

IUPAC Announces the 2023 Top Ten Emerging Technologies in Chemistry

IUPAC has released the 2023 Top Ten Emerging Technologies in Chemistry. The goal of this initiative is to showcase the transformative value of chemistry and to inform the general public about the potential of chemical sciences to foster the well-being of Society and the sustainability of our planet. The Jury*—an international panel of scientists with a varied and broad range of expertise—reviewed and discussed the diverse pool of nominations of emerging technologies submitted by researchers from around the globe and selected the final top ten, covering a range of fields from synthesis and polymer chemistry to health and artificial intelligence. These technologies are defined as transformative innovations in between a discovery and a fully-commercialized technology, having outstanding potential to open new opportunities in chemistry, sustainability, and beyond.

The 2023 finalists are (in alphabetical order):

- Artificial muscles
- Biological recycling of PET
- Chloride-mediated removal of ocean CO₂
- Depolymerisation
- GPT language models in chemistry
- Low-sugar vaccination
- Phage therapy
- Photocatalytic hydrogen
- Synthetic electrochemistry
- Wearable sensors

This year in particular, the selection promotes cross-collaboration in chemistry to create exciting emerging technologies that bridge the gap between academia and industry, while continuing the current competitiveness of chemical manufacturers. The technology readiness level varies along the different solutions—nevertheless, all show a provocative promise to reimagine our world and our society. The new additions grow the list of emerging technologies to fifty—all with a powerful potential to make our world more sustainable and all suitable solutions to the current polycrisis.

The 2023 Top Ten Emerging Technologies in Chemistry are further detailed in a feature article published in the October issue of *Chemistry International (CI)* [see page 14]. Fernando Gomollón-Bel, the author of that feature concludes by suggesting that “instead of considering chemistry the “central science,” we should consider it the “connecting science”—one

that catalyses collaboration across disciplines and encourages industrial innovation.” He also noted that “sustainability remains a universal subject throughout the “Top Ten” selections—the uttermost purpose of the initiative is still to ensure a sustainable future, advancing our society, and improving our quality of life. We need creative chemistry solutions for a better world, therefore let us work together to identify the most imaginative ideas and innovations and guarantee growth, as well as access to basic rights—including renewable energy, fuels, food, and pharmaceuticals for all.”

The first selection of the Top Ten Emerging Technologies in Chemistry was released in 2019 as a special activity honoring IUPAC’s 100th anniversary. The results were published in the April 2019 issue of *Chemistry International*, 41(2), pp. 12-17, 2019. The results of subsequent editions and the related articles in CI can be accessed at: <https://iupac.org/what-we-do/top-ten/>.

The search for the next Top Ten Emerging Technologies in Chemistry has already begun and is being led again by Michael Droescher. For more information on the search for the Top Ten Emerging Technologies in Chemistry go to: <https://iupac.org/what-we-do/top-ten/>.

*The following comprised the panel of judges for the 2023 Top Ten Emerging Technologies in Chemistry: Chair, Michael Droescher, (German Association for the Advancement of Science and Medicine), Jorge Alegre-Cebollada (Centro Nacional de Investigaciones Cardiovasculares, Spain), Mamia El-Rhazi, (Université Hassan II de Casablanca, Mohammedia, Morocco), Javier García Martínez (Universidad de Alicante, Spain), Ehud Keinan (Technion, Israel), Rai Kookana (CSIRO Land & Water, Australia), Molly Shoichet (University of Toronto, Canada), Zhigang Shuai (Tsinghua University, China), Juliane Sempionatto (Caltech, USA), Natalia P. Tarasova (D. I. Mendeleev University of Chemical Technology, Russia), and Bernard West (Life Sciences Ontario, Canada).

Awardees of the 2023 IUPAC-Zhejiang NHU International Award for Advancements in Green Chemistry

The 2023 IUPAC-Zhejiang NHU International Award for Advancements in Green Chemistry was announced and presented during the 49th IUPAC World Chemistry Congress in The Hague, The Netherlands. We congratulate Xile