

OCTOBER 2021 SPEAKER

DR. TAK WAH MAK, INTERNATIONAL LEADER IN CANCER IMMUNOLOGY RESEARCH

“HOW THE IMMUNE SYSTEM ‘THINKS’”

We were greatly honoured to have Dr. Mak, world renowned for his pioneering work in the genetics of immunology and the interconnection between the brain and the immune system, as our guest speaker on “Education Night,” October 25. Dr. Mak currently is Senior Scientist, University Health Network and Professor, University of Toronto. He has published 950 papers, received over thirty-five national and international awards, and is an Officer of the Order of Canada. He is a leader in the development of immunotherapy to tackle cancer, internationally acclaimed for his cloning of the “T Cell Receptor” in 1984 which has led to a substantial decline in fatal leukaemia, once a leading cancer killer. “Immunotherapy has become the fourth pillar of cancer treatment,” he said. (The others: surgery, chemotherapy, radiation)

Dr. Mak came across as totally dedicated, pleasant, unpretentious, wryly humorous, and willing to share credit with his “collaborators” rather than hog the limelight as some science “stars” do. As it was Education Night, he advised: “Education shouldn’t be just regurgitation. Intuition and feeling are important. As Allen Curnow, a noted twentieth century poet, wrote: ‘By simply sailing in a new direction you could enlarge the world.’”

The immune system is responsible for finding and killing both infected and cancer cells. “The brain tells the immune system when to kick in,” Dr. Mak said. “A key component is the ‘helper’ T (for Thymus) cell, a type of white blood cell. “He was the first to isolate the human gene that encodes one of the proteins in the T Cell Receptor (TCR) complex. It was a life-saving discovery, leading to the development of “CAR-T cell immunotherapy” - engineering T cells to produce a custom TCR directed against an Antigen, a specific piece of a virus or tumour produced by a cancer cell, growing these T cells in large quantities in the laboratory, and then introducing them back into the body via an intravenous needle to fight the cancer. Dr. Mak compared it to how the “Trojan Horse” in Greek mythology was used by the Greeks to infiltrate and defeat the enemy Trojans.

Dr. Mak also explained the interconnection between the brain and the nervous system. There are both “Sympathetic” – “fight or flight”- and “Parasympathetic” – “rest and digest” components, which balance each other by having opposite effects. For example, the sympathetic system dilates eye pupils and accelerates heartbeat in times of stress, whereas the parasympathetic system contracts the pupils and slows down the heartbeat as the stress resolves.

Asked whether exercise helps to reduce stress and improve immune system function, as a recent newspaper article has claimed, Dr. Mak smilingly replied, “I have no idea. There is, as far as I know, no good scientific basis for declaring so yet. A good diet contains lots of choline which is critical for making ACh, so that definitely helps the immune system.” Choline, described as similar to B vitamins and considered an essential nutrient for brain and body health, is found in a wide variety of foods including vegetables, meat, fish, and eggs.

Susan Goldenberg