

Irene Uchida

Irene Uchida didn't set out to be a scientist. She was studying English literature at UBC, before she was interned with other Canadians of Japanese heritage during WWII. Born to Japanese immigrant parents in Vancouver in 1917, young Ayako Uchida was dubbed "Irene" by her piano teacher who struggled to pronounce her name, which means "splendid" in Japanese. Her father owned two Japanese bookstores in Vancouver, and young Ayako loved reading and music, playing organ, piano, and violin for the United Church. She faced tragedy in her youth, first when her best friend Marion Gross was killed in a traffic accident; she wore her ring for the rest of her life. Then her sister Sachi died of tuberculosis, even after her mother brought her to Japan where she felt she would receive better medical care. These tragic experiences left Irene with a desire to help people.

While at UBC, she was a reporter for weekly Japanese-Canadian newspaper *The New Canadian*, and was active in the group Japanese Canadian Citizens for Democracy. In 1940, she and her sister Kazuko went to Japan to visit her mother and sister Junko who were living there. She chose to leave via what proved to be the last ship to Canada out of Yokohama before the outbreak of war. Her mother and sisters were trapped in a bleak Tokyo with shortages and war rationing and remained there for years. She, her father, brother, sister-in-law, and their kids were all placed in internment camps in the Rockies in the BC interior, initially together at Christina Lake. Because of her university education, her friend Hide Hyodo, Supervisor for Education for the internment camps, asked for her help. She moved to the nearby Lemon Creek camp, where she set up a school for 500 children and became its dedicated principal, turning her own shack into a library where students could study. Arriving in winter, their first task to avoid freezing to death was to patch gaps where snow and wind breached building walls.

After the war, the United Church gave her the opportunity to complete her degree at the University of Toronto. It's worth noting that after the war and until 1949, the only Japanese Canadians allowed back in Toronto were university students. Overt racism in the post-war years was not rare. Her father had returned to Japan with the repatriation program in exchange for Allied prisoners of war. Her family's bookstores and other assets had been seized and she had nothing left for her in British Columbia. She made money washing dishes and sewing in a factory on Spadina, when not in class. She apparently made enemies

in her fellow seamstresses who complained she made them look bad by sewing a zipper into a woman's skirt faster than anyone, and she was fired.

She completed her BA at U of T in 1946. She planned to pursue a master's in social work, but zoology professor, and soon to be director of the Department of Genetics at the Hospital for Sick Children in Toronto, Dr. Norma Ford Walker recognized her talent in an introductory genetics class and recruited her for grad school. Uchida took all her other introductory science courses while in graduate school and got her doctorate in zoology in 1951! She began her research career at the Hospital for Sick Children in Toronto with Dr. Walker, studying twins with genetic diseases including congenital heart disease and Down syndrome. They set up one of the largest twin registries in North America, and working with pediatricians, Irene developed such good relations with the twin subjects that they gladly participated in all her studies and volunteered for others. She stayed there until 1959.

She spent a year working on *Drosophila* chromosomes with Dr. Klaus Patau (who later discovered the Patau syndrome, caused by trisomy 13 or extra genetic material from chromosome 13 in some or all cells, another example of nondisjunction like Down syndrome) at the University of Wisconsin. While there, Uchida learned that French researchers had linked Down syndrome to an excess chromosome (trisomy 21) - the first time a chromosome anomaly was shown as the cause of a human disorder. She decided to find out why people had this excess chromosome. Her work attracted the attention of Harry Medovy, a pediatrician at the Winnipeg Children's Hospital, who hired her.

She brought the skills honed studying fruit fly chromosomes to Canadian hospitals when she started the first cytology department in the country, and ran it for 9 years. She found extra chromosomes in babies who had birth defects. Diagnosing trisomy by actually looking directly at chromosomes in cells was a very new technique and she was the first to do this in Canada. Most importantly, she made scientific history when she traced chromosomal anomalies in offspring to mothers' prior exposure to abdominal x-rays. She compared a large number of children born to mothers before they had received diagnostic radiation to those conceived afterwards, and saw much more trisomy in those conceived afterwards. While this did not make her popular with radiologists, her research helped prevent life threatening or altering birth defects, and made her an internationally recognized geneticist. She was also amongst the scientists who discovered that the mother's genetic material was not always responsible for a

baby with Down syndrome, and that one quarter of births can be linked to the father. Since the occurrence of Down syndrome goes up with maternal age, it had been assumed it was linked solely to mothers.

She received a 1969 Medical Research Council grant to work as a visiting scientist at the University of London and in Harwell, England, to study a technique for analyzing the chromosomes of mouse eggs and sperm, again looking at the effects of radiation. Afterwards she was lured to McMaster University in Hamilton to work as a professor and Cytology lab director. She stayed there for 22 years, working closely with Dr. Viola Freeman, and continuing her research on the link between radiation and chromosomal anomalies, travelling around Ontario to gather samples from Down syndrome child patients and their parents. She also started a Genetic Counselling Program at the McMaster Medical Centre. Her last job was Director of Cytogenetics at the Oshawa General Hospital, 1991–1995. Since one of the X chromosomes is always naturally deactivated in female embryos, Uchida hoped that one day geneticists will learn to deactivate one of the chromosomes in an individual with trisomy (at 21, 13 or 18) and be able to cure them at an early embryonic stage; this sort of research is only just starting, decades after her hopeful prediction.

She was a world expert in Down syndrome, President of the American Society of Human Genetics, served on the Science Council of Canada, received honorary degrees from McMaster and Western universities, was named Woman of the Century 1867-1967 by the National Council of Jewish Women, in Manitoba, an Officer of the Order of Canada, had a lifelong love of language and grammar, and a wry sense of humour. Not a fan of public speaking to large groups of peers, she never turned down a chance to speak with children. She was a dedicated if exacting teacher and mentor to many graduate students and post-docs. She did not have a family of her own but was generous with her nieces, often taking them along on international travel. She was one of the people who fought tirelessly for reparations the 20,000 Japanese-Canadian internees, finally granted four decades later in 1988 when each of the survivors received \$21,000 and reinstatement of Canadian citizenship if they had been deported. She donated \$50,000 to the Winnipeg hospital for a biannual genetics lecture. She was fun if brusque, opinionated though humble, described as feisty and was known as a gracious hostess who believed the only drink worth having was a Glenfiddich single malt with one ice cube, and a truly extraordinary individual.