ANALYSIS OF TUMOR SUPPRESSOR GENE EXPRESSION IN TUMORAL AND NON-TUMORAL CELLS

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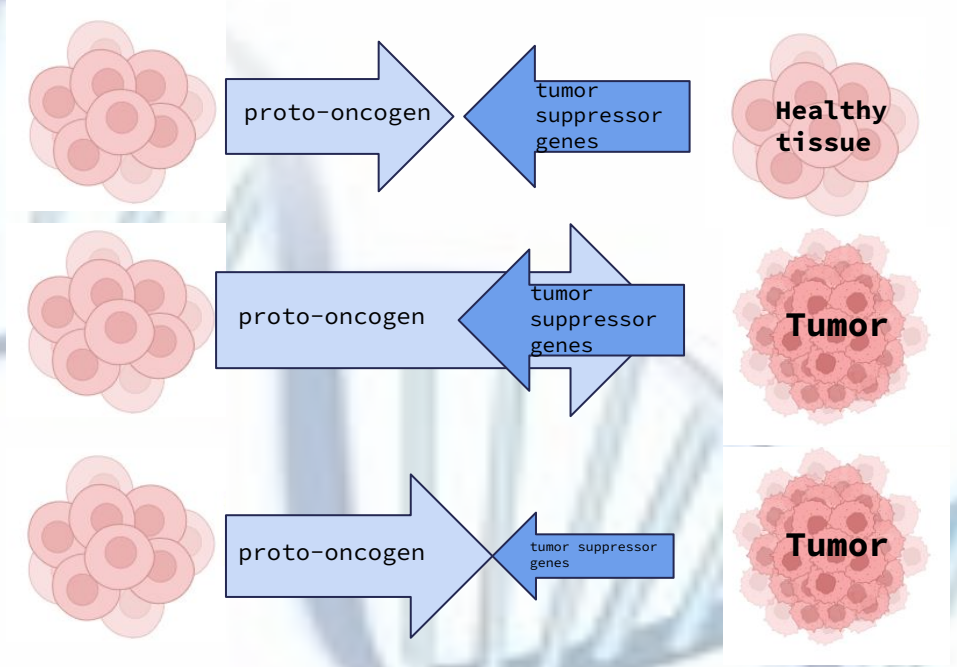
CONTENTS

Introduction

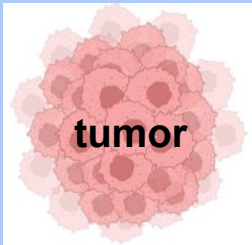
Cancer is caused by uncontrolled cell growth. This process is regulated by two types of genes:

Proto-oncogenes (push cell growth) and tumor suppressor genes (slow down to regulate them)



Objectives

- Obtain RNA from cell pellets.
- Obtain copy DNA from RNA.
- Amplify by PCR (polymerase chain reaction) a control gene and a tumor suppressor gene.
- Observe the results of the PCR in an agarose gel.
- With all this, we want to study the expression of a tumour suppressor gene in healthy cells and tumour cells.
- Interpret, discuss and represent the results of the project and the most relevant conclusions.

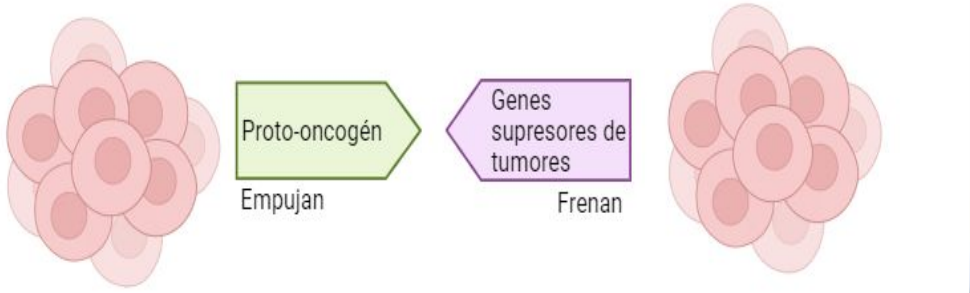


HYPOTHESIS

The tumor suppressor gene will be expressed in healthy cells, but won’t be expressed in tumor cells.

BASIC CONCEPTS

GEN:are segments of deoxyribonucleic acid (DNA) that contain information for a specific protein.



GEN SUPPRESSOR: encodes a protein that acts as a regulator in cell division, keeping it under control.

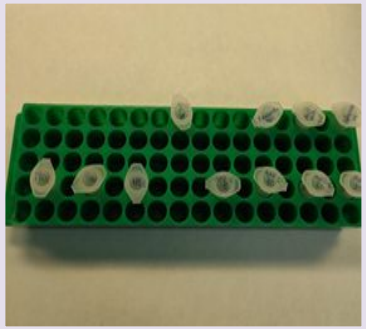
PROTO-ONCOGEN: genes whose expression is related to the development of the tumor.

MATERIALS

EPPENDORF TUBE

MICROPIPETTE

PIPETTE TIPS

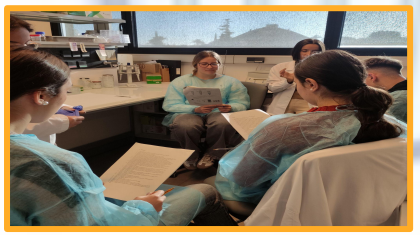


TEST TUBE RACK

CENTRIFUGE

MATERIALS AND METHODS

1st SESSION



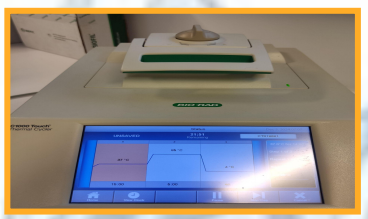
Presentation of the **theoretical background** and facilities by the researchers. Familiarization with **laboratory materials and apparatus.**

MATERIALS AND METHODS

2nd SESSION

1. Obtaining **RNA** from **cell pellets** using a commercial kit.

2. Measurement of RNA concentration in **Nanodrop.**



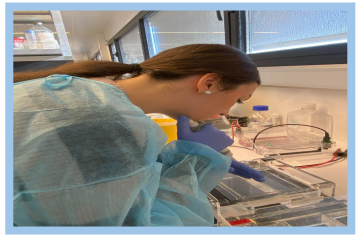
3. Obtaining **copy DNA** by **retrotranscription.**

4. **PCR** amplification of the problem gene and tumor suppressor gene.

MATERIALS AND METHODS

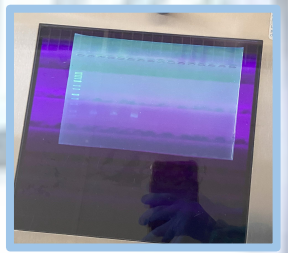
3rd SESSION

1. Making an **agarose gel**



2. Loading **samples** into **gel wells**.

3. Observation of **results** in a transilluminator.



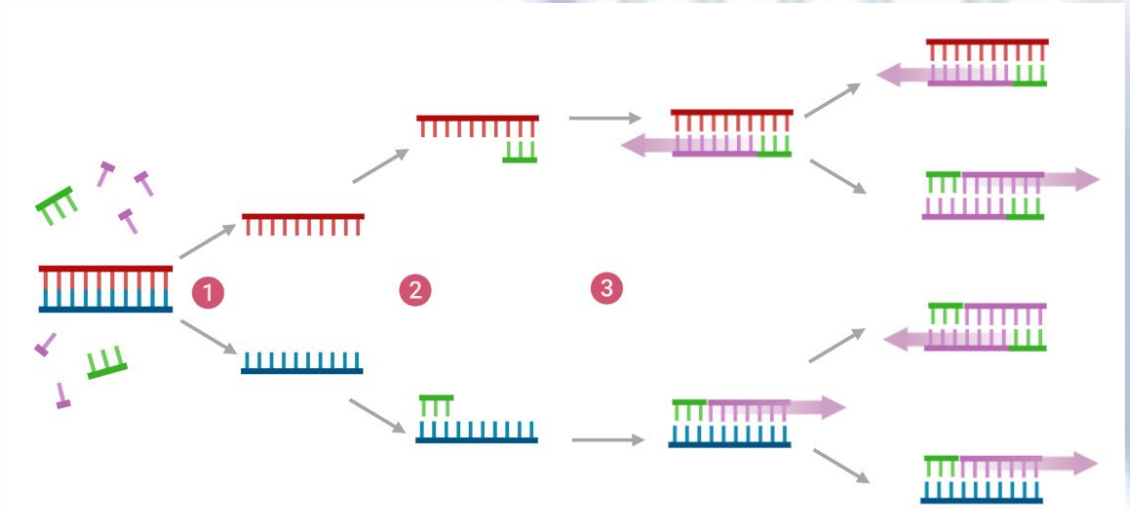
MATERIALS AND METHODS

4thSESSION

Advice on the development of a scientific poster.

MATERIALS & METHODS

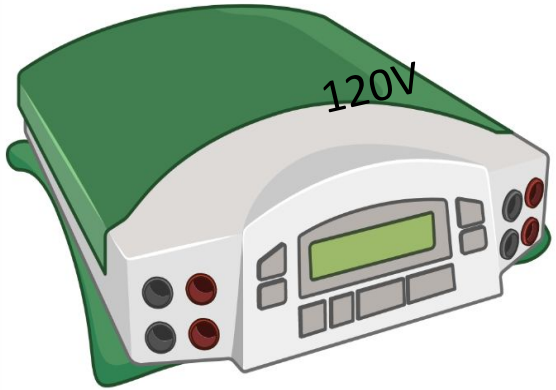
1. DNA amplification by PCR

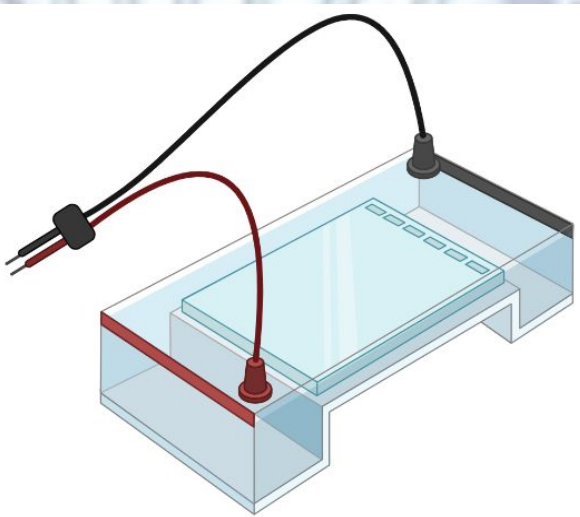


Materials used:
- Pipettes
- Termocycler

MATERIALS & METHODS

2. Electrophoresis in agarose gel



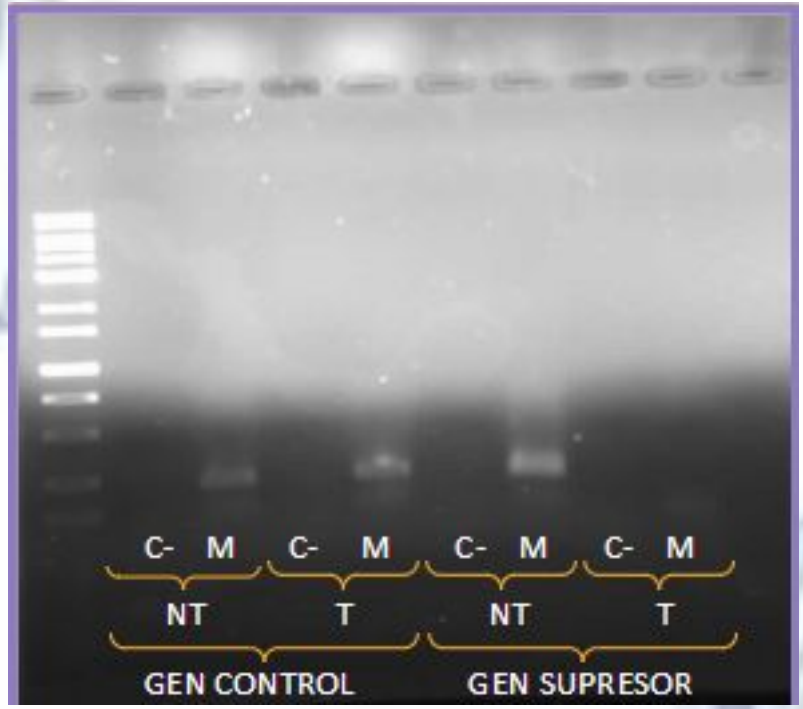


Materials used:

- Pipettes
- Transilluminator with UV light

RESULTS

- There is **no amplification** in the **negative control** in both samples.
- There is **amplification** in the **control gene** in both samples.
- There is **amplification** in the tumor suppressor gene in the non-tumor line sample, but none in the tumor line sample.



CONCLUSIONS

- The **RNA** obtained has a sufficient **concentration and quality** to be used as a **template** for obtaining the copy DNA.
- **PCR** has been developed **correctly** for the **control gene**, as expression is observed in both healthy and tumour cells.
- **Negative controls** for the control gene and for the suppressor gene are **not expressed**, so we consider the results adequate.
- **The tumor suppressor gene studied is expressed in healthy cells but is not expressed in tumor cells.**

Acknowledgements

- To the Genetic department (University of Córdoba) and the GC22-Epigenetic laboratory (IMIBIC)
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- To the Educational Innovation Programme Fidiciencia 3.0
- To the Erasmus+ Programme
- To our parents and families

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THANK YOU FOR YOUR ATTENTION