



UNIVERSIDAD
NACIONAL
DE COLOMBIA



Oscar Julián Murillo Torres

Master of Biochemistry (Research)

**Dolly Patricia Pardo Mora, Mauricio Rey Buitrago and Orlando Alfredo
Torres García**

**Faculty of Medicine
Genetics Institute
National University of Colombia**

**Faculty of Veterinary Medicine
Antonio Nariño University**



**COLOMBIAN PROPOLIS WITH
BIOLOGICAL POTENTIAL:
ANTITUMOR AND
IMMUNOMODULATORY
ACTION, *IN VITRO* ASSAY IN
OSTEOSARCOMA CELLS**





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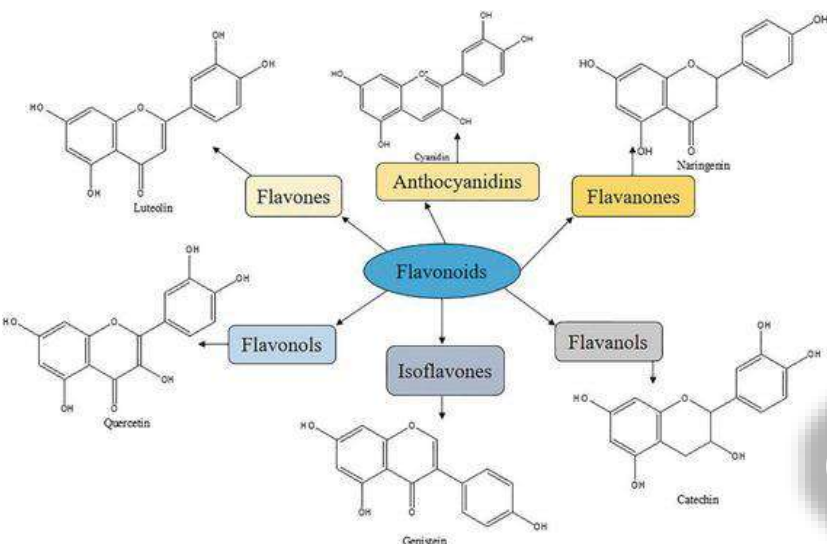
- 1) Background
- 2) Objective
- 3) Materials and methods
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- 5) Conclusion

1) BACKGROUND

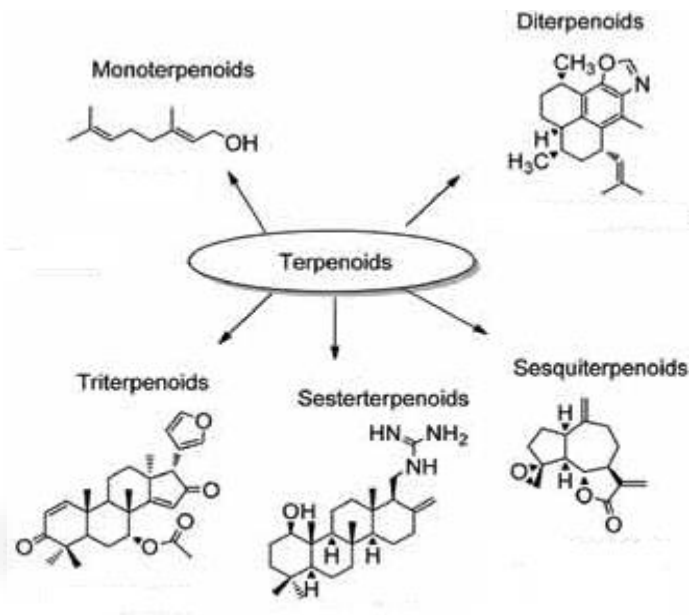


1) BACKGROUND

CHEMICAL COMPOUNDS

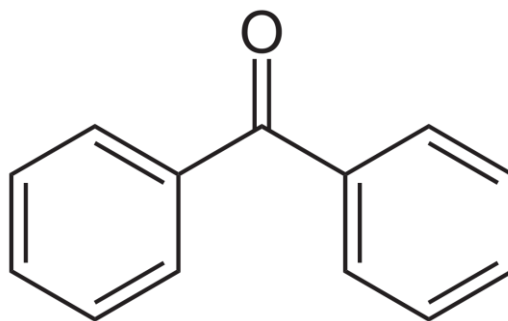


PROPOLIS

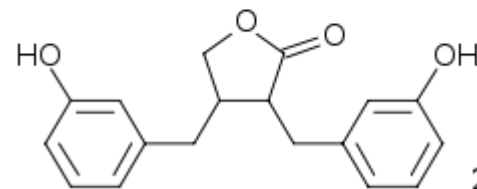
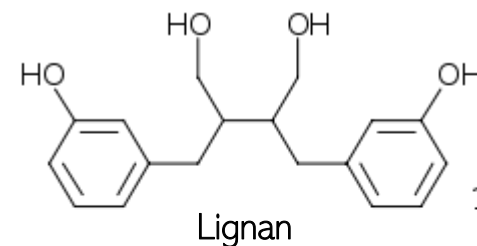


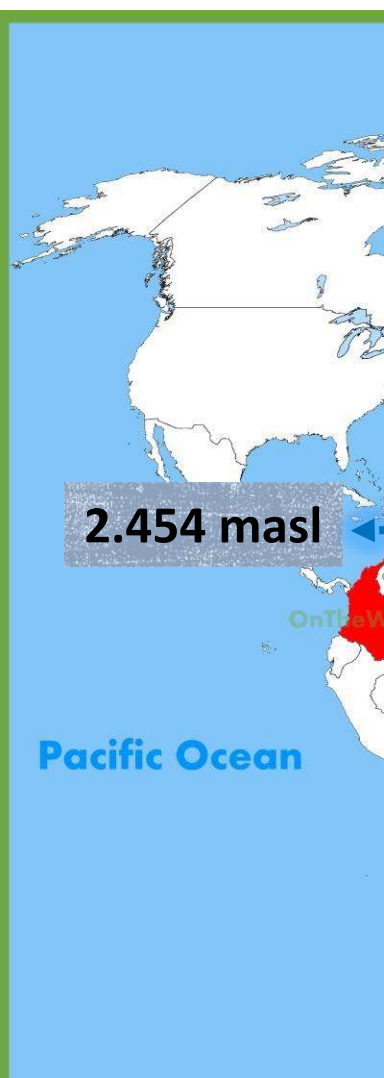
Other compounds

- Sugars
- Mineral elements
- Fatty acids



Benzophenones





COLOMBIAN PROPOLIS COMPOSITION

GAS CHROMATOGRAPHY AND MASS SPECTROSCOPY



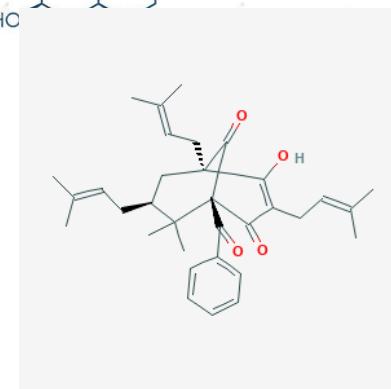
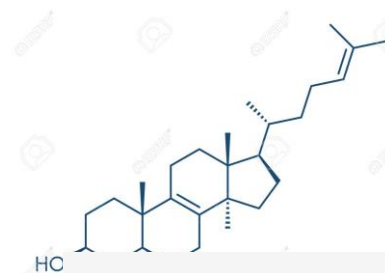
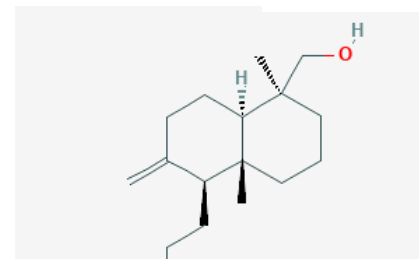
Fatty acids: Palmitic acid

Diterpens: Agathadiol

Flavonoids: Kaempferol

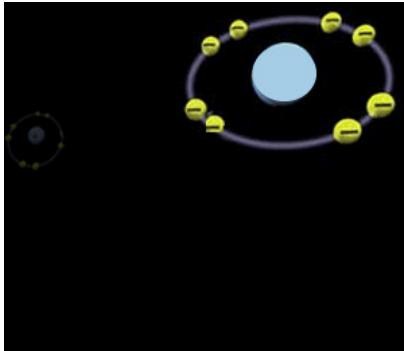
Triterpens: Lanosterol

Benzophenones: Nemorosone

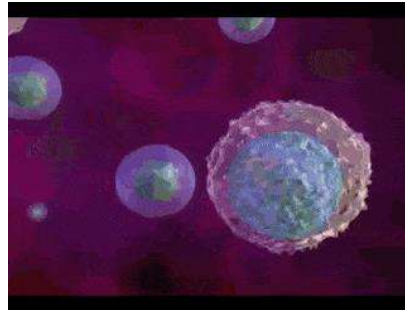


1) BACKGROUND

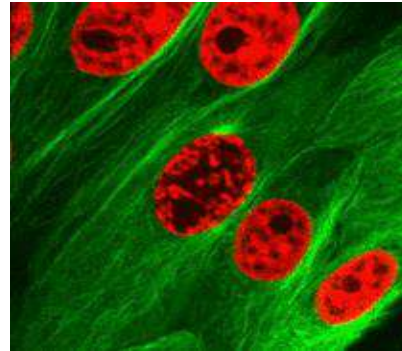
PHARMACOLOGICAL ACTIVITIES



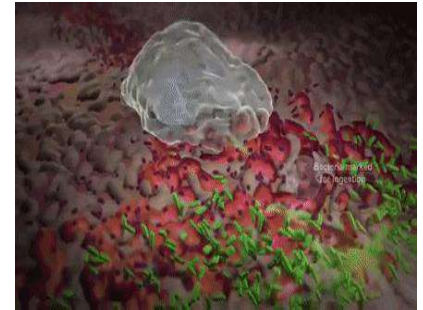
**Antioxidant
Action**



**Antiinflammatory
Action**



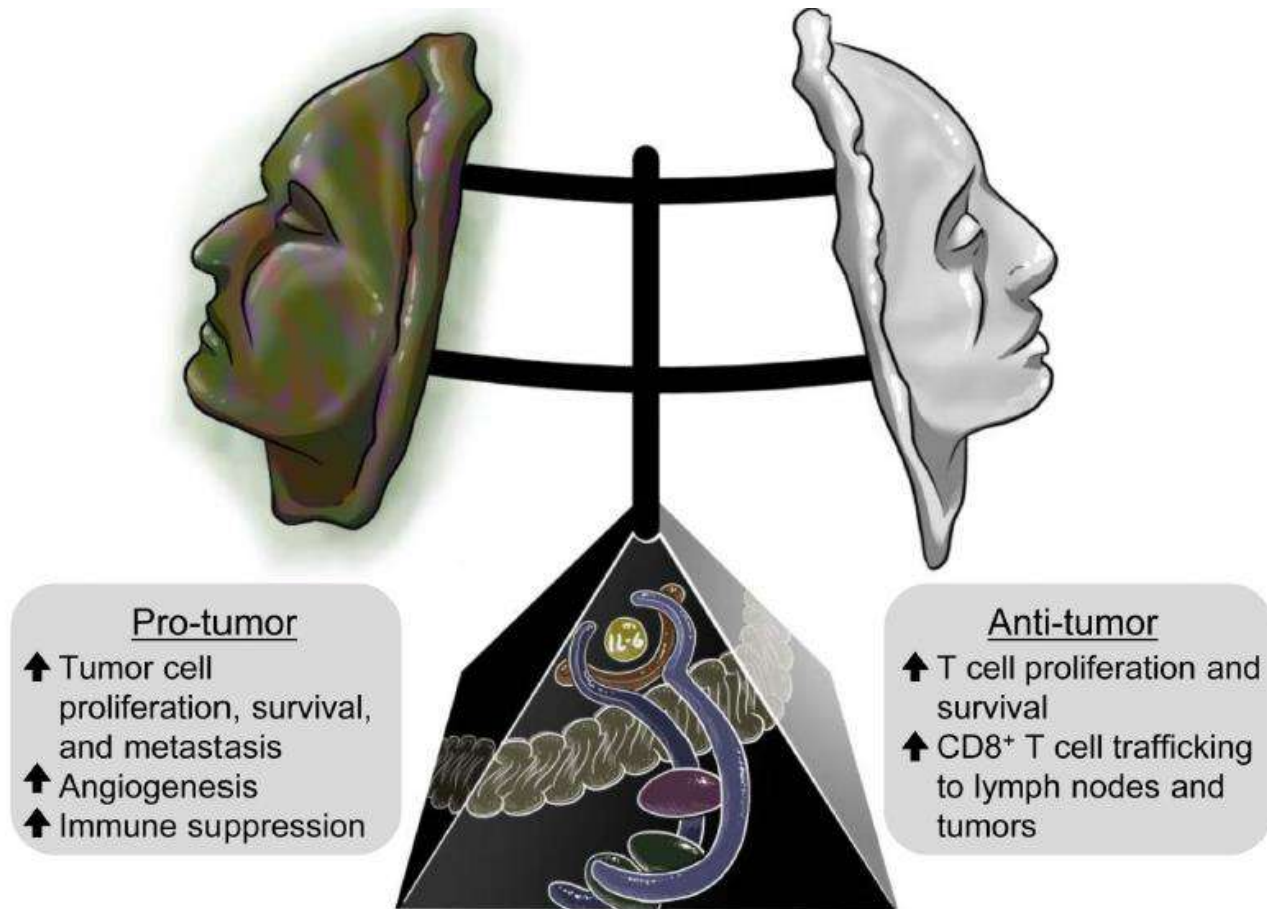
**Antitumor
Action**



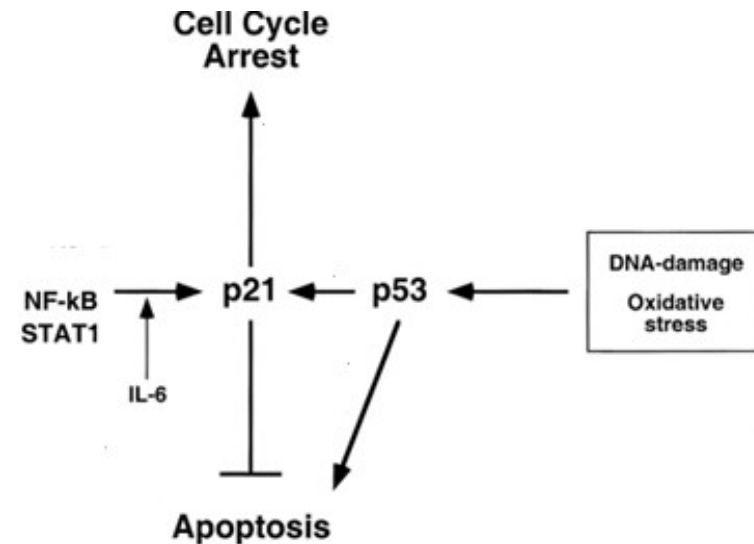
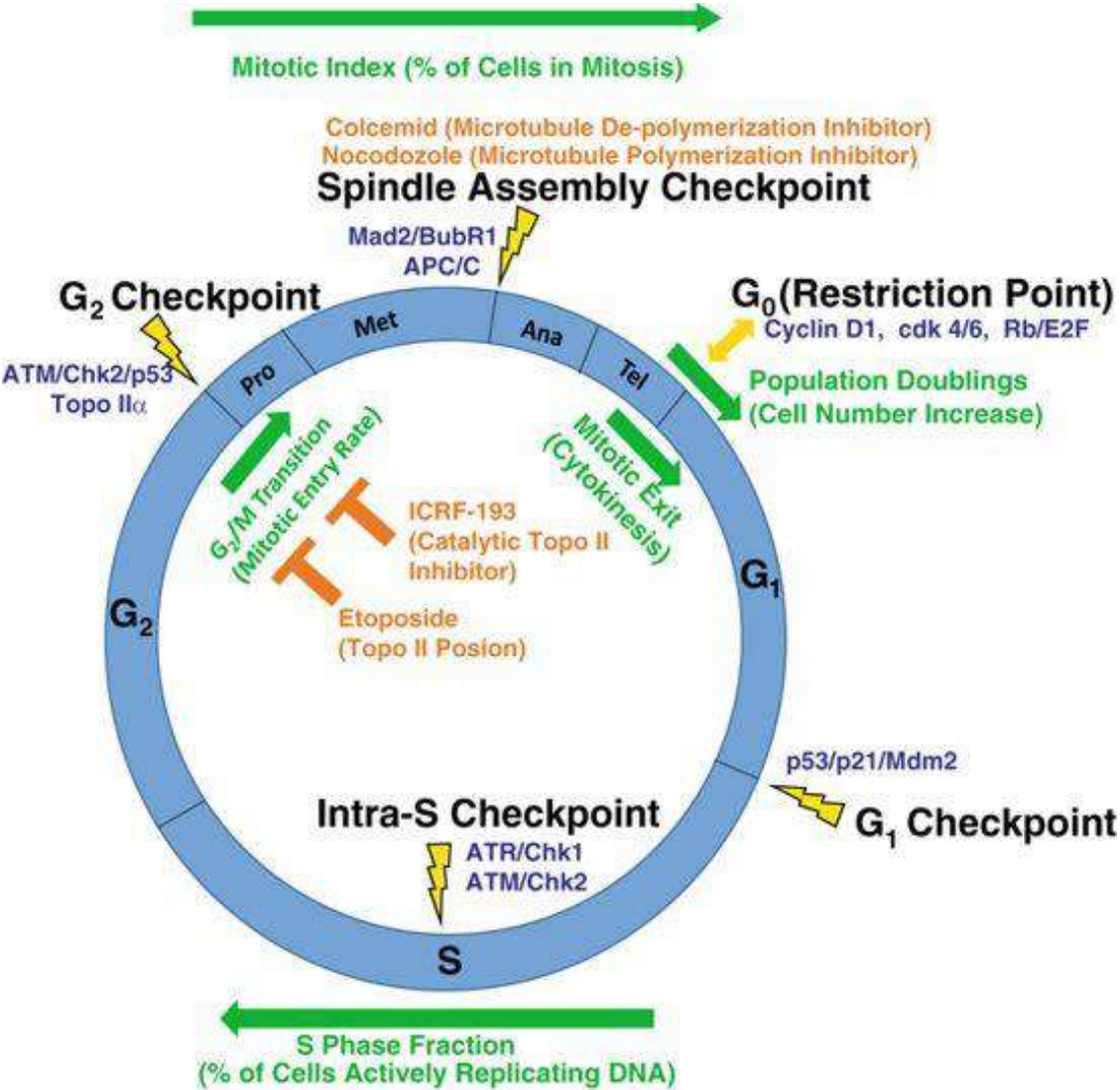
**Immunomodulatory
Action**

1) BACKGROUND

THE TWO FACES OF IL-6 IN THE TUMOR MICROENVIRONMENT



1) BACKGROUND

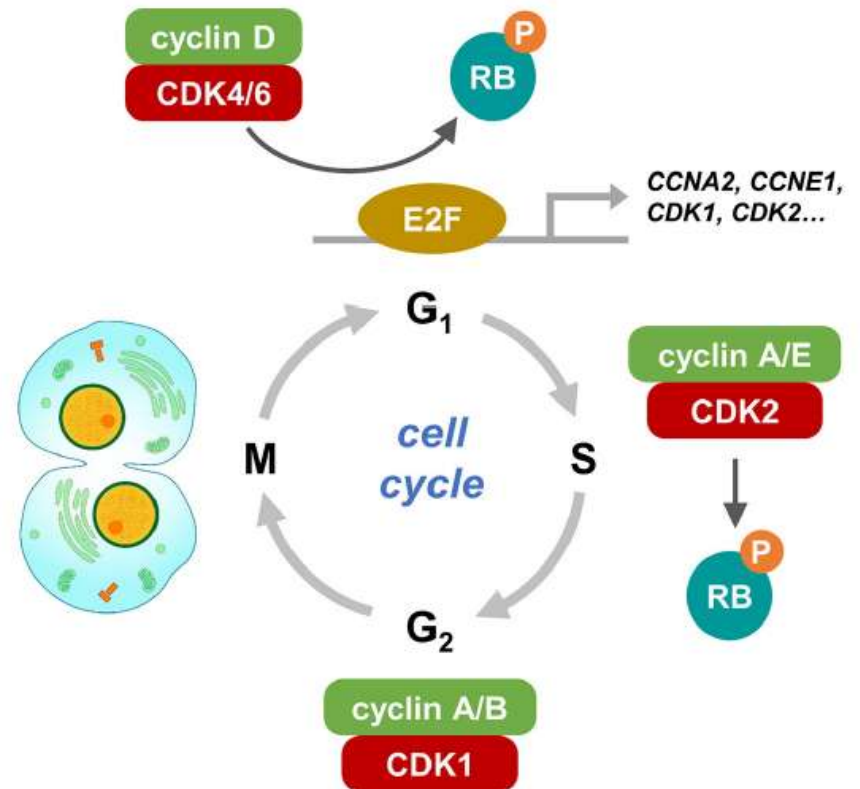
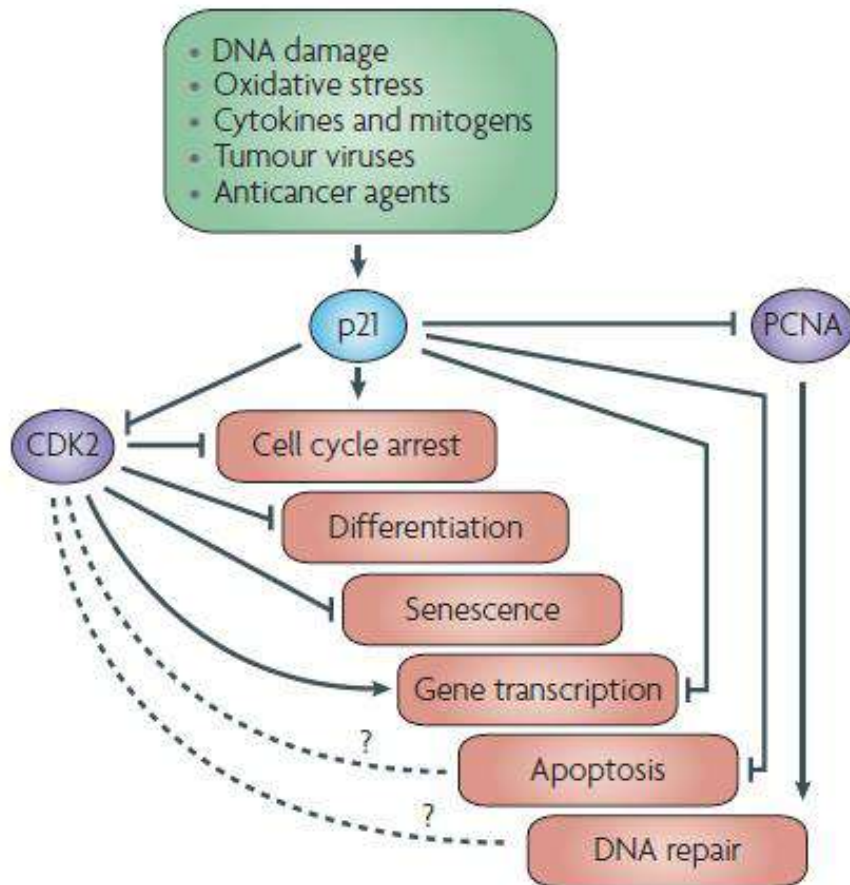


LEGEND

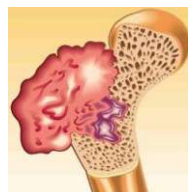
Major Checkpoint Regulators
 Measures of Cell Proliferation
 Drugs Inhibiting Cell Cycle Progression

1) BACKGROUND

THE ROLE OF p21 (*CDKN1A*)



1) BACKGROUND



**OSTEOSARCOMA (OSA) IS
A PRIMARY BONE
NEOPLASM**



**SARCOMA
ORIGINATED FROM THE
CENTRAL OR SPINAL
SKELETON**



**ABNORMAL
PROLIFERATION OF
MESENCHYMAL
CELLS**



**TREATMENT FOR OSA
INVOLVES
SURGERY COMBINED WITH
NEOADJUVANT AND/OR
ADJUVANT CHEMOTHERAPY**



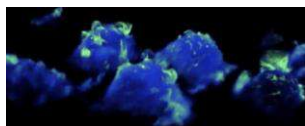
**CONSIDERABLE ADVERSE
EFFECTS ASSOCIATED
WITH THE DRUGS USED IN
OSA CHEMOTHERAPY**



PROPOLIS



**PROPOLIS AND ITS
EXTRACTED
COMPOUNDS ARE
CYTOTOXIC
TO VARIOUS TUMOR
CELLS**



2) OBJECTIVE



The objective of the study was to evaluate the effect of colombian propolis Ethanolic Extract (SIL) (25 µg/mL) in the relative expression of genes: *CDKN1A* (p21) and *IL-6* in an *in vitro* model of canine osteosarcoma (OSCA-8) after 48 hours of exposure and correlate it with previous findings of cytotoxicity.

3) MATERIALS AND METHODS



**PROPOLIS
(SIL)**



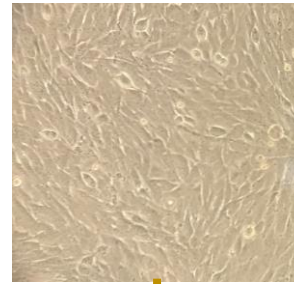
**25 µg/ml
EEP**



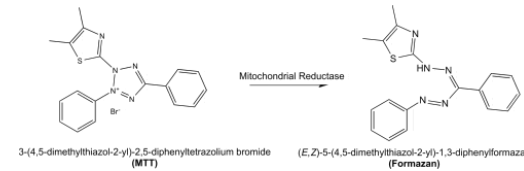
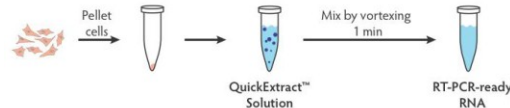
70%

48 h

**OSCA-8 CELL
LINE (40X)**

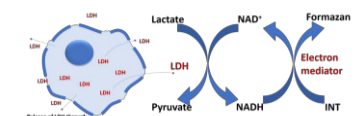


**WERE GROWN IN
DMEM + FBS (10%)**



MTT

LDH



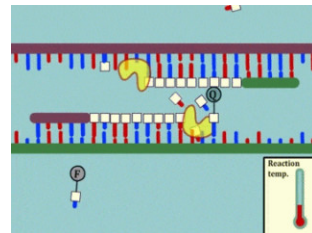
Control +
Treated cells
with DOX
0,25 µM

Control -
Untreated
cells

**Gene
expression was
evaluated**

CDKN1A (p21)

IL6



Control

The absorbance of
untreated cells
was considered as
100% cell viability

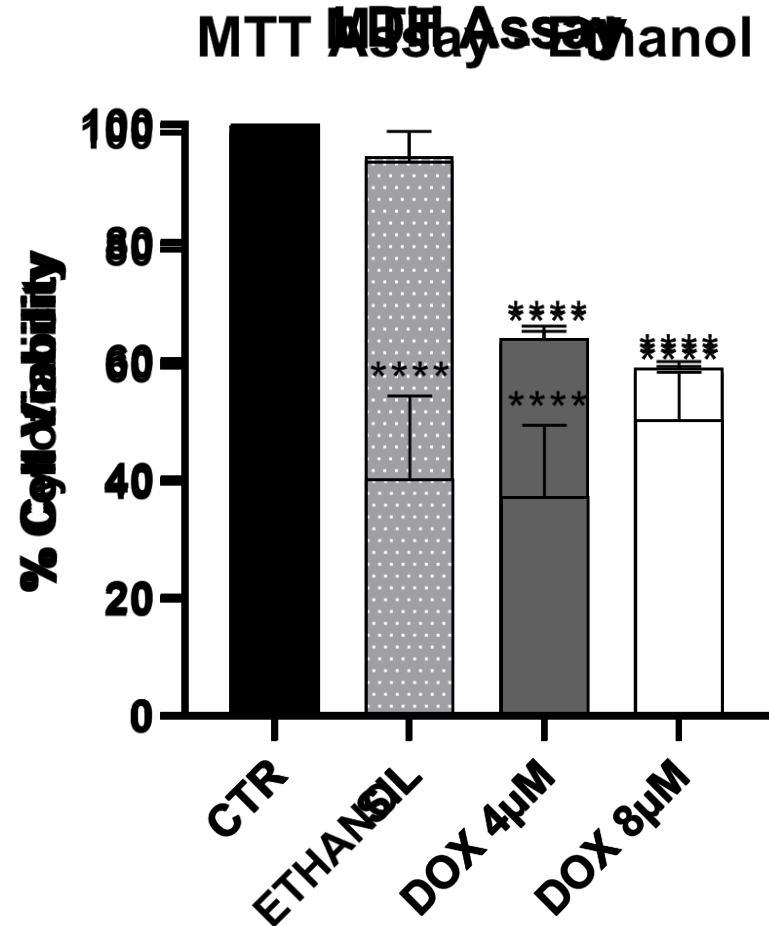
Control

Positive control
absorbance was
considered as
100% cytotoxicity

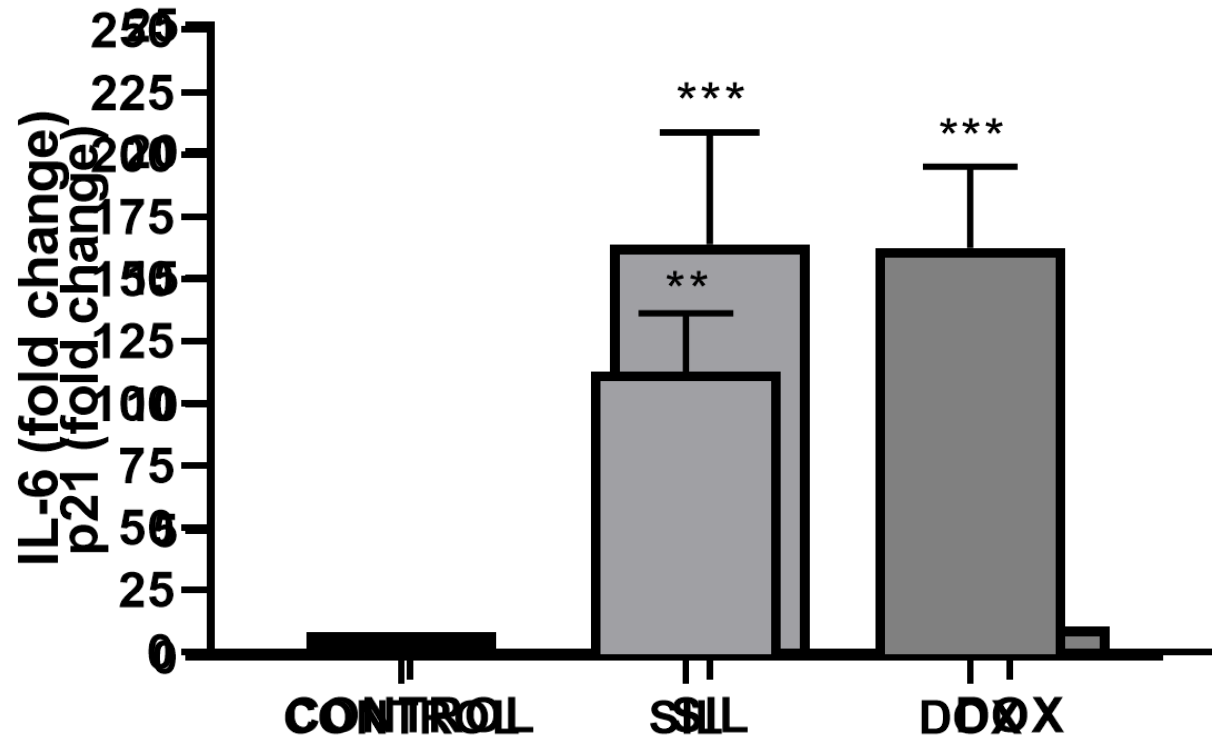
The effect of 70%
ethanol (propolis
solvent) was also
evaluated

Doxorubicin (DOX)
4µM and 8µM

4) RESULTS

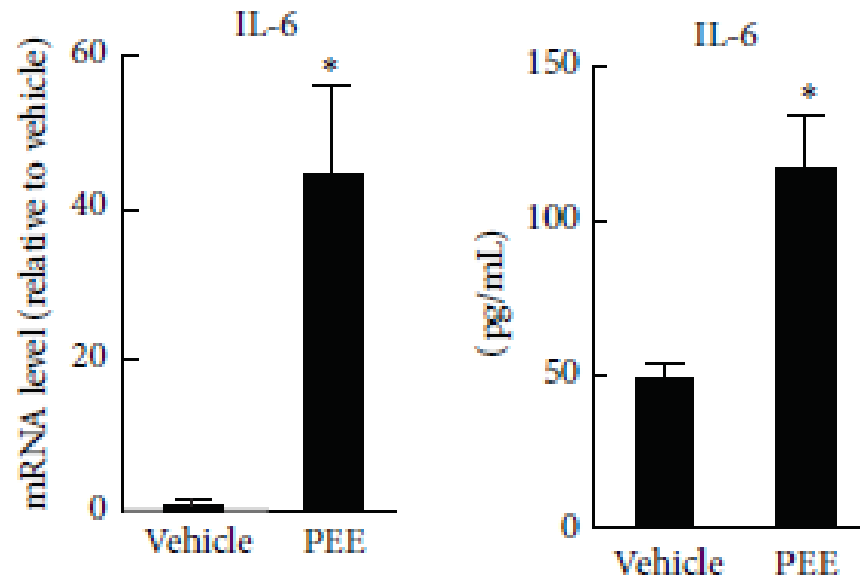


4) RESULTS



5) DISCUSSION

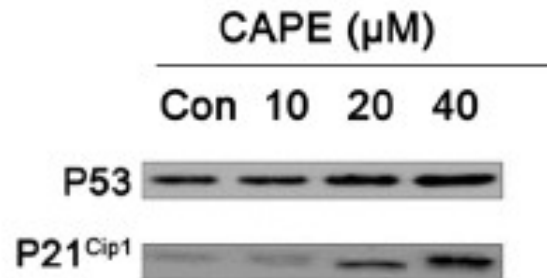
Effects of propolis ethanol extract (PEE)
(100 µg/mL) from Brazilian propolis on
mRNA expression (8h) and protein (12h)
in culture medium of IL-6 in myoblast



Washio et al. 2015

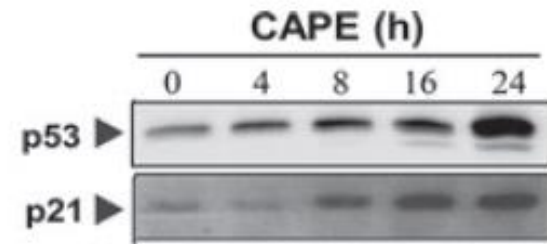
5) DISCUSSION

Treatment in HT-29 cells with
CAPE for 48 h

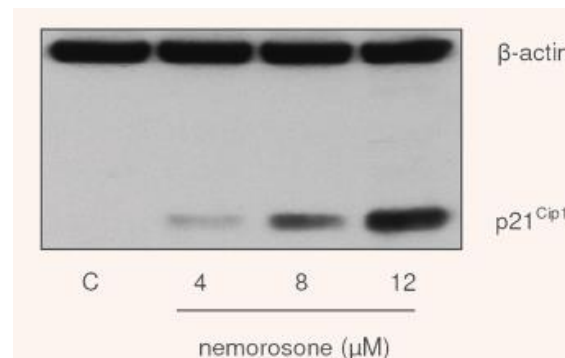


Tang et al., 2017

Effect of CAPE on the expression
of p53 and p21 in ME180 cells
treated with 25 μM



Hsu, et al 2012



Influence of nemorosone on
cell cycle regulation in LAN-1
cells after exposure for 24 h.

Díaz, et al 2008

p21

6) CONCLUSIONS

- The present study explored the *in vitro* effect of Colombian propolis sample (SIL) in OSCA-8 cell line, the extract increased cytotoxicity even more than doxorubicin.
- Colombian propolis sample (SIL) immunomodulatory action in vitro OSCA-8 cells could be given by increase in *IL-6* gene expression.
- Colombian propolis sample could be inducing arrest cells OSCA-8 blocked at the G₂/M phase related p21 gene (*CDKN1A*).
- There are no works dealing with Colombian propolis, OSA and immunomodulatory and cell cycle genes, and our preliminary data show a possible molecular mechanisms of action in osteosarcoma cell line.

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CONTACT

ojmurillot@unal.edu.co

