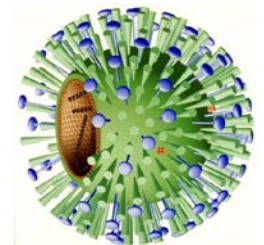


# EPIGENETICS OF INFLUENZA VIRUS INFECTIONS



İkbal Agah İNCE



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# What is Epigenetics?

The term epigenetics refers to heritable changes in gene expression (active versus inactive genes) that does not involve changes to the underlying DNA sequence; a change in phenotype without a change in genotype.

*Our genetic code is not Destiny !  
The discoveries in epigenetics may rewrite  
the rules of disease, heredity, and identity*

# Influenza A virus (IAV)

Annual influenza epidemics cause 3-5 million cases of severe illness and 250-500 thousand deaths every year around the world in human population and important losses in the poultry industry.

Most notorious Influenza H1N1 pandemics was the Spanish flu which killed millions of people in 1918-1920.

More recent outbreaks were an avian strain H5N1 which caused Bird Flu in 2004. The novel flu strain H1N1 which caused Swine Flu in 2009, which evolved from combined genes from human, pig, and bird flu. Both viruses can transfer from animal to human, but do not spread easily between humans yet.



# PROJECT - Rationale and Objectives

Understanding of epigenetic mechanisms in relation to infection diseases is crucial before any disease prediction, prevention and effective drug design strategies.

Influenza viruses are masters at circumventing their hosts' defenses. They co-opt cellular protein-synthesis pathways to produce viral proteins. By hijacking this regulatory machinery, the virus inhibits the cell's production of antiviral proteins.

# Research Questions

- 1- Does an influenza virus infected cell or an infected host retain, acquire or modulate epigenetic markers?
- 2- How does the epigenetic status effect the host cell sensitivity to infection?
- 3- Are there certain epigenetic modifications induced by infection which are essential to virus replication?
- 4- Do these modifications reveal protection markers which can be blocked to protect the cells?

