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Gertrude B. Elion

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GERTRUDE B. ELION:

The woman who described scientific research as organized play for adults. (9)

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CHE 203
Sonnichsen

BIOGRAPHY

Gertrude (Trudy) Belle Elion was born on January 23, 1918, in New York City, New York. She had one brother. Elion's father was a dentist, but came from a long line of rabbis. (7)

EDUCATION (6,7):

- Elion excelled in school, and graduated from high school when just fifteen. (6)
- Elion received her B.A. summa cum laude from Hunter College when she was nineteen, in 1937. Elion went back to school, attending New York University, and received her M.S. in 1941. (7)
- Although she started her Ph.D. work, she never finished it. (9)

WHY CHEMISTRY (6,7,9):

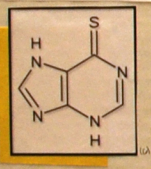
- She was driven by the death of her grandfather from stomach cancer. At that point had decided she wanted help with the fight against cancer. (6)
  "I had no specific bent toward science until my grandfather died of stomach cancer. I decided that nobody should suffer that much." (6)
- She had an aversion to animal dissection, so chemistry seemed like a logical field for what she wanted to accomplish. (9)
- During her time a NYU, Elion's fiancé died suddenly. After that loss she never got married. (7)

On Sunday, February 21, 1999, Gertrude Elion passed away where she lived in Chapel Hill, North Carolina. (7)

CONTRIBUTIONS

ANTICANCER (3,4):

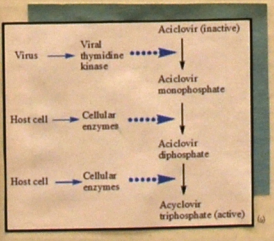
- Elion worked on an immunosuppressant called 6-mercaptopurine (6-MP). Brand name, Purinethol. (3)
- It is a purine analog. (3)
- The original use was for acute lymphoblastic leukemia.
- Now it is used for leukemia, non-Hodgkin's lymphoma, psoriatic arthritis, inflammatory bowel disease, among other things. (9)
- The drug inhibits nucleotide synthesis, or the making of new DNA and RNA. (4)



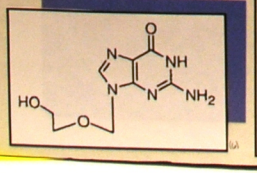
6-mercaptopurine

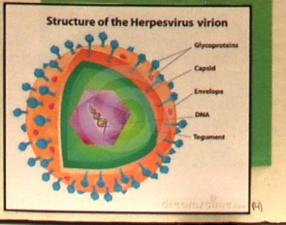
ANTIVIRALS (1,2,8):

- Elion primarily worked with acyclovir (Zovirax, Imavir, Zoral).
- It was originally used for the treatment of Herpes Simplex Virus (HSV). (4)
- Now it is used for HSV, chicken pox and shingles (Herpes Zoster Virus- HZV), and has shown to slow disease progression HIV patients. (5)
- Acyclovir is converted by viral thymidine kinase to a monophosphate form. That is then converted to a di- and finally a triphosphate form that inhibits the synthesis of the viral DNA. (1)
- Acyclovir is a very specific drug, and does not harm normal cells. (4)



Acyclovir

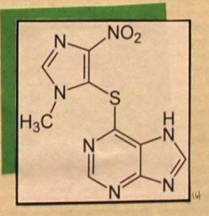




ORGAN TRANSPLANT (3,4):

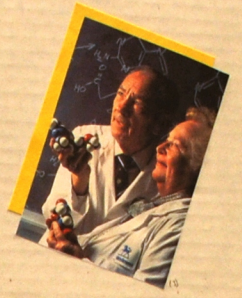
- Another drug Elion worked on is Azathioprine.
- It is also a purine analog, and a prodrug of 6-MP. (3)
- Its original use was to aid in organ transplant. (4)
- Today Azathioprine is also used for autoimmune diseases. (8)
- This drugs affects the T cells and B cells of the immune system by inhibiting the enzyme they need to synthesize their DNA. (4)(7)

Azathioprine



NOBEL PRIZE

In 1988, Gertrude Elion, George H. Hitchings and Sir James W. Black were awarded for their work in using purines to treat diseases chemotherapeutically with a Nobel Prize in Medicine. (6)

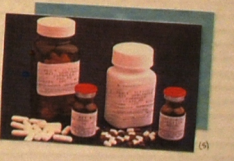


AWARDS, TITLES AND MEMBERSHIPS (6)

- The Garvan Medal from the American Chemical Society in 1968
- The Sloan-Kettering Institute Judd Award 1983
- The American Association of Cancer Research Cain Award and the American Chemical Society Distinguished Chemist Award in 1985
- The American Cancer Society Medal of Honor in 1990
- The National Medal of Science in 1991
- Member of the National Academy of Pharmaceutical Scientists and the American Chemical Society
- Member of the American Association of Cancer Research, as well as the president from 1983-1984
- Boards member of the National Cancer Institute
- Board member for the American Cancer Society
- Board member for the Multiple Sclerosis Society
- Received the National Medal of Science
- First women to be inducted into the National Inventors Hall of Fame in 1991
- Earned the Lemelson-MIT Lifetime Achievement Award in 1997
- She received twenty honorary doctoral degrees

CONCLUSION

In 1988, Gertrude Elion, George H. Hitchings and Sir James W. Black were rewarded for their work in using purines to treat diseases chemotherapeutically with a Nobel Prize in Medicine (3). This award linked together the work Elion had been doing for most of her career. She set out to make a difference in people's lives through the development of treatments for diseases that plagued people on a daily basis. She made many breakthroughs in the chemical and medical fields including her contributions of anticancer, immunosuppressant and antiviral medications.



"The Nobel Prize is fine, but the drugs I've developed are rewards in themselves." (5)

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