

Fighting the Enemy Within

Basic Life Science and Issues : Presentation

Group 4

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Fighting the Enemy Within

11th chapter of *The Epigenetics Revolution*

"Epigenetic perspective of Cancer and its treatment"



Healthy cells, have two types of genes:

- proto-oncogenes for cell proliferation
- tumor suppressor genes for regulation



Introduction: Cancer

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However, cancer cells lost balance of these, For example,

- proto-oncogenes is over-activated
- tumor suppressor genes is inactivated



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Epigenetic Approach for Oncogenesis

- DNA Methylation

Hypermethylation of CpG island

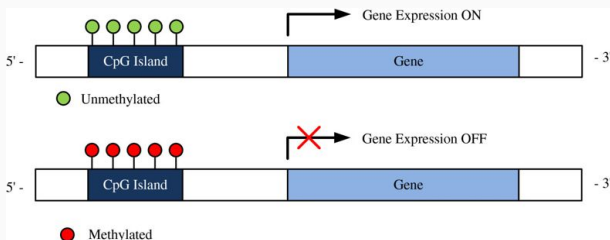
- Repressive Histone Modification

Histone deacetylation



CpG Hypermethylation

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



Densed methylation for CGI disables specific gene expression.

Histone deacetylation



Approach for Treatment



No easy wins



Alternative Approach



Conclusion



References

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- [2] Kakumani, R.; et al. (2012). *Identification of CpG islands in DNA sequences using statistically optimal null filters*, EURASIP Journal on Bioinformatics and Systems Biology
- [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!