# Fighting the Enemy Within

## Basic Life Science and Issues : Presentation

Group 4

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# Chapter Abstraction

**Fighting the Enemy Within**

11th chapter of *The Epigenetics Revolution*

*”Epigenetic perspective of Cancer and its treatment”*

# Introduction: Cancer

Healthy cells, have two types of genes:

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- tumor suppressor genes for regulation

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# Epigenetic Approach for Oncogenesis

- DNA Methylation

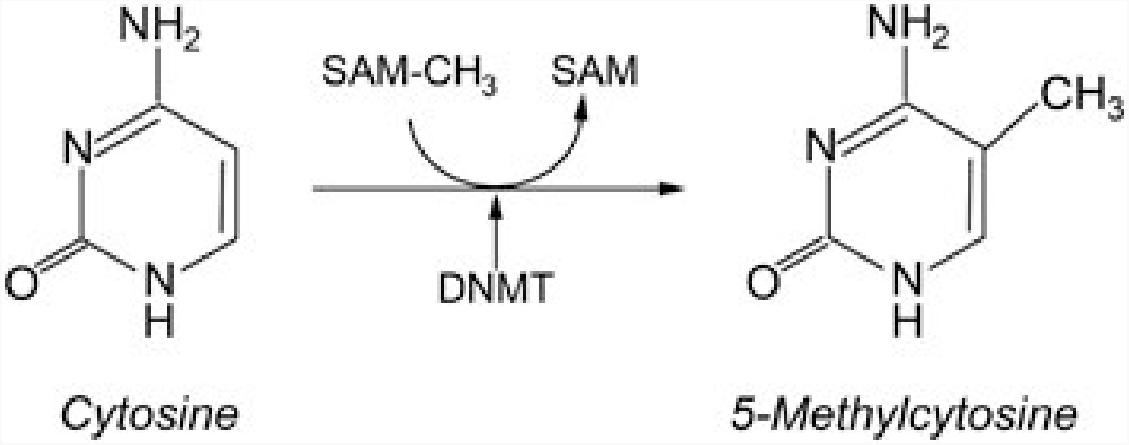
  Hypermethylation of CpG island

- Repressive Histone Modification

  Histone deacetylation

# DNA Methylation

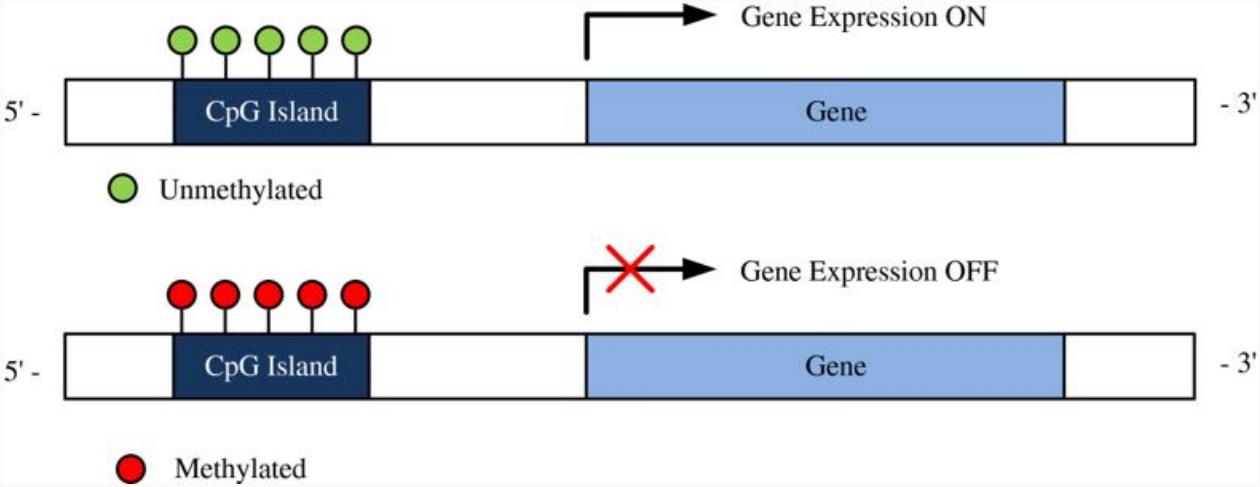
Cytosine before Guanine can be methylated




Methyl group is bond on 5’ carbon atom

# DNA Methylation

CpG dinuclotide cluster (CpG island, CGI) are usually located in the promoter regions of genes in a DNA sequence.




Hypermethylated CGI disables specific gene expression.

# Histone deacetylation

# Characteristics of Oncogenesis

- Multi-step process
- Defections must be accumulated

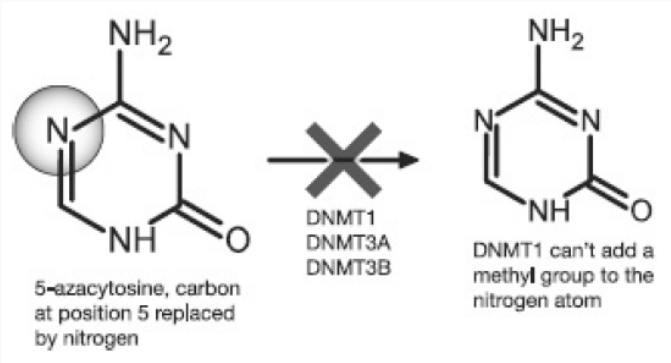
  Inherited oncogenes are slowly expressed
  e.g.) BRCA1 mutation

- Tumour suppressor gene - Switched off
- Alteration with epigenetic access

# Approach for Treatment

- DNMT enzyme inhibitors

  5-azacytidine, 2-aza-5'-deoxycytidine




methylation inhibited by 5-azacytidine

# Approach for Treatment

- HDAC inhibitor

  SAHA, Romidepsin

# No easy wins

- Oncogenesis has numorous mechanisms

  Case by case, person by person

- The solutions are preferrable for haematological cancer
- Also these solutions should be used in different fields

  DMNT inhibitors for bone marrow, HDAC inhibitors for T-cell lymphoma

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# Alternative Approach

# Conclusion

# References

[1] Carey, N. (2012). *The Epigenetics Revolution*. Columbia University Press

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[3] Kazantsev, Aleksey G; et al. (2008). *Therapeutic application of histone deacetylase inhibitors for central nervous system disorders*, Nature Reviews. Drug Discovery  London Vol. 7 Iss. 10  854-68.

# Q & A

Thank you!