European Journal of Immunology

News & EFIS

EFIS-EJI Ruggero Ceppelini Advanced Immunology School Course: Tumour immunology 2017: From tissue microenvironment to immunotherapy. Naples 16–18 October 2017

The tumor immunology field and its clinical developments; the immunotherapy is living a new springtime. The revolutionary strategy to wake up patients' immune systems [1, 2] has completely changed the prognosis of some tumours such as melanoma, lung cancer and haematological malignancies. Novel insights into interaction between the tumour and its microenvironment offer new treatment opportunities and hope for cancer patients, and the importance of such approaches was highlighted by the Day of Immunology which focused on immunotherapy in 2016 [3].

The Course "Tumour Immunology: From tissue microenvironment to immunotherapy" (https://www.ceppellini.it/) offered by the EFIS-EJI Ruggero Ceppellini Advanced Immunology School of Naples (the Scuola) was held from 16–18 October 2017. This follows on from previous Schools covering a variety of topics e.g. in 2016 the focus was on Metchnikoff's legacy [4]. The venue for the School in 2017 was the exciting VIII century church of San Marcellino and Festo in Naples. The church (Fig. 1) was deconsecrated by Joachim Murat in 1805 during the French period of rule in Naples.

The School was co-directed by Catherine Sautès-Fridman, Wolf Fridman (both Université Paris Decartes, Paris, France) and Ennio Carbone (Università Magna Graecia di Catanzaro, Italy) and the proceedings started with Silvia Fontana-Zappacosta's historical overview of the School. The School was celebrating its 26th year of activity, making it the oldest Immunology School operating in Europe. This was followed by a keynote lecture by Nadine Cerf Bensussan who discussed the role of microbiota in shaping the systemic immune response. Nadine showed data demonstrating how the coevolution of the bacterial populations that colonize the intestinal mucosa with the immune system has led, on the one hand, to the protection of other bacterial species and, on the other, has provided important stimuli that increase immune system protection against harmful pathogens.

The first lecture was given by Catherine Sautès-Fridman who described the interactions between the immune system and different kinds of tumours, and how these interactions shape the Tumour Micro Environment (TME) landscape. The TME landscape was dissected and discussed at both cellular and molecular levels. Compelling data showing the prognostic correlation with the composition of TME were presented, with the presence of $CD8^+$ T cells and DCs inside the tumour lesion correlating with a more favourable prognosis. Then, Wolf H Fridman discussed the cross talk that occurs at the tumour/immune system interface within the TME. Colon cancer was taken as paradigm to understand the main immunological features operating during the establishment of the primary tumour. The prevalence of a Th1 response in the TME is a hallmark of a favorable prognosis, whereas the presence of high densities of myeloid suppressor cells and fibroblasts correlates with tumour progression and immune failure to control the disease. Moreover Wolf stressed how the assessment of individual patients' TME landscape is crucial for the success of new immunotherapies.

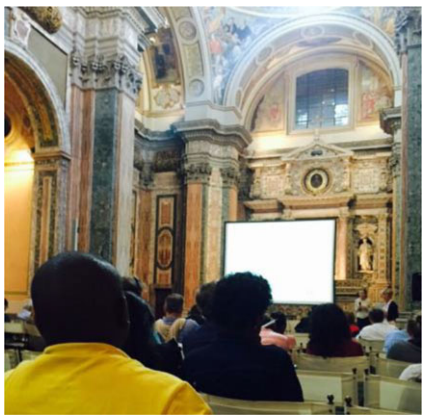

Figure 1. Overview of the audience inside the San Marcellino and Festo Church (© Fuori Rotta srl).

The subsequent presentation was by Alberto Mantovani (Milan,Italy); he opened his lecture with an intriguing historical overview highlighting how Virchow's observations on the correlation between inflammation and cancer changed the understanding of the nature of cancer i.e. from a simple genetic to a multifactorial disease. Alberto also emphasized how the subversion of the immune response by tumour cells plays a crucial role in the clinical development of cancer. Alberto discussed the role of the tumour associated macrophages (TAM) M1/M2 in regulating early stage cancer, as well describing newly defined NK cell immune checkpoints. New genomic approaches as tools to dissect tumour and immune cell interactions was the topic of Zlatko Trajanoski's (Vienna, Austria) lecture with new computational tools to process, analyse and visualize the data complexity of the TME being presented. Next the immune regulatory programs and chemotherapy susceptibility of monocytic myeloid derived suppressor

cells (MDSCs) were the topics of Vincenzo Bronte's (Verona, Italy) lecture, who discussed data showing how lentiviral vectors expressing apoptotic regulators (IDO1, PD-L1, PD-L2, IL10 and IL4Ralpha) generate strong immunosuppressive MDSCs.

Ugur Sahin (Mainz, Germany) opened the School's second day with a lecture on neoantigen formation in tumour cells. Neoantigens are a fascinating field for anti-tumour vaccine development because they are unique for a given tumour and their use in vaccine formulation may prevent autoimmune side effects. In his talk Ugur showed encouraging data related to individualized vaccines using neo-epitopes. In particular, he presented data from mouse models in which a vaccine containing the whole spectrum of neo-antigen-derived peptides may mobilize anti tumour immunity by activating $CD4^+$ T cells. Moreover, he emphasized that MHC-I restricted neoantigens are suitable vaccine targets to achieve tumour rejection. Ennio Carbone's (Catanzaro, Italy) lecture brought the student's attention to the potential role for NK cells in tumour immune surveillance and immunotherapies. After the discussion of the historical background behind the discovery of NK cells, he presented a study demonstrating that melanoma colonized lymph nodes contained an activated NK cell population showing a robust cytotoxicity against autologous tumour targets. Thus he speculated that lymph nodes could be considered a particular anatomical district where NK cells escape the suppressive influence of the tumour microenvironment. Furthermore, Ennio underlined that NK cells must be considered complementary effector mechanisms to T cells in combating cancer and as a source of biovariables that can assist anti-immune checkpoint therapy. Lorenzo Moretta's (Rome, Italy) lecture started by recapitulating the major discoveries in the field of human NK cell receptors, receptors that recognize HLA-class I molecules through Killer Immunoglobulin Receptors (KIR). Then, he presented new studies identifying, in cancer patients, a new NK cell subpopulation expressing the PD1 immune checkpoint molecule and he highlighted the recent success of NK cell adoptive immune therapy in leukaemia patients.

MHC class I loss in tumours was the subject of Soldano Ferrone's (Boston, USA) lecture. The talk focused on the importance of assessing tumour MHC class I expression for the success of immune checkpoint therapies for which the ultimate effector mechanism is thought to be mediated by $CD8^+$ T cells. Dimitrios Mougiakakos (Erlangen, Germany) directed the students' attention to recent discoveries related to tumour cell metabolism. The reprogramming of tumour cell metabolism leads to the production of catabolites that are extremely toxic for immune cells and that contribute to the development of a hostile environment that hampers anti tumour immune responses. The session was closed by Hergen Spits's (Amsterdam, The Netherlands) lecture covering Innate Lymphoid Cells (ILCs). ILCs constitute the third major lymphoid cell population after T and B cells. Among the three ILC groups, a population of ILC1 appears to be involved in immune surveillance with RORγt ILC1 (ex ILC3) having been shown to mediate tumour rejection whereas ILC2 were demonstrated to contribute to an immunosuppressive tumour microenvironment by inducing myeloid suppressor cells.

On the final day of the school, Federica Cavallo (Turin, Italy) presented data obtained following tumour vaccination in genetically modified (GEM) mouse models that spontaneously develop tumours and she discussed novel findings from clinical trials using Her2-derived epitopes to vaccinate breast cancer patients with the aim of preventing cancer recurrence. Michele Maio (Siena, Italy) gave an overview of clinical trials in melanoma patients using checkpoint inhibitors, and shared his enthusiastic perspective of tumour immunotherapy applications in the near future. In the final round table discussion of the School, which was moderated by the Course co-director Wolf Fridman, selected students gave their feedback about the course, pointing out what they learned, and asking their final burning questions that were answered by the speakers.

The Course was highly appreciated by the 52 highly motivated students who animated the discussions and contributed new ideas and visions to enrich the meeting (Fig. 2 and 3). The students came from 22 different nations, with a strong European prevalence, and for two days they actively took part in the discussions following the lectures and continued these into the coffee breaks, lunches and social dinners. This successful Course of the EFIS-EJI Ruggero Ceppellini is the 26th since the foundation of the "Scuola" by Serafino Zappacosta and it continues to bring together in Naples the best worldwide immunologists and students.

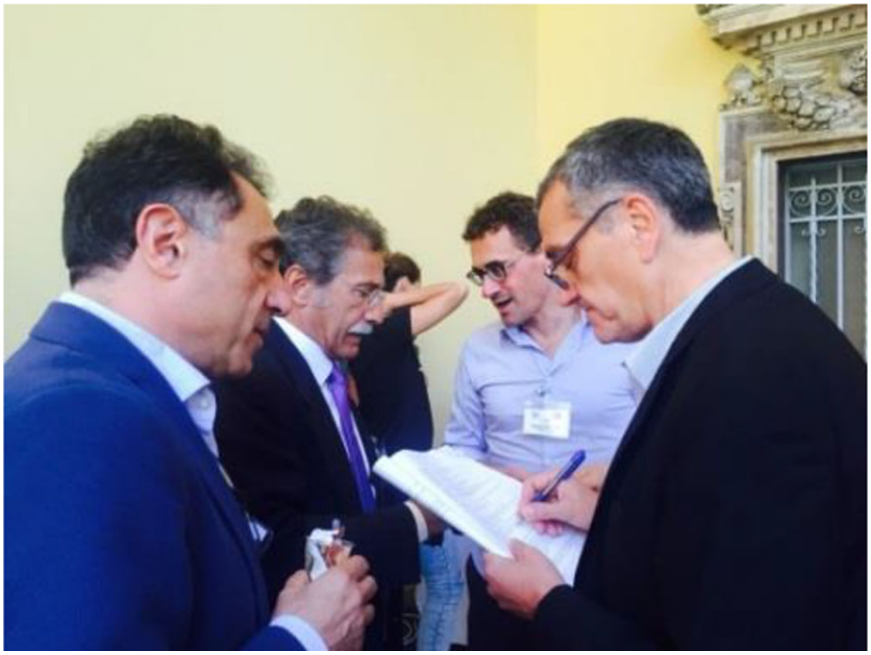

Figure 2. Faculty discussions at the coffee break. (© Fuori Rotta srl).

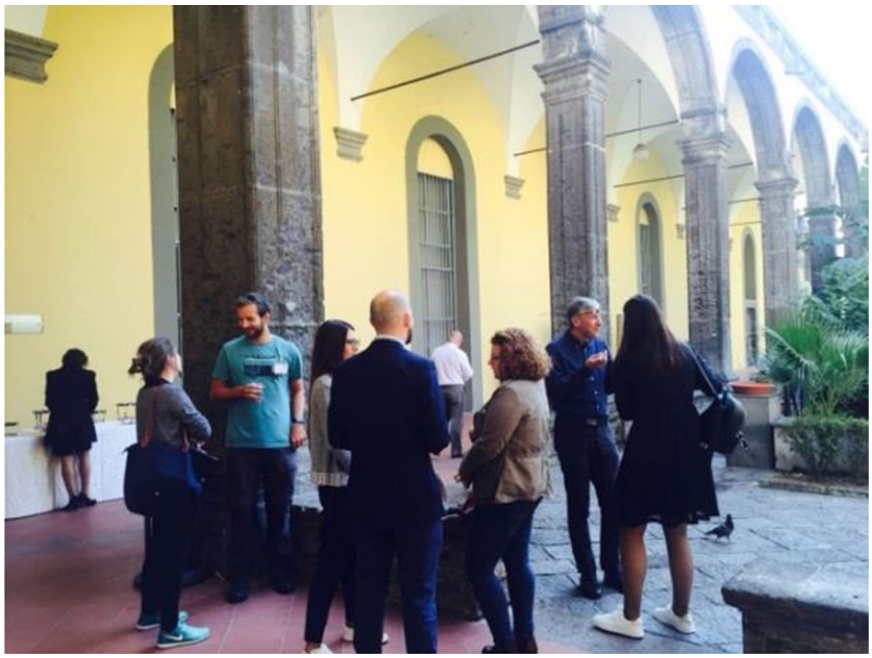

Figure 3. Discussions at the coffee-break (© Fuori Rotta).

Ennio Carbone*, Francesca Di Rosa', Wolf Fridman and Catherine Sautès-Fridman

The Course Directors, 'Immunology Advanced School "Ruggero Ceppellini" Local Committee

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5th European Congress of Immunology (ECI 2018)–2-5 September 2018 | Amsterdam, Netherlands

Held every three years and attracting over 3000 delegates, the European Congress of Immunology (ECI) is a "must attend" for all immunologists. Of note, the 5th ECI will pay special attention to "Building Bridges" by inviting scientists from related interdisciplinary fields with the aim of connecting those working in fundamental and translational sciences in order to drive key therapeutic and diagnostic advances and. The 5th ECI will take place in the city of Amsterdam under the auspices of the Dutch Society for Immunology (NVVI) and the European Federation of Immunological Societies (EFIS).

EFIS together with the European Journal of Immunology (EJI) and with a contribution from the Fondation ACTERIA will be awarding up to 250 Travel Grants of EURO 600 each to post-docs and PhD-students under 35 years of age. For more information about the travel grants visit: https://www.efis.org/efis-support/travel-grants/index.html

Abstract submission deadline: 23 April 2018

Early Registration deadline: 29 June 2018

For further information visit: https://www.eci2018.org