Brigitte Askonas

(1923–2013)

The ‘grand dame’ of immunology.

Brigitte Askonas, widely known among immunologists as Ita, helped to establish many of the basic mechanisms and components behind the immune response to infection.

Askonas, who died on 9 January, was born in Vienna in 1923 to Czech parents. Her family left Austria in 1938 and settled in Canada in 1940. Educated at McGill University in Montreal, she moved to the United Kingdom in the late 1940s to do a PhD in biochemistry at the University of Cambridge. Then, in 1952, she obtained a staff position in the biochemistry division at the National Institute for Medical Research (NIMR) in Mill Hill, London, to study how milk proteins are made.

To quote Askonas, “the sticky nature of casein, the main milk protein, made it very difficult to purify any of the other milk proteins”. Soon after Askonas joined the NIMR, immunologist John Humphrey demonstrated in a seminar how adding purified antigen to blood serum caused antibodies in the serum to precipitate (antigens are foreign substances that prompt the production of neutralizing proteins or antibodies in the body). Askonas was intrigued and soon turned her attention to the immune system.

In the mid-1950s, Askonas started studying the assembly and secretion of antibody molecules in animals that had received injections of antigens. By 1957, immunology had progressed so much at the NIMR that Humphrey was asked to set up the first immunology division. He invited Askonas to become a founding member. The research effort expanded further after immunologist Peter Medawar became director of the NIMR in 1962. In the early 1960s, the institute became a worldwide centre of immunology research, with Askonas playing a central part — both as a pioneering researcher and as a shaper of the futures of the many young scientists who worked with her.

After studying the assembly and secretion of antibodies — also known as immunoglobulins, which are found throughout the body, including in serum and saliva — Askonas focused on the behaviour of B cells, a type of white blood cell that produces antibodies.

In particular, she looked at which antibodies were produced after different antigens were administered to animals. She established that B cell clones producing particular antibodies rapidly dominated specific neutralizing responses.

In the 1960s, very little was known about how the immune system handles antigens. Askonas discovered that antigens were taken up and partially degraded by macrophages (another type of white blood cell) with a small amount of antigen being retained by the cells. In the late 1960s, Humphrey invited immunologist Emil Unanue to join the NIMR. Working with Askonas, Unanue showed that those macrophages that had retained remnants of antigen could very efficiently induce the production of neutralizing antibodies by B cells, providing the first findings in the nascent field of antigen processing and presentation.

In 1973, Askonas was elected a Fellow of the Royal Society. Three years later, she became head of the Division of Immunology at the NIMR. At this point she began her seminal work on the immune response to infectious agents, moving away from the ‘model antigens’ — extracted for example from chicken eggs — that were heavily studied at the time.

In the mid-1970s, Askonas and several colleagues, including her close friend Bridget Ogilvie, studied how trypanosomes, the protozoa that cause African sleeping sickness,

inhibit and evade the immune response. However, Askonas’s greatest interest became immune responses to viruses mediated by white blood cells called T cells. She focused mostly on influenza, and later also studied respiratory syncytial virus, which particularly afflicts infants.

Cytotoxic T lymphocytes are T cells that kill virally infected cells. Among the first to isolate and clone this type of T cell, Askonas and her colleagues showed that, unexpectedly, the T cells did not distinguish between influenza-virus variants within a serotype. These studies paved the way to understanding viral antigen presentation to T cells. (Her PhD student Alain Townsend went on to make several key findings.)

Askonas’s immense contributions to immunology were recognized by numerous awards and honours. In 2007, for example, she was elected a foreign associate of the US National Academy of Sciences. Last year, at the age of 89, she received an honorary doctorate from the University of Cambridge for achieving the greatest international prominence in her field.

It is impossible to list all the collaborators and trainees worldwide who benefited from Ita’s sharp mind and generosity. She was passionate about introducing young scientists to immunology and worked hard to support students from many countries, especially in the developing world. Many of the PhD students and postdocs she trained are now eminent scientists. She also trained many physicians in experimental immunology.

Ita remained inquisitive throughout. Culture and arts were deeply embedded in her family, and although a scientist through and through, she loved music and art, attending operas and art galleries with her numerous scientific friends. Over the years, she always made time to critically read drafts of papers and grant applications from many scientists, both young and old. She continued to contribute to many studies after her retirement as head of the NIMR immunology division, although she rarely accepted co-authorship.

It is difficult for immunologists to think of a world without Ita. We will miss her — as a force in immunology and as a dear friend. ■

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