Georges Mathé : a Pioneer of modern Immunotherapy and Oncology

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Georges Mathé was born in 1922 in a small village of the center of France. He studied medicine in Paris during WWII while performing clandestine medical functions for the Resistance. After graduation, he specialized in Hematology, Physiology, Nephrology, Immunology and Pediatrics in some of the best hospitals in Paris and received a gold medal at the end of his training in 1951.

In 1951, he spent a year in New York, at the Sloan Kettering Memorial Cancer Center where Joseph Burchenal, David Karnovsky and Charlotte Friend introduced him to Cancerology, Chemotherapy and Virology.

Upon returning to France in 1952, he started working with Pr Jean Bernard on child leukemia in Herold, then Saint Louis hospitals. He engaged in Chemotherapy by applying the screening technique inherited from Joseph Burchenal.

From 1954 to 1958, Georges Mathé conducted research for the French National Hygiene Institute (INH). The International Atomic Energy Agency (IAEA) granted him financial support for the development of a laboratory devoted to study blood restoration following total irradiation. He worked on bone marrow grafts with John Loutit and Dirk Van Bekkum who were experimentating on animals but his objective was also clinical application.

In the second half of the 1950 ies, Georges Mathé thus committed himself to studying the Graft Versus Host immune reaction and the possibilities of reducing it. He also researched the potential use of bone marrow transplants in leukemia.

At that time, transplants were tried on animals and could be practised on human twins, but immunology was not sufficiently advanced to support clinical experimentation.

The turning point was the nuclear accident which took place on october the 15th, 1958 in Vinca, near Belgrade, which irradiated six engineers; one received a dose of of 800 rem which proved lethal, one received a dose of 400 rem which enabled him to restore his bone marrow. The four victims who had received 600 rem were transplanted by Georges Mathé and Henri Jammet from november 11 november 20th, 1958, at the Curie Hospital in Paris. They received the bone marrow of unrelated donors ; Georges Mathé had decided to play the card of mixed chimerism and proved to be right because no notable GVH occured. In order to protect the patients from any risk of infection while they were in aplasia, Georges Mathé placed them in sterile rooms.

In the wake of these first successful allogeneic transplantations, Georges Mathé cooperated in 1960-61, with Marcel Kuss and René Legrain to achieve several kidney grafts between non related persons.

Having conceived the concept of Adoptive Immunotherapy using the patient's immune system to fight cancer, Georges Mathé applied in 1963 the bone marrow transplant technique to leukemia, in order to exploit the Graft Versus Leukemia (GVL) syndrom which he had been investigating on animals.The patient was cured from his disease but died two years later from a secondary syndrom.

In the 1960 ies, Georges Mathé, who was in charge of Hematology at the Institut Gustave Roussy in Villejuif, also created at the adjacent the Hospital Paul Brousse, the Institut de Cancérologie et d'Immunogenetique (ICIG) which included a research laboratory, a virology laboratory, a branch of the Medical University (with student housing) and a clinical hospital including sterile rooms. An international team of brilliant young reseachers and doctors worked with him on fighting cancer. In 1967, Georges Mathé created and organized Experimental Cancerology Studies which trained in Villejuif most of the future french oncologists.

In the 1970 ies, Georges Mathé developed Active Immunotherapy preparing the immune system to fight against cancer. He also worked on Passive Immunotherapy using antibodies.

While actively researching Immunotherapy, Georges Mathé was continuing to work on Chemotherapy ; he participated to the development of half a dozen of active molecules, among which Vinorelbine and Oxaloplatine.

He also played a major role in the development of Hormonotherapy.

He considered Oncology as a war against cancer, which should use all the possible weapons : surgery, radiothe-

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rapy, polychemotherapy, immunotherapy and hormonotherapy. He had advocated and practiced polytherapy since the 1960 ies, as strongly as he advocated and practised translational medecine (ie the direct application of experimentation to clinical medicine). He also never forgot that each patient is a unique individual to be treated as such, psychologically and medically, thus paving the way for theranostics which adapts therapy to individual cases.

In the 1980 ies, Georges Mathé worked on AIDS and developed an efficient polytherapy which was aimed at preventing resistance and secondary effects but the drugs which he used were not approved by the French Drug Agency because of their foreign character.

Georges Mathé was not only a researcher and therapist, but also a great organizer. In the 1960 ies, he played a major role in the creation and development of the ARC, the INSERM, the CIRC and the GECA which became the EORTC in 1967. In the 1970ies, together with Maurice Schneider, he created the SMIC which became the ESMO.

Georges Mathé was also a prolific writer who published over one thousand scientific articles, two dozens scientific books and a dozen vulgarization books both in French and in English. He created and edited several international publications such as "Medical Oncology and Tumor Pharmacotherapy" with Pr James Holland.

From the 1960ies to the 1990ies, his importance was internationally acknowledged and participated to colloquia, symposia and congresses where he shared with his peers the advancements which would ultimately enable Oncology to cure half of its patients. He was honored with some of the highest international awards such as the Cameron Prize, the Gold Medal of the CIBA Foundation, the Health Memorial Award, the Bred Prize, the International Award of Chemotherapy, the Gotlieb Memorial Award, the Cancer Leopold-Griffuel Award, the Medawar Prize ... etc.

He died in 2010, but his legacy lives on. His holistic vision for translational and personalized polytherapy against Cancer has taken shape.