

## Jean Dausset a scientific pioneer: intuition and creativity for the patients (1916–2009)

Jean Dausset, a forward-looking and conscientious pioneer.

«I had the opportunity to be in the most exciting adventure of modern biology, deciphering a new world, the world of the intercellular language” in immunology (Jean Dausset, Collège de France, first lesson, 28<sup>th</sup> of April, 1978).

In a deserted laboratory, with only a table, a microscope, some slides and a refrigerator in the corner, Jean Dausset tried to understand why some patients had a leukopenia. He applied methods similar to those for hemolytic anemia on leucocytes, and using an antiglobulin obtained no agglutination. Why did he take a sample of serum from a patient receiving multiple transfusions and test it directly on white blood cells from another individual? Nobody knows. A splendid agglutination of white blood cells appeared. This experiment, performed in 1952, was the starting point of the long adventure which led to the Nobel Prize in 1980.

His life is a lesson for all those who wish to discover the secrets of Nature and use that knowledge for the benefit of patients.

Jean Dausset was born the 19<sup>th</sup> of October, 1916 in Toulouse. His father, a rheumatologist, had sent his family there during the First World War. Then, when he was 11 years old, his family came to settle permanently in Paris.

Immediately after his success in the competitive examination for the Internat des Hôpitaux de Paris, he joined the fighting forces in North Africa and performed blood transfusions in the army. On his return in 1944, he worked at the Regional Blood Transfusion Center in Paris developing the concept of exchange transfusion of new-born babies to women who had septicemia due to Clostridium Perfringens after abortion in order to avoid kidney failure.

On his return from a post doctoral year in Boston, he became interested in the *new immune-hematology techniques* applied on red blood cells (Coombs test) and decided to transpose the methods to white blood cells in cases of leucopenia. No reaction was found using antiglobulins. By chance, he took a serum of a poly-

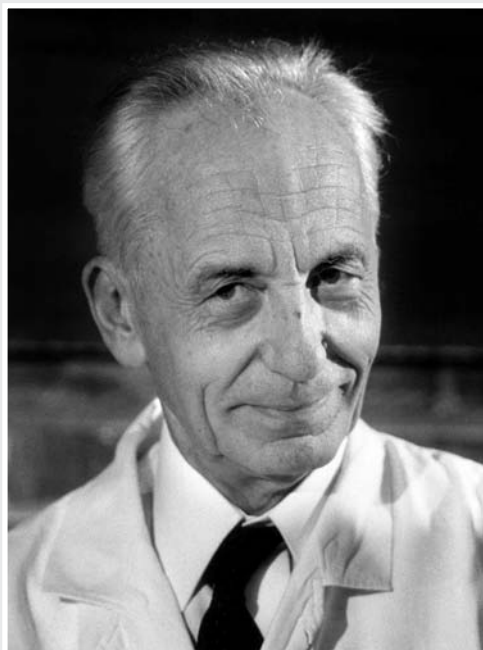
transfused patient which had remained in the fridge and was surprised to find a clear agglutination when he mixed it with white blood cells from another individual. He moved from autoimmune reactions to alloimmune reactions and carried out his experiments using serums from recipients receiving multiple blood transfusions from the same donor. In 1958, Jean Dausset described the first leukocyte antigen MAC (which is today HA-A2) from the results of the *leucoagglutination* technique applied on white blood cells of a panel of individuals. In his princeps article *Isoleuco anticorps* of Acta Hematologica (written in French) he considered the role of these antigens for organ and tissue transplantation.

During the same period, he participated actively with Robert Debré in the radical reform of the French University Hospitals, establishing full time employment and introducing Professors of Basic Sciences who were given hospital responsibilities. This reform led to a soar in French biology and brought a new lease of life to French medical research.

Despite the administrative struggles which ensued during this period, he never abandoned his laboratory work. In 1958, he took up the position of Assistant Professor of Hematology. He became Professor of Hematology in 1963 and was appointed Head of the Immunology Department at Hôpital Saint Louis.

He devoted his time mainly to research. Analyzing reactions of fifty serums on fifty individuals, he demonstrated the existence of a unique system comparable to the H2 system of mouse, which he named Hu-1, later renamed HLA for Human Leukocyte Antigens. Thanks to admirable volunteer blood donors, skin donors and skin recipients, grafted under the care of Professor Felix T. Rappaport from New York (who came periodically to Paris for this purpose), correlations were established between graft survival and tissue incompatibility opening the door to organ transplantation.

Besides the consequences of the discovery of the Major Histocompatibility Complex (MHC) in transplantation (mainly in bone marrow graft), in the prediction of susceptibility to disease (such as ankylosing spondylitis associated to HLA-B27), in population genetics (genetic distances and population migrations), his major contribution was in the new field of cellular immunology. Such a complex was not invented by Nature to fight against the surgeons trying to transplant an organ. No, in fact, the MHC has a central role in cel-



lular immunology presenting antigens either to CD4 T lymphocytes (HLA class 2) or to CD8 T lymphocytes (HLA class 1). Cellular immunology and the intercellular language was developed with the discovery of the MHC.

Jean Dausset took part in the creation of the Research Institute of Blood Diseases in Hôpital Saint Louis, directed by Jean Bernard. One of the departments under his direction was the research unit on transplantation immunology, the famous INSERM U93 of which he was director from 1968 and where several foreign and French collaborators actively worked. I had the honor of taking over the research unit in 1983 when Jean Dausset created a research institute for human polymorphism (CEPH), thanks to a bequest from Mrs Helen Avani. At the CEPH, he established an intensive international collaboration to create a genetic map of human genome. This material was and is still available to the scientific community; Jean Dausset fighting against the patents of human genes.

In 1977 he was appointed to a position held by Claude Bernard in the College de France but his research laboratory remained at Hôpital Saint Louis.

He was awarded the Nobel Prize in 1980 with George Snell and Baruj Benacerraf.

Jean Dausset also had a passion for modern plastic art, a hidden part of his personality. He had a shop in Rue du Dragon in Paris after the end of the war where the surrealists, painters, writers, and others, met together. Jean Dausset had an exceptional eye for discovering talented modern painters.

Intuitive and pragmatic, forward-looking and constructive, between basic and translational sciences, between medicine and biology, between the discovery and the responsibility of the scientist, between sciences and art, Jean Dausset combined contrasting features to make a harmonized world.

Jean Dausset died the 6<sup>th</sup> of June 2009 in Palma de Mallorca, Spain, surrounded by his family. He leaves us his testimony of the permanent search for the secrets of the hidden world as well as for the beauty of the real world.

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