At the forefront of basic and translational Cardiovascular Research for fifty-five years and counting

Tomasz J. Guzik[1,2], Karin R. Sipido[3], Sarah K. Brown[4], Barbara Casadei[5], on behalf of the European Society of Cardiology.

[1] UoE/BHF Centre for Cardiovascular Science, Queen's Medical Research Institute, Edinburgh, United Kingdom.

[2] Department of Internal and Agricultural Medicine, Jagiellonian University Collegium Medicum, Kraków, Poland.

[3] Department of Cardiovascular Sciences, KU Leuven, Leuven, Belgium.

[4] BHF Glasgow Cardiovascular Research Centre, Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, United Kingdom.

[5] Division of Cardiovascular Medicine, NIHR Oxford Biomedical Research Centre, University of Oxford, Oxford, United Kingdom.

It is an honour to celebrate the fifty-fifth anniversary of the journal and its service to the scientific community. *Cardiovascular Research* is the basic and translational science journal of the European Society of Cardiology (ESC) and one of the oldest journals in cardiology and cardiovascular medicine in Europe and worldwide. Since its start, the journal has been striving to serve as a guiding light in the field, publishing ground-breaking, meaningful research encompassing all topics within cardiovascular biology, physiology and pathophysiology of cardiovascular diseases.
The journal strives to support young investigators and senior experts alike, publishing a variety of article categories and utilising various platforms for the dissemination of the latest cardiovascular discoveries.

Published since 1967

The first issue of *Cardiovascular Research* was published in January 1967, under the leadership of its first Editor-in-Chief John P Shillingford. Recognising a substantial growth of discovery science in cardiology, the British Cardiac Society together with the British Medical Association established a new designated home for research that "identified and applied novel techniques and instruments in cardiology"[1]. After 25 years, in 1995, the ownership of *Cardiovascular Research* transferred to the European Society of Cardiology (ESC), becoming its second publication alongside the *European Heart Journal,* published by *Elsevier*[2]. This ensured subsequent exponential growth of the Journal and its international position and role in global cardiology. This decision also demonstrated a new commitment of the ESC to basic and translational science, bringing together both scientists and clinicians with common interests in discovery science. It emphasises the key, sometimes overlooked fact, that novel discovery and mechanistic basic science are critical for the mission of the ESC - "to reduce the burden of cardiovascular disease". Twenty-seven years later, and now published by *Oxford University Press*, *Cardiovascular Research* continues to be the second largest publication within the ESC Journals family, and an international leader in basic and translational cardiology.

At the heart of Cardiovascular Research

"Scientific discovery driving clinical delivery" is a motto at the heart of the editorial guidance for *Cardiovascular Research*. It serves as a strong reminder of the mission of the Journal, as well as the importance of the instrumental role that basic science has in answering clinical questions and identifying preventative measures, diagnostic tools, and new treatments to reduce the burden of cardiovascular disease and deliver clinical benefit.

Although the Journal was born in the UK, the *Cardiovascular Research* Editorial Team has a strong international footprint. During the leadership of its former Editors-in-Chief, the Editorial Office has resided in the Netherlands, Germany, Spain, and Belgium. In 2018, the Editorial Office of *Cardiovascular Research* returned to the UK, establishing its new Editorial Office initially in Glasgow[3] and, more recently - in Edinburgh, UK. While the core team of managing editors and executive deputy editors is located in the UK, the tremendous work of countless international Editors and Reviewers worldwide continues to serve as the backbone of the Journal. A key element to this international strength is the fact that the journal is part of the dynamically developing ESC Journal Family.

After over five decades of excellent published research, the Journal continues to grow whilst focussing on quality and impact. Beginning with just 4 issues per year at the Journal's inception, *Cardiovascular Research* will be publishing 18 issues in 2022. Articles continue to be submitted and cited by investigators around the world and the bar of scientific excellence is relentlessly rising not just in old-world established cardiovascular institutions but also in new centres and geographies. Papers submitted to the Journal are expected to make a significant contribution to the field, with translational and proof-of-concept clinical studies welcomed as well as manuscripts focused at the molecular, cellular, sub-cellular, organ, and organism level.

From filing cabinets of paper manuscripts to online submission and reviews, the Journal has gone through its own technological revolution. We aim to continue developing novel tools to support our authors and reviewers.

Cardiovascular Research has also remained very responsive to changes in research policies and societal expectations. With an underlying focus on basic discovery, we strongly believe in the need and value of the clinician scientist in cardiovascular medicine. *Cardiovascular Research* has therefore embraced the needs of translational science. New article categories focus on providing mechanistic context to clinical trials and identifying novel mechanistic questions arising from clinical research[4].

Leading the field and driving impact

The leading nature of *Cardiovascular Research* has been evident since the very beginning of its existence. Although at the time viewed as a predominantly British journal, the first article published in *Cardiovascular Research* was written by world-renowned pioneer cardiologist Dr Eugene Braunwald and colleagues from the National Heart Institute in Maryland, USA. Braunwald et al. explored the impact of increasing the frequency of contraction on the mechanisms of left ventricular contraction[5]. Since then, publishing 118 volumes and 663 issues, and counting, *Cardiovascular Research* continues to publish leading work in basic and translational cardiology. We focus on novel, innovative, and state-of-the art solutions to complex cardiovascular mechanistic puzzles in areas including heart failure, ageing, hypertension, diabetes, atherosclerosis, metabolism, RNA

therapeutics, sex differences in cardiovascular disease, epigenetics, gut microbiota, and much more[6-7].

Articles published in *Cardiovascular Research* have been and continue to be cited thousands of times. Analysis of total yearly citations show that Cardiovascular Research is a clear leader among the ESC Journals with, on average, 31000 yearly citations in 2021 Whilst citations can take time to collate for articles, particularly in basic research, the highest cited articles in the Journal's history include those focused on matrix metalloproteinases and TIMPS[8] and inflammatory responses to myocardial infarction[9]. More recently, articles on cardiac fibrosis[10] and the use of empagliflozin in HFpEF[11] have attracted the greatest number of citations.

Altmetric scores have also become of increasing interest since the database was established in 2011. Alongside other metrics and with their own unique impression of impact, Altmetric scores have become a useful tool to gauge interest and engagement more quickly than traditional citations and identify current trends[12]. This may translate, to some degree, in the number of citations the article will receive[13-14]. Articles attracting top Altmetric scores have focussed on the impact of air pollution on cardiovascular health[15], microRNAs that predispose to the Takotsubo syndrome[16], and more recently reviews on the global burden of heart failure and animal-free model innovations for cardiovascular research[17].

The Journal publishes 2-3 signature Spotlight Issues each year, first introduced by previous Editor-in-Chief David J Hearse. These special issues continue to attract significantly high numbers of downloads, and Invited Spotlight Review articles continue to be among the highest cited articles each year. Led by Guest Editors who are experts in their field, these issues focus on a particular topic of high interest. Spotlight Issues are an invaluable reference point for exploring the latest advances and providing future perspectives on where research on the topic is headed. Recent Spotlight Issues have focused on coronary microvascular dysfunction, inherited arrhythmias, atrial fibrillation, and cardiovascular immunology[18-19].

Cardiovascular Research has experienced a steady increase in impact factor in recent years, reaching an impact factor of 14.242 for 2021 after breaking into double figures in 2020 for the first time in the Journal's history. This reflects, the Journal's growth and its increasing impact in cardiovascular research worldwide. In the last 20 years, the number of countries that the Journal has received submissions from has expanded by 46.5%, including an increase of 77.3% of countries outside of Europe.

New waves of change

In the last decade, Editorial Teams at Leuven, Belgium (2013-2017), and since 2018 in Glasgow, UK have focused on driving the impact and quality of published research, recognising that the Journal has the capacity to continue to evolve and grow to better serve the international cardiovascular community. To this end, standing on the shoulders of giants, the Journal has established a number of new initiatives.

In 2016, at the meeting of the ESC Council on Basic Cardiovascular Science, the Journal set up a new online-only section in collaboration with the ESC Scientists of Tomorrow, an initiative championed by ESC SoT chair Professor Charalambos Antoniades. The aim was to widen the scope and highlight break-throughs in translational and clinical research, as well as discuss novel mechanisms and discoveries of non-cardiovascular diseases that may bear significance to CVD field. It would also be a

platform to showcase young upcoming scientists through the ESC Scientists of Tomorrow. Its development was strongly supported by the ESC and a dedicated Assistant Editor, Dr Efthymia Vlachopoulou[20]. In 2017, coinciding with the fiftieth anniversary of Cardiovascular Research, the Journal's online platform On*life* was launched. Five years later, Cardiovascular Research On*life* has rapidly grown with the current Editorial Team. Cardiovascular Research On*life* provides a unique hub for hot topics in cardiology, including the latest clinical trial results, interviews with leading global experts, and discussion of impactful scientific papers through an ongoing collaboration with the ESC Scientists of Tomorrow.

Whilst many countries entered lockdown amidst a global COVID-19 pandemic in 2020[21], engagement with *Cardiovascular Research* content, both COVID-19 and non-COVID-19 related, increased reflecting expanding scope of CVD research during this difficult times[22]. Publishing in a pandemic presented new challenges, such as the need to handle a rapidly growing number of new submissions whilst the availability of Editors and Reviewers decreased due to clinical demand and hospital pressures. Many investigators redirected their research to new COVID-19 projects. Many other laboratories, not conducting COVID-19 research, were in turn forced to close, stalling scientific research in many areas worldwide. We will likely continue to witness the impact of COVID-19 on scientific research for months and possibly years to come[23].

Throughout the pandemic, despite pressure to publish COVID-19 research quickly, maintaining quality was a top priority of the Editorial Team. Many authors and journals rushed to be the first to identify and unlock key information about this largely unknown virus and its cardiovascular and thrombotic complications and comorbidities [24-25]. *Cardiovascular Research* made every effort to ensure the high-quality mechanistic and clinical COVID-19 research was published in a timely fashion. This was further highlighted by the Journal's first co-publication with the *European Heart Journal,* of guidelines detailing the diagnosis and management of cardiovascular disease during the COVID-19 pandemic [26-27].

In order to continue to drive and support research and the international cardiovascular community at a time of restricted physical interaction, an interactive online forum for global discussion of key topics in cardiovascular research was created, *Cardiovascular Research Discoveries*. The forum features a monthly webinar series, also in collaboration with the *ESC Council on Basic Cardiovascular Science,* bringing together key opinion leaders and young investigators. The webinars provide an avenue for meaningful scientific exchange, collaboration, and learning across various fields in cardiology.

Social media has become an important component of the researcher's toolkit, growing exponentially in recent years and *Cardiovascular Research*'s social media engagement continues to grow year on year. Platforms such as Twitter provide an opportunity to highlight the latest research to both the wider cardiovascular community and members of the public and to share ESC and *Cardiovascular Research* news and activities in real-time with live tweeting from the Journal's Twitter account (@CVR_TomaszGuzik). Twitter also provides a space for wider education and discussion as well as networking with other researchers particularly at times of social distancing[28]. Studies have identified that articles shared on social media are more likely to receive higher citations[29-30].

The publishing landscape has also changed significantly in recent years. Impact factors (IF), traditionally considered a hallmark of a Journal's impact and influence in the field, are now calculated differently. This process has changed gradually over a period of three years, leading to a degree of instability with IF over- and under-inflation noted across journals. This is expected to settle as the 2023 IFs (which will be announced in 2024), will conclude this transition. Still, the field will be

forever changed as calculations will derive from advanced access indexing where citations are counted from the moment of first online publication. As citations can take time to build, further fluctuations are expect and the long-term impact of these changes remains to be seen.

Additionally, as more funders join the coalition, researchers are increasingly required to publish in Open Access journals, in an initiative labelled "Plan S" [31-32]. This has led to the tremendous growth of open-access journals across all science disciplines. Whether this will also lead to the establishment of new Open Access journals in the ESC family, or the flipping of existing journals to an Open Access model, remains to be seen. Further evolution into the Diamond Open Access plan and open data provides considerable food for thought for many journals, authors, and funders alike. The Diamond Open Access plan is a publication model whereby authors and readers are not charged fees and journals and platforms are academic owned and led with a community focus[33-34]. *Cardiovascular Research* will continue to adapt in order to best serve its authors and readers.

Conclusion

We are very proud to celebrate 55 years of publishing at the forefront of basic and translational cardiology and take this opportunity to thank the *Cardiovascular Research* family, past and present, including Editors, Reviewers, Authors, advisors, collaborators, and Editorial Offices who have worked tirelessly to build the Journal that we see today and who continue to drive excellence and ensure the best possible *Cardiovascular Research* of tomorrow. We look forward to many more years as the leading international basic and translational Journal of the ESC and to continuing to pave the way to reduce the global burden of cardiovascular disease.

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