15 - 19:00 | Moderated Poster session. (Cheese & Wine) |
| 19:00 | Dinner |
| | |

Wednesday, October 19th

| 08:00 - 09:00 | Breakfast |
|---------------|---|
| 09:00 - 10:10 | Session III. (Therapeutic Effects: Cells, Organs and Experimental Animals) |
| 10:15 - 11:15 | Session IV. (Therapeutic Effects in Clinical Trials). PART I. |
| 11:15 - 11:30 | COFFEE BREAK |
| 11:30 - 13:00 | Session IV. PART II. |
| 13:00 - 14:00 | LUNCH |
| 14:00 - 18:00 | Free time. Optional excursions: Tour to the Trnava city and a visit of the Sessler Brewery. |
| | Wine tasting – Garden Party |
| 18.30 - 22:30 | Farewell party. Announcement of the Winners of Young Investigator Oral and Poster Competitions. |
| | Award Giving Ceremony. |

Thursday, October 20th

| 08:00 - 09:00 | Breakfast |
|---------------|--|
| 09:00 - 11:50 | Session V. (Other Effects of Molecular Hydrogen) |
| 11:50 - 12:10 | Plenary session of EAH |
| 12:15 | Closing remarks |
| 12:30 - 13:30 | LUNCH |
| 14:00 | Departure |

INSTRUCTIONS FOR PREPARATION OF ABSTRACT AND BIO-SKETCH

Your <u>Abstract</u> should be submitted as a separate Microsoft Word document, the word limit is 300 (1 page A4). Please use Times Roman font type, size 12, space 1.5. Please use the following order of information:

TITLE (CAPITALIZED and BOLD fonts)

Authors (bold fonts, without academic credentials, ie: do not include "MD", "Ph.D", "MSc", etc). Please indicate the presenting author with an underscore;

Institutional affiliation (italic fonts, WITH city and country); Please organize the abstract body using the subheadings: BACKGROUND; OBJECTIVES; METHODS; RESULTS; CONCLUSIONS.

Bio-sketch (short CV on separate list of paper in Word document) should not exceed 13 lines. Please use Times Roman font type, size 12, space 1.15 and attach a photo of the presenting author.

Please, fill your final registration and send abstracts and bio-sketch with photo to the organizers by e-mail before July 31st.

Abstract and bio-sketch template:

MOLECULAR HYDROGEN AS A RADIOPROTECTIVE SUBSTANCE

J. Mrkvicka¹, B. Kvietok¹, K. Planicka²

¹Institute for Heart Research, Center of Experimental Medicine, Slovak Academy of Sciences, Bratislava, Slovakia ²University Center of Electronic Accelerators, Slovak Medical University, Bratislava, Slovakia

BACKGROUND: In recent years, many studies have shown that molecular hydrogen ...

OBJECTIVES: This study aimed to assess the effect of molecular hydrogen ...

METHODS: ...

RESULTS: ...

CONCLUSIONS: ...

This work was supported by grants ...

BIO-SKETCH (short CV) TEMPLATE



Dr. Mrkvicka is a Professor of University ... working as a ... Currently, is a ... research interests include ... The objectives are ... has published about ... was rewarded ... etc. (maximum 13 lines).

List of Participants and Presentations

| Name | Country | Presentation |
|-----------------------|-----------------------|---|
| Abukisher Imad | East Jerusalem | |
| Andelova Katarina | Slovakia | Protection of irradiated rat heart: Effect of hydrogen intake |
| Artamonov Mikhail | U.S.A. | Intraosseous Hydrogen Therapy: Novel way to deliver |
| Atyakshin Dmitry | Russian Federation | Effects of molecular hydrogen on post burn injury remodeling of skin connective tissue |
| Avan Amir | Israel | Hydrogen, a Novel Therapeutic Molecule, Regulates Oxidative Stress, and Apoptosis in muscle atrophy of mice during recovery phases |
| Barancik Miroslav | Slovakia | |
| Botek Michal | Czechia | Molecular hydrogen application in exercise and training - current knowledge and future prospects |
| Cai Jianming | China | |
| Cinquin Philippe | France | COVIDROGEN: exploration in two clinical trials of the clinical interest of hydrogen inhalation and of hydrogen-rich water ingestion for Covid-19 ambulatory or hospitalized patients |
| Dayar Ezgi | Slovakia | Nitric oxide-dependent pathway in metabolic syndrome: Possible interactions with molecular hydrogen |
| Dhalla Naranjan S. | Canada | |
| Du Yuanwei | China | |
| Firment Jozef | Slovakia | The beneficial effect of molecular hydrogen in intensive care is awaited |
| Fulop Marko | Slovakia | |
| Grepl Pavel | Czechia | Effect of molecular hydrogen inhalation on cardiac autonomic activity in healthy females |
| Hancock John T. | UK | Possible direct molecular targets of H2 |
| Hassanian Seyed | Israel | Hydrogen-rich water reduces inflammatory responses in mice during atrophy |
| Mahdi | | |
| He Qianjun | China | Nanomaterials-enabled precision hydrogen therapy |
| Hyspler Radomir | Czechia | Antioxidative effects of molecular hydrogen - possible mechanisms and its application in vivo |
| Jarmar Adam | Czechia | Effect of inhaled molecular hydrogen on recovery process after eccentric muscle contraction- |
| | | downhill walking with load |
| Kalocayova Barbora | Slovakia | Application of molecular hydrogen in the cardiac surgery-associated acute kidney injury. |

| Khazaei Majid | Iran | Hydrogen-rich water could improve muscle atrophy in a hindlimb immobilization model in mice during atrophy and recovery phases |
|----------------------------------|-----------------------|--|
| Krejci Jakub | Czechia | Dose-response of hydrogen rich water on perceived muscle soreness is moderated by age |
| Kura Branislav | Slovakia | Beneficial effect of hydrogen gas on the heart that has undergone simulated heart transplantation. Possible new therapeutic agent? |
| Laham Adnan | East Jerusalem | |
| Lebaron Tyler W. | U.S.A. | The influence of ph, temperature and H2 on ORP readings and ORP-based H2 meters using in- silico and experimental data |
| Lee Kyu-Jae | Republic of Korea | Hydrogen, life energy |
| Liu Jiankang | China | Molecular hydrogen: A rising star in gas medicine |
| Long Jiangang | China | Molecular hydrogen-a novel mitochondrial nutrient |
| Luby Štefan | Slovakia | Hydrogen and Graphene |
| Lucas Kurt | Germany | Development of an effervescent hydrogen-releasing tablet |
| Ma Xuemei | China | From energy to evolution: Hydrogen metabolism in eukaryotes |
| Matolin Vladimir | Czechia | Explosion safety and risk analysis of hydrogen molecular therapy equipment. Principles of safe construction |
| Medvedev Oleg | Russian Federation | Personalized approach to the use of external molecular hydrogen in medicine |
| Noda Mami | Japan | Possible mechanisms of oxidative stress-resistance induced by molecular hydrogen |
| Ohta Shigeo | Japan | Molecular mechanism how hydrogen exerts multiple functions and the future mission of the hydrogen medicine and biology |
| Pechanova Olga | Slovakia | Nitric oxide: From the beneficial effects of the solo molecule to combination therapy with molecular hydrogen |
| Pokotylo Oleh | Ukraine | Relationships between molecular hydrogen content, ORP, ph and water mineralization in thermoses-ionizers-generators "H2 Living Water". |
| Ravingerova | Slovakia | Molecular hydrogen potentiates beneficial effects of hypoxic postconditioning against isohomic/renerfusion injury in isolated ref hearter a navel cordionretective intervention |
| Tallya Oin Shu Cun | China | Bala of hydrogen in atherogeleratic diagonal from heads to haddide |
| Sagatova Andrea | Slovakia | Kole of hydrogen in ancroscierone disease. nom oenen to bedside |
| Sagatova Allurea Shan Wanhiao | China | Hudrogen agriculture: from farm to fork |
| Singh Rom P | India | Con molecular by drog on the range on barrons on the contraction among nation to with lung demogra |
| Singal Pawan K | Tilula | Call molecular hydrogen merapy enhance oxygen saturation among patients with lung damage? |
| Sligar i awan K. Sládečková | Czechia | The effect of hydrogen rich water on performance following high intensity interval training |
| Barbora | Clevelie | Translant time of the heart Income the durities in a side in the stars have been been been been been been been be |
| Slezak Jan | Slovakia | hydrogen |
| Slezakova Silvia | Slovakia | |
| Song Guohua | China | Hydrogen reduces neutrophil extracellular traps (nets) formation in atherosclerosis |
| Soltes Ladislav | Slovakia | |
| Sumbalova Zuzana | Slovakia | Effects of molecular hydrogen on antioxidant content and mitochondria function in patients with non-alcoholic fatty liver disease |
| Sun Xuejun | China | The effects of magnesium hydride in some animal disease model and Some views on the medical |
| Tarnava Alex | Canada | Solving the discrepancy between translational and clinical research dosages with high- concentration hydrogen tablets |
| Topinka Jan | Czechia | |
| Tribulova Narcisa | Slovakia | |
| Valachova Katarina | Slovakia | Molecular hydrogen: The beneficial effects in scavenging hydroxyl, alkyloxy- and alkylperoxy- radicals |
| Valenta Michal | Czechia | Hydrogen rich water supplementation does not improve running performance at maximal aerobic speed in national level track and field runners |
| Vlkovicova Jana | Slovakia | Hydrogen rich water supplementation does not improve running performance at maximal aerobic speed in national level track and field runners |
| Wallukat Gerd | Germany | |
| Xie Keliang | China | Treatment of hydrogen gas in sepsis |
| Yan Hongli | China | |
| Zadak Zdenek | Czechia | |
| Zhang Zuoming | China | |
| Zhao Lin | China | Gut-derived molecular hydrogen: implications in metabolic syndrome |

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Editor: Dr. Ali J. Marian

Editorial Office: OAE Publishing Inc. 245 E Main Street Ste 107, Alhambra, CA 91801, USA Email: <u>editorialoffice</u> @cardiovascularaging.com;



American Journal of Cardiovascular Drugs Impact Factor: 3.571

Editor: Dr. Amitabh Prakash

Editorial Office: Adis, Springer Healthcare 5 The Warehouse Way, Northcote Auckland, 0627, New Zealand Email: amitabh.prakash@springer.com



Heart Failure Reviews Impact Factor: 4.214

Editors: Dr. Sidney Goldstein Dr. Hani N. Sabbah

Editorial Office: 233 Spring Street New York, NY 10013-1578 USA Email: <u>Marjorei.Paran@springer.com</u>

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- 4. Heart Failure Reviews

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CV Network Vol 21 No 2 • June 2022