

*Editorial corner – a personal view*

## The rise of interdisciplinarity: A new era in polymer research?

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Interdisciplinarity is considered an effective means in current research to handle complex scientific issues and societal challenges by facilitating collaborations between various disciplines. It involves crossing traditional boundaries between academic fields to synthesize information, perspectives, and techniques, enabling a more comprehensive understanding or innovative solutions that might not be achievable within the confines of a single discipline. In fact, significant scientific breakthroughs are often-times achieved at the interface of different areas, which is a major driving force for researchers to engage in fields integrating multiple disciplines through scientific cooperation (<https://doi.org/10.1162/qssa.00265>). Single-discipline researchers tend to approach scientific problems from a very specific perspective and therefore, they are generally bound within the norms of their own field. On the other hand, the cooperation of researchers from different disciplines allows their theories, methodologies, insights, and concepts to be combined to address complex issues.

EU decision-makers have also recognized that a successful project needs a fertile research ecosystem, which often requires an interdisciplinary approach (<https://doi.org/10.1038/d41586-023-01268-7>). According to a recent study, interdisciplinary investigators tend to be more successful in attracting funding when analyzed for their long-term performance (<https://doi.org/10.1038/s42005-021-00769-z>). Further tangible evidence of the increasing recognition of interdisciplinarity is the fact that university rankings

have also begun to acknowledge its added value. Times Higher Education (THE), one of the most respected ranking organizations, will publish its first Interdisciplinary Science Rankings in autumn 2024 (<https://www.timeshighereducation.com/news/the-and-schmidt-work-towards-interdisciplinary-science-ranking>).

Research in the field of polymers is no exception to this trend. By its very nature, it inherently involves several disciplines, such as (i) chemistry for synthesis, (ii) materials science for characterization-focused tasks, and (iii) engineering for processing-related challenges. Furthermore, when it comes to the application of products developed from polymeric materials, the range of interested disciplines widens considerably. Whereas a few decades ago, academic research was focused mainly on pushing the limits of polymers through blending or by doping them with novel reinforcement particles or fillers, lately more emphasis is placed on adjusting the properties to make them suitable for specific purposes. However, in order to define the essential requirements and expectations for the products and to deal with the necessary compromises, experts from the relevant fields need to be involved in the development process.

Exemplary scenarios where an interdisciplinary approach was required for successful research include the cooperation of materials scientists and occupational safety experts to fabricate biodegradable polymer-based facemask filter inserts (<https://doi.org/10.1002/pen.26451>), industrial engineers and geodetic

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experts to develop soil conditioning materials (<https://doi.org/10.3390/ma16237285>), computer scientists and materials engineers to develop new polymers with a materials genome approach (<https://doi.org/10.1038/s41524-019-0173-4>) or to improve additive manufacturing (<https://doi.org/10.1002/pc.28238>), and environmental scientists collaborating with chemists to perform a life cycle assessment of plastic products (<https://doi.org/10.1016/j.resconrec.2024.107443>). It is also not unprecedented that representatives from four or even more disciplines to be required to carry out a complex R&D project. For instance, a recent study describing the development of ophthalmic polymer inserts was coauthored by pharmacists, physicians, chemists, and engineers (<https://doi.org/10.1016/j.ijpharm.2023.123554>). Recent submissions to Express Polymer Letters also exhibit more and more interdisciplinary features (<https://doi.org/10.3144/expresspolymlett.2023.75>;

<https://doi.org/10.3144/expresspolymlett.2023.32>;  
<https://doi.org/10.3144/expresspolymlett.2024.43>), a trend expected to continue and possibly rise in the near future.



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