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Journal of Next Generation: Sequencing & Applications

Review in 3 weeks Publishing in 72 hours Open Access

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Biography

- **Dr. Luo** been studying molecular pathology related to human malignancies in the last 23 years. Currently, he is a Professor of Pathology and Director of High Throughput Genome Center at University of Pittsburgh.
- In the last 13 years, Dr. Luo has been largely focusing on genetic and molecular mechanism of human prostate and hepatocellular carcinomas. In this period, his group has identified and characterized several genes that are related to prostate cancer and hepatocellular carcinoma, including SAPC, myopodin, CSR1, GPx3, ITGA7, MCM7, MT1h and GPC3.
- He is one of the pioneers in utilizing high throughput gene expression and genome analyses to analyze field effects in prostate cancer and liver cancer. He is also the first in using methylation array and whole genome methylation sequencing to analyze prostate cancer.

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Research Interest

- Has research interests to identify new tumor suppressor genes, oncogenes and tumor markers in prostate cancer and hepatocellular carcinoma using high throughput and comprehensive analyses. Subsequently, we will direct our effort to evaluate the prognostic values of these genes and markers in making early diagnosis of these malignancies and serving as drug targets for cancer prevention program.
- As the Director of High Throughput Genome Center, I have collaborated extensively with faculty members in the UPMC and University campuses to use high throughput genome sequencing and high throughput microarray analyses to develop tests for molecular pathology and to investigate novel mechanisms for signal transduction and identifying markers for human diseases.

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Introduction

What are tumor suppressor genes?

- Repression of genes that are essential for the *continuing* of the cell cycle.
- Coupling the cell cycle to DNA damage. As long as there is damaged DNA in the cell, it should not divide.
- If the damage *cannot* be repaired, the cell should initiate apoptosis (programmed cell death)
- Some proteins involved in cell adhesion prevent tumor cells from dispersing, block loss of contact inhibition, and inhibit metastasis. These proteins are known as metastasis suppressors

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Categories of Tumour Supressor Gene

- Caretaker Gene:
  - Maintain the integrity of the genome by repairing DNA damage
- GatekeeperGene
  - Inhibit the proliferation the death of the cells with damaged DNA.

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Tumor protein p53

- Known as **p53**, **cellular tumor antigen p53**, **phosphoprotein p53**, or **tumor suppressor p53**, is a protein which encoded by the *TP53* gene.
- Located at the short arm of chromosome17.
- It can activate the DNA repair protein when DNA sustains damage.
- regulates the cell cycle and, thus, functions as a tumor suppressor, preventing cancer. As such, p53 has been described as "the guardian of the genome" because of its role in conserving stability by preventing genome mutation.[

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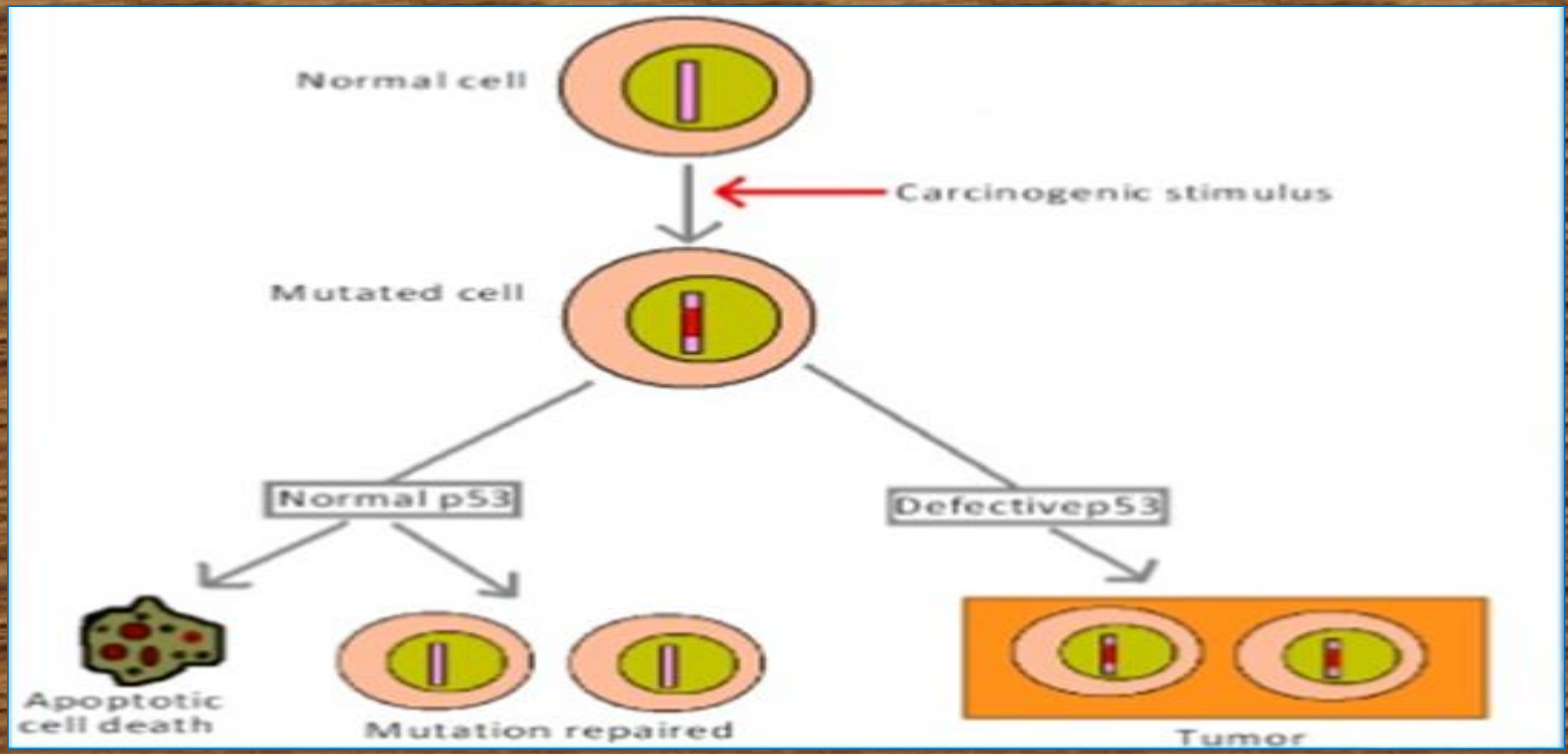
Role of p53 in cells with damaged DNA



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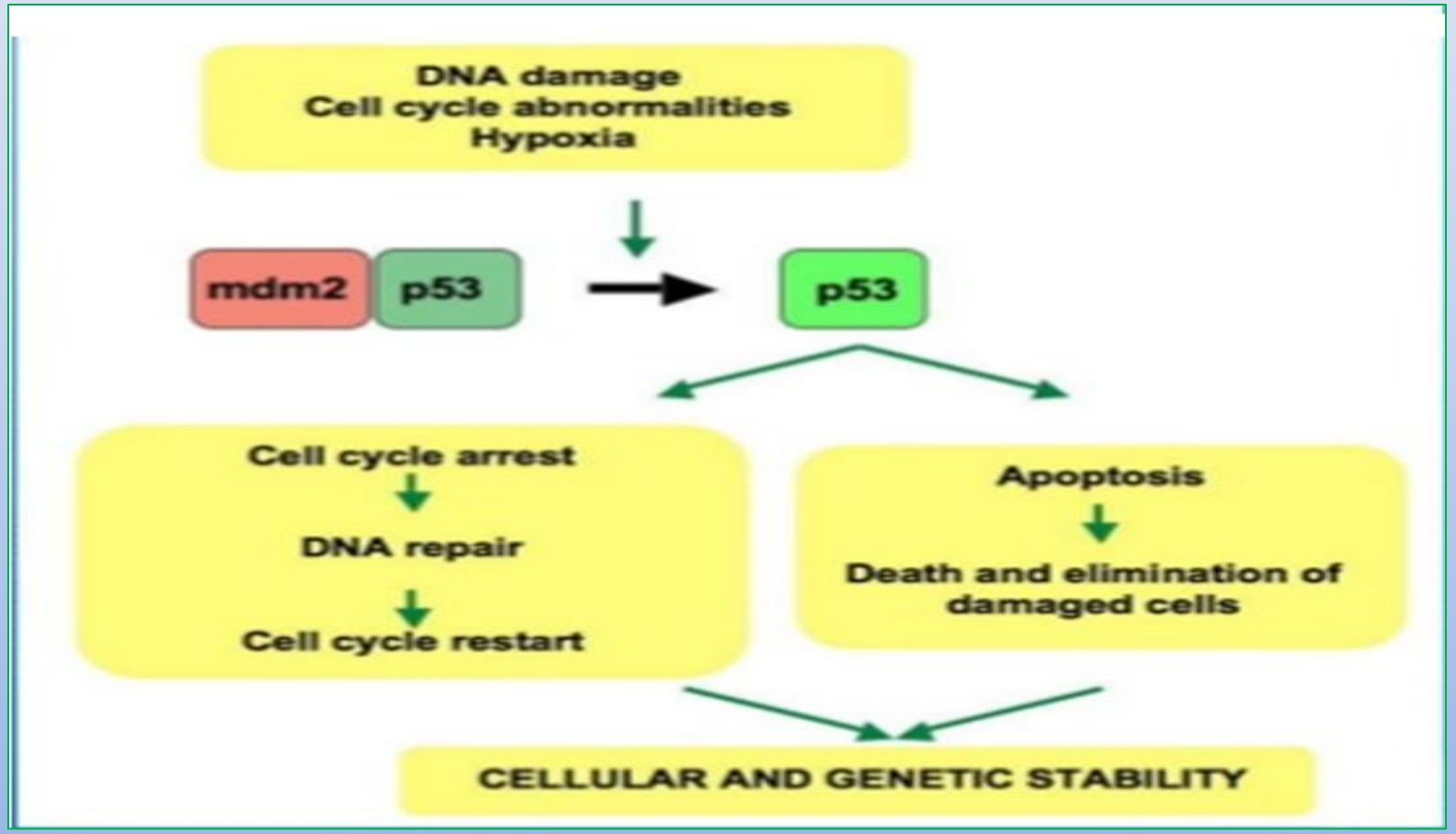
Role of p53 gene



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Other Supressor Gene

- APC Gene
- WT-1
- NF-1
- Von Hippel- lindau Gene
- P15 & P16
- BRCA1 & BRCA2
- P10 gene

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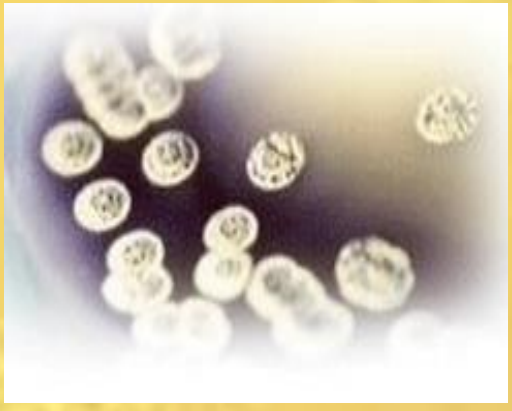
- Transcriptomics: Open Access



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