Enhancing human immune system responses to produce effective treatments has long been thought a promising approach to fighting cancer. Until recently, immunotherapeutic agents had provided very limited evidence of clinical success; however, over the last decade, we have witnessed a paradigm shift in the treatment of cancer. Now, many think that immunotherapy should be considered alongside surgery, and chemotherapy and radiotherapy as the fourth cornerstone of anticancer treatment.

Immuno-oncology is a new area of medicine that focuses on the development and delivery of therapies that improve the body’s intrinsic potential for generating an effective immune response against cancer. Although immuno-oncology is still in its infancy, immunotherapy has been yielding clinical results for some time, and the most recent agents entering the clinic look even more promising. In April 2010, sipuleucel-T became the first therapeutic vaccine to be approved by the US Food and Drug Administration for the treatment of patients with prostate cancer. Subsequently, in 2011, ipilimumab, a fully human monoclonal antibody which blocks cytotoxic T-lymphocyte-associated antigen-4, became the first agent approved in the EU for the treatment of adult patients with unresectable or metastatic melanoma who have received prior therapy that showed an overall survival benefit in a randomised phase III trial.

The success of these agents has further motivated others to undertake research in immuno-oncology. Increased understanding of the fundamentals of cellular and molecular tumour immunology, as discussed by Olivera Finn in this supplement, has identified many ways in which the immune system can be augmented to treat cancer, including priming/boosting of the immune system, T-cell modulation, reducing immunosuppression in the tumour microenvironment and enhancing adaptive immunity. An additional benefit of using an immuno-oncology approach to treatment is that because these agents often target the immune system and not the cancer, immunotherapies have the potential to offer adaptable and durable cancer control across a variety of tumour types, including those that were not previously considered likely to respond to immune manipulation. This concept is reviewed by Alexander Eggermont.

The present supplement contains articles based on presentations from the ‘Immuno-Oncology Summit’ held at the European Multidisciplinary Cancer Congress in Stockholm in September 2011. The papers serve to provide a wide-ranging overview of cutting-edge developments within the field of immuno-oncology, including the details of the biology and rationale behind immunotherapeutic strategies, such as vaccines, cytokines, toll-like receptor agonists, and T-cell modulating agents, and data from pivotal clinical trials.

We greatly appreciate the collaboration of an exceptional faculty, who discuss advances in immuno-oncology for melanoma (Michele Maio and Jedd Wolchok), prostate cancer (Winald Gerritsen), renal cell carcinoma (Bernard Escudier), and lung cancer (Martin Reck) as well as opportunities for combining immunotherapies with other therapeutic modalities (Charles Drake) and the challenges of integrating immunotherapies into clinical practice (Axel Hoos).

Following on from what was a very successful and well-attended Summit, we hope that this supplement provides you with a comprehensive update of the current and potential use of immunotherapies for the treatment of cancer.