EDITORIAL

The last years have witnessed important development in the understanding and treatment of oncohematological affections. Until recently, for example, "classic" chemotherapy and hematopoietic stem-cell transplantation were the only therapeutic options in acute leukemia. Today, the target therapy provides a new approach for the treatment of these malignances, in which biological drugs are used to affect only cancer cells, without effects on surrounding cells, decreasing the side effects. Today monoclonal antibodies are widely used for the treatment of oncohematological diseases. In this issue, their use and application are discussed.

Laurenti and coworkers demonstrated that monoclonal antibodies such as rituximab and alemtuzumab have changed the therapy of chronic lymphocytic leukemia (CCL). Nowadays there are several new promising monoclonal antibodies under investigation against CD20, CD23, CD37 and CD40 molecules. Application of newer monoclonal antibodies represents an area of ongoing clinical research in CLL. Deaglio and coworkers described the behaviour of CD38, which is an independent negative prognostic factor in CLL patients and has been the starting point for investigations into the functional role of the molecule in the neoplastic context. As reported by Risitano and coworkers there are many diseases due to the absence of the complement regulators as CD55 and CD59. Also in this case the use of monoclonal antibodies is possible: in fact, authors demonstrated that residual hemolysis may be due to persistent activation of the early phases of the complement cascade, leading to progressive C3-deposition on PNH (paroxysmal nocturnel emoglobinuria) erythrocytes and possible subsequent extravascular hemolysis through the reticuloendothelial system. Here the authors critically review the available clinical results of eculizumab treatment for PNH patients, pointing out the recent insights into the pathophysiology of the disease. Moreover, they provide a theoretical rationale for the development of novel strategies of complement inhibition which could further improve in future on the already substantial efficacy of eculizumab. Furthermore, Risitano and coworkers reported the use of monoclonal antibodies also for the treatment of acquired bone marrow failure syndromes. Authors review the recent data on the anti-CD52 monoclonal antibody alemtuzumab as a novel immunosuppression agent for marrow failures: this drug represents an excellent alternative to ATG for all immune-mediated marrow failure syndromes. Even if the dose and the schedule may still require further refining, the available data support the need of large prospective trials comparing alemtuzumab to current standard immunosuppression regimens. On the other hand, Serio and coworkers have explorated whether predisposition to bone marrow failure syndromes, such aplastic anemia, paroxysmal nocturnal hemoglobinuria and myelosysplastic syndromes, is found in killer cell immunoglobulin-like receptor and human leukocyte antigen ligand gene variations or cytokine polymorphisms. The use of monoclonal antibodies has also been evaluated by D'Arena and coworkers: in fact, the authors reported that regulatory T-cells (Tregs) play a central role in maintaining peripheral tolerance to self-antigens and in regulating the immune response to non-self-antigens. Clinical strategies are developing targeting Tregs with the aim to reduce or abrogate the antitumor suppression. One of the major challenges is to identify a unique marker of Tregs that can be used to more specifically target these cells with selective monoclonal antibodies. Combination therapies with conventional drugs and vaccination strategies are under investigation by the authors.

Another promising strategy in the treatment of leukemias is the use of natural substances. Diet components may also modify the risk of cancer through the influence on multiple processes, including DNA repair, cell proliferation and apoptosis. In this issue, Miroddi and coworkers reported that garlic (*Allium sativum* L.), considered either food or herbal medicine, possesses antimutagenic and antiproliferative properties that can be used in anticancer interventions: they analyzed literature data on the effects of garlic and garlic compounds which can serve as basic information to design clinical approach in oncohematology. De

Martino and coworkers reviewed the natural compounds as new models for the development of drugs against various pharmacological targets, including cancer, and, above all, leukaemia. On the basis of the activity of natural molecules, harmine and 1-methoxy-canthin-6-one, Peduto and coworkers designed and synthesized a series of novel 1,4-disubstituted and 1,4,9-trisubstituted β-carbolines and tetracyclic derivatives. Cytotoxic activities of these compounds *in vitro* were investigated in a human tumor cell line panel. Almost all compounds demonstrated interesting cytotoxic activities in particular against prostate cancer cells PC-3 with IC_{50} value in the low micromolar range, suggesting further studies with models of prostate cancer.

The clinical relevance of targeting histone deacetylases in hematological malignancies was discussed by Petrella and co-workers: to date, several clinical trials of HDACi in hematological malignancies have shown a preferential clinical efficacy of these drugs in hematological malignancies, and in particular in cutaneous T-cell lymphoma, peripheral T-cell lymphoma, Hodgkin lymphoma and myeloid malignancies.

Finally, papers presented in this issue show the efficacy of an interdisciplinary collaboration among different researchers in the field of hematology, pharmacology, pharamcognosy and medical chemistry.

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