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Editorial: Women in anti-inflammatory and immunomodulating agents: 2022

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Editorial on the Research Topic
Women in anti-inflammatory and immunomodulating agents: 2022

This Research Topic "*Women in Anti-inflammatory and Immunomodulating Agents*" published in Frontiers in Drug Discovery, features a Research Topic of notable scientific articles focused on the discovery and development of immunomodulatory agents with promising therapeutic potential covering a wide range of inflammatory diseases.

Only 31.5% of researchers worldwide are women, according to UNESCO data 2021. Interestingly, this underrepresentation is not exclusive to lower-income countries where female workforce participation has been historically lower. Europe and North America, usually considered more progressive regions in terms of gender equality, stand with a modest 34% female scientists, highlighting a substantial gender disparity in the research field, which transcends cultural and economic differences, as well as geographical boundaries (UNESCO Institute for Statistics, 2019).

Nobel prize awardees in medicine and physiology follow the trends of the aforementioned statistics. In fact, there has been a total of just 13 female Nobel prize winners among 227 laureates. Although discouraging, this observation also serves to reinforce the merit of these women. In the field of immunology, Dr. Françoise Barré-Sinoussi shared a Nobel Prize in 2008 for her contribution to understanding the link between human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS). Recently, Dr. Katalin Karikó shared a Nobel prize in 2023 for her essential work in the development of COVID-19 mRNA vaccines.

Several factors contribute to the persistence of the gender gap in science, and issues such as gender bias, cultural messaging, salary parity, and parental leave remain central issues to be addressed. Considering these existing gender disparities, it becomes crucial to promote the work of women scientists in order to foster a more equitable and diverse scientific landscape. In this Research Topic, we have selected four articles led by women researchers in the area of anti-inflammatory and immunomodulating agents.

Novick details her journey in identifying different proteins and receptor interactions, through analysis of highly concentrated human urine samples with ligand affinity

chromatography. This groundbreaking research not only enabled significant advances in the field of immunology but also played a formative role in the development of pharmaceutical treatments, such as Enbrel (a rheumatoid arthritis drug) and Rebif (approved to treat multiple sclerosis). These case studies highlight the fundamental advances as well as the profound medical implications of her work.

In work led by Zhou et al., the investigators explored the potential of an edible plant, *Siraitia grosvenorii* (S.g.), to treat proliferative diabetic retinopathy through the use of network pharmacology and molecular docking methods. The active compounds and targets of S.g. were identified from the Traditional Chinese Medicine Systems Pharmacology database, focusing on oral bioavailability and drug-like characteristics. Their results identified 85 genomic targets for six active compounds of S.g., with *TNF*, *PTGS2*, and *CASP3* serving as the main gene targets. These targets showed various levels of affinity for the respective compounds, illustrating the therapeutic potential of S.g. in treating proliferative diabetic retinopathy.

Sadeghi Poor Ranjbar et al. authored an extensive review comprehensively covering the use of Ginger as an alternative treatment for inflammatory bowel disease. They discuss the results obtained throughout several preclinical studies performed in cellular and animal models, as well as in human patient trials, highlighting successes for this approach to date.

Haffner et al. found a new compound (C3) that mimics the interaction between pigment-derived growth factor (PEDF) and its cognate receptor, the 37/67 kDa Laminin receptor (LR). The authors show that this compound exhibited promising anti-inflammatory properties. Notably, compound C3 demonstrated high effectiveness in reducing IL-1β secretion following exposure to a proinflammatory stimulus, such as lipopolysaccharide (LPS). Using proteomics analysis, the researchers discovered that C3 treatment induced significant alterations in the overall protein expression profile of activated THP-1 macrophage cells, influencing signalling pathways including MYC, oxidative phosphorylation, and mammalian target of rapamycin complex 1 (mTORC1).

The papers presented in this issue are the result of the work of researchers who have investigated potential therapeutic targets and novel pharmacological compounds in order to solve unmet medical needs in immunology. Topics covered include the journey towards discovery of new protein/receptor interactions that precipitated the development of new pharmacological tools, identification of

therapeutically promising agents from a medicinal plant (S.g.) to treat proliferative diabetic retinopathy, the potential use of ginger in inflammatory bowel disease, and the promising anti-inflammatory activities of the newly discovered compound C3. This compilation, which includes both review and research articles, provides insights that could potentially improve current clinical interventions or lead to the development of new therapies.

Overall, this Research Topic highlights the diversity of anti-inflammatory and immunomodulating agents research conducted by outstanding women scientists. Their contributions offer promising advances that shape our understanding of the field and advance the design of new therapies. It is our hope that academia can continue to progress in terms of gender inclusivity at all levels of research mentorship and training to allow for exciting new advances across scientific disciplines.

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Conflict of interest

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Reference

UNESCO Institute for Statistics (2019). *Women in science*. Available at: https://uis.unesco.org/en/topic/women-science.