

## IMMUNOPHARMACOLOGY: A STATE-OF-THE ART MEETING

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On 24<sup>th</sup>-26<sup>th</sup> November 2021, the “First Meeting of the Immunopharmacology Working Group” of the Italian Society of Pharmacology (SIF) was held in Perugia.

The Meeting, organized by Pier Luigi Canonico, Ursula Grohmann, Graziella Migliorati, and Carlo Riccardi has been conceived with the aim of addressing some important issues of Immunopharmacology in pathologies characterized by immune and inflammatory processes. The ultimate aim of the program was to encourage interaction between experienced scientists and young researchers, by means of free registration, food and lodging.

Many “autoimmune” and/or “inflammatory diseases on an autoimmune basis”, including for example tumors, rheumatic diseases, diseases of the central and peripheral nervous system, and even type 1 diabetes, require pharmaco-therapeutic interventions capable of modifying the autoimmune response. Restoring and maintaining an appropriate immune/inflammatory response is important in cancer and infectious diseases. Moreover, restoration of a “physiological” immune response is the key to cure autoimmune- and immune-based inflammatory diseases.

With the advent of biotechnology, it has become imperative to identify the molecular bases of the different mechanisms acting on the components of the immune system and that are able to modify the immunological response. In this context, pharmacology, as it has already shown by others, is able to make a great contribution, especially by directing research towards new frontiers, indicating the basis for a subsequent transfer towards translational research and thus greatly improving future treatment possibilities.

The “I Meeting of the Immunopharmacology Working Group (IWG) of the Italian Society of Pharmacology (SIF)”, entitled “Recent Develop-

ments in Immunopharmacology”, aimed to give voice to the most important research groups at the national level and address some of the major characteristic themes of Immunopharmacology for some important pathologies, in order to focus on current and future therapies also evaluating the possibility of comparing the results of the most advanced preclinical and clinical research.

The meeting did (i) allow to address some of the recent developments of preclinical and clinical experimentation related to immunopharmacology as well as immunotherapy of diseases on an immunological basis; and (ii) give voice especially to young pharmacologists interested in presenting their own and original experimental data. The meeting in fact represented a means to put in “direct contact” junior pharmacologists with each other and other more experienced from the different Italian schools, in order to increase the knowledge and the possibilities of interaction and collaboration for an ever-better development of an increasingly current area.

The meeting program included four plenary lectures, namely:

- 1) “Immunotherapy in the control of type 1 diabetes” by Lucienne Chatenoud.
- 2) “Neural stem cells in neurological disorders: from biology to treatment” by Gianvito Martino.
- 3) “Biological therapies in inflammatory bowel diseases” by Antonio Di Sabatino
- 4) “New aspects of cancer immunotherapy” by Antonio Sica;

with the aim of exposing young researchers to some important topics of immunopharmacological content, presented by expert and highly recognized scientists in their respective fields. In addition, young researchers were able to present and discuss the results of their research activity and discuss them with experienced colleagues. Fifty-three abstracts (see this issue of *PharmAdvances*) have been presented and discussed as oral or poster presentations. Most abstracts could be classified according to different areas such as for example:

- immunotherapy of metabolic/autoimmune/chronic inflammatory diseases;
- immunomodulation and pathogenesis of inflammation;
- neuroinflammation and autoimmunity;
- cancer immunotherapy.

Moreover, contributions on the possible activity of natural products on inflammatory and autoimmune processes were also presented.

Among the many contributions some in particular concern specific aspects of different research areas, such as described below:

In the area of **immunotherapeutic approaches**, two oral presentations focused on inhibitors of JAKs (JAKi), already used in rheumatoid arthritis (RA). On one side, some aspects dealing with the correct use of such drugs in RA were recommended; on the other, repurposing of JAKi in

type 2 diabetes was proposed. Moreover, immunotherapy of (i) Wolfram disease by the use of valproate, an anti-epileptic drug; (ii) hepatitis with a novel CysLTR1 antagonist; (iii) colitis by the use of TAT-GILZ, a fusion protein with anti-inflammatory activity; and autoimmune diseases in general by positive allosteric modulators of Src kinases was discussed. The area of **immunomodulation and pathogenesis of inflammation** is fundamental for the transfer into translational immunopharmacology. For example, extracellular nicotinamide phosphoribosyltransferase (eNAMPT) may represent a novel biomarker not only in prostate cancer progression but also in autoimmune gastritis and celiac disease. Similarly, the immune checkpoint molecule PD-L1 secreted by endothelial cells may play an important role in chronic and basal inflammation, a condition often observed in obesity and also discussed at the meeting. The mode of action of glucocorticoids was further examined in sepsis and in neutrophils. Interestingly, data regarding the transcriptomic profile of patients with inflammatory bowel disease and the inflammasome inhibitor thalidomide were presented.

The section of oral presentation dedicated to **Neuroinflammation and autoimmunity** dealt with potential novel therapeutic pathways, such as LRKK2 inhibition in spinal trauma, modulation of T helper cells by dopaminergic drugs, understanding the role of specific dendritic cell subsets, and of the effects (antioxidant? anti-inflammatory?) of natural compounds in neuroinflammation.

In **Cancer immunotherapy**, the results from several, distinct types of study were presented. Innovative targets could be represented by OXER1 and androgenic pathways in triple negative breast cancer, PPAR- $\gamma$  in ILC2 immune cells in colorectal cancer, IDO2 in non-small cell lung cancer, AhR in a dendritic cell subset (cDC1) in a progressive fibrosarcoma, and Nr2f6 in cDC1 cells to boost adaptive immune responses. Moreover, data on the possible role of exosomes in limiting anti-PD1 efficacy has also been presented.

Overall, besides inputs from expert immunopharmacologists, several points of fresh and interesting discussion were also raised from young researchers, such that repeating a meeting like this in the future may provide a fruitful growth of the national immunopharmacology area and the blossom of our junior immunopharmacologists.

In summary, in the hope of having contributed to the scientific interest in the area of Immunopharmacology and having given a further stimulus to the young scientists involved in pharmacological research, we organized the "First Meeting of the Immunopharmacology Working Group" of the Italian Society of Pharmacology (SIF), whose outcomes are published in this Special Issue of *PharmAdvances*.

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