Comparative Effects of Vitamin C, Curcumin and Sambucus nigra Extract on Cell Viability and Cytokine Levels of Cigarette Exposed Lung Epithelium Cell Culture

Abdullah Eren Özkaya, Hanife Sevgi Varlı, Ayşegül Yabacı Tak,
Nelisa Laçin Türkoğlu, Fatmanur Karaköse Okyaltırık

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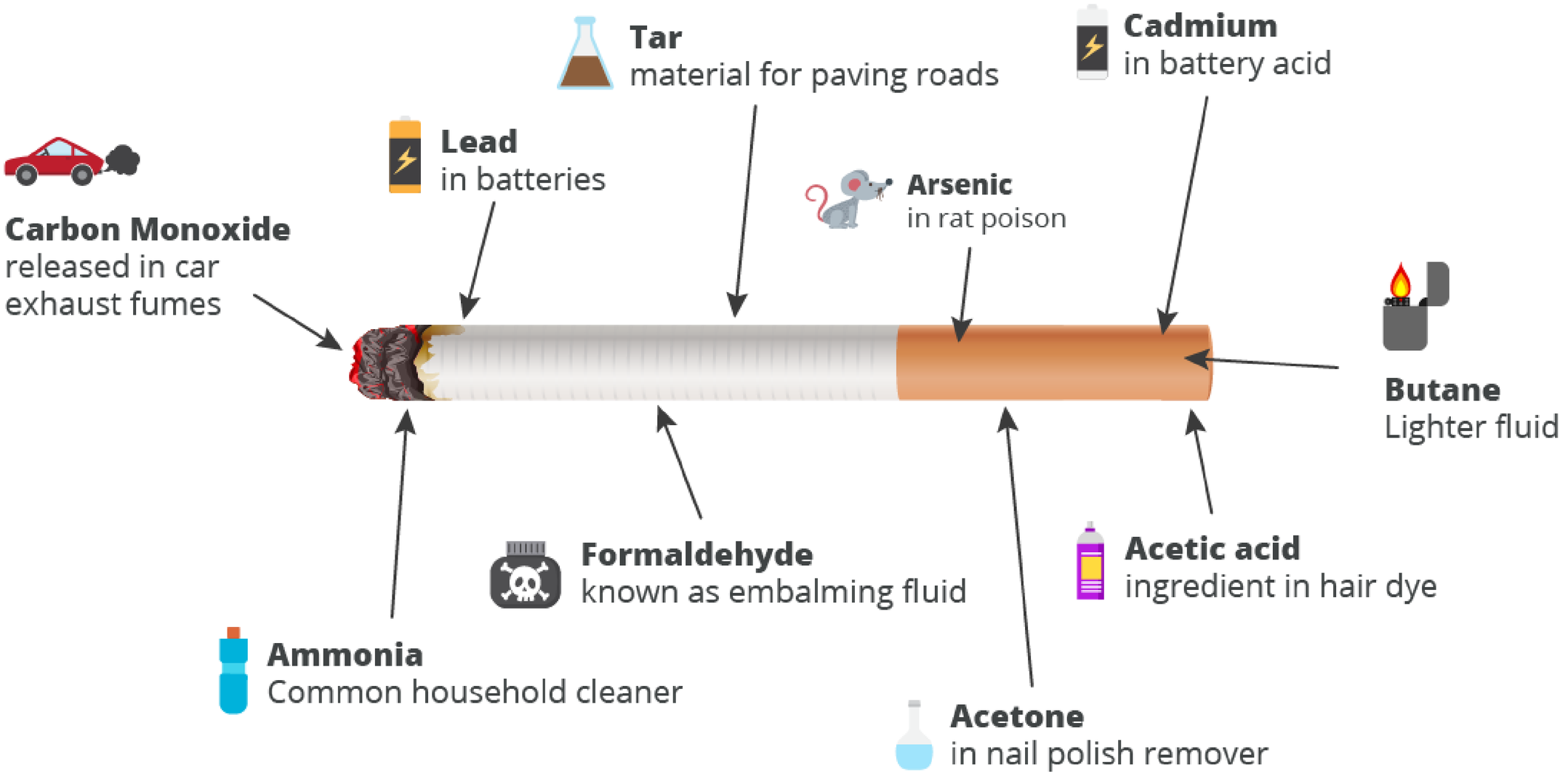
Table Of Contents

Cigarette Smoke & **Lung Health**

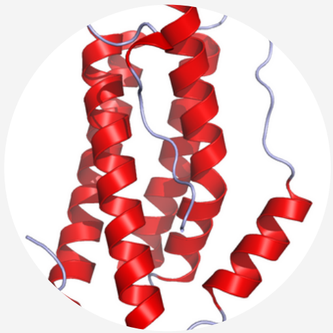
According to the World Health Organization (WHO);

Tobacco use is an international public health problem and causes the death of 1 in 10 people worldwide.

It is known that smoking significantly reduces antioxidant levels in the body.


Tar
material for paving roads
Cadmium
in battery acid
Lead
in batteries
Arsenic
in rat poison
Carbon Monoxide
released in car
exhaust fumes
Butane
Lighter fluid
Formaldehyde
known as embalming fluid
Acetic acid
ingredient in hair dye
Ammonia
Common household cleaner
Acetone
in nail polish remover

Cytokines & **Immunity**

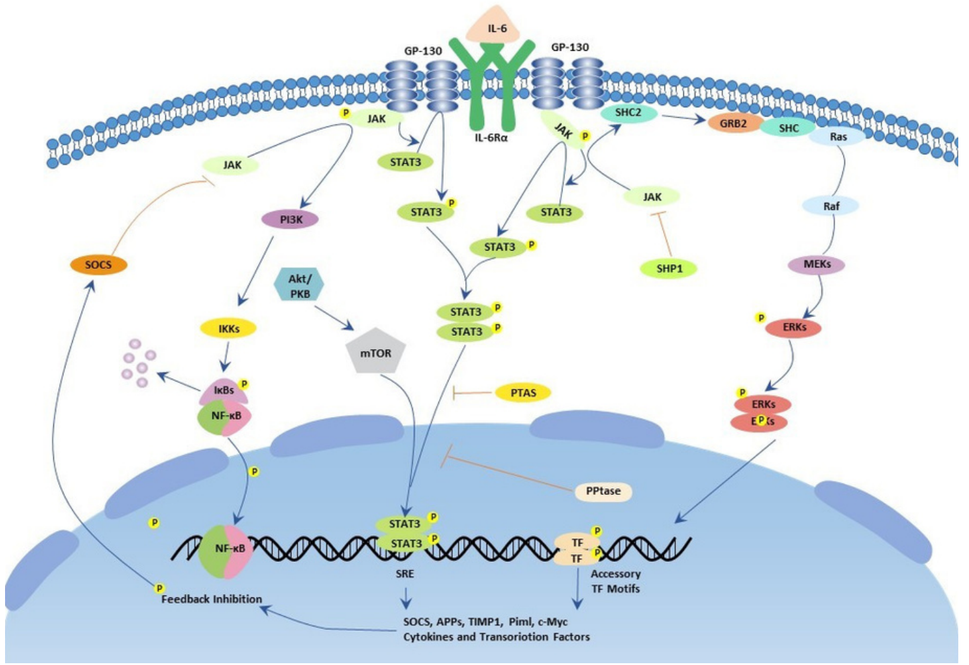


Interleukin 6

Tumor Necrosis Factor Alpha

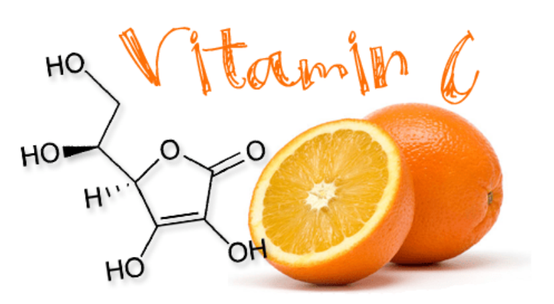
Cytokines are the main modulators of the immune system.

They are important cell signaling molecules produced by immune cells as a result of ***infection and inflammation.***



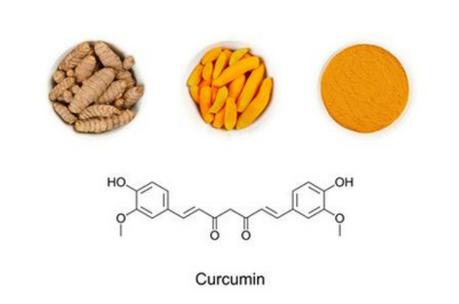
IL-6 Signaling Pathway

Natural **Products**



Vitamin C

Known & effective antioxidant



Curcumin

Most active compound of Curcuma longa (Turmeric)

Sambucus nigra

Popular product in effervescent tablets

Aim of the **Study**

- To investigate and reveal the mutual anti-inflammatory effects of **Vitamin C, Curcumin and Sambucus nigra.**

- To obtain **preliminary study data** for smoking & the treatments of diseases that develop due to smoking.

Methodology

Overall, 6 work packages were planned
to last approx. 2-3 months.

That was naive :)

Preparing The Cigarette Smoke Extract (CSE)

1

Interacting The Cells With CSE & Determining Toxicity Levels

2

Detection of Cytokine Levels From Cells After Interaction with CSE

3

Interaction of Natural Compounds and Evaluation of Their Effects

4

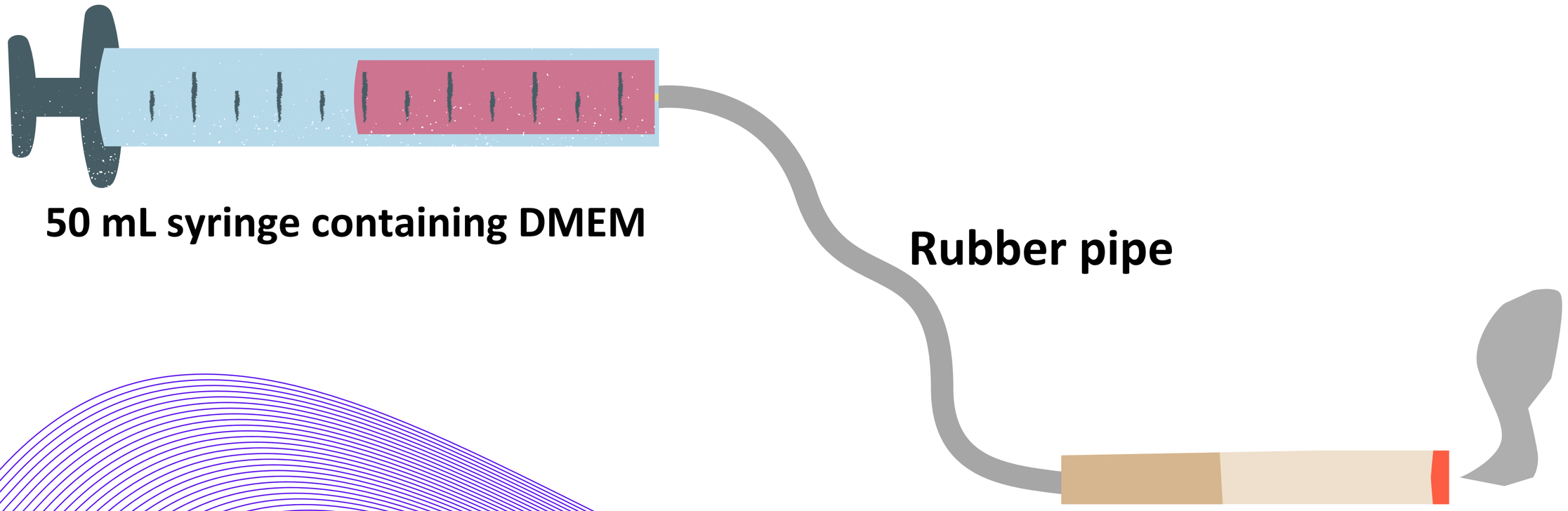
Detection of Cytokine Levels After Interaction with Natural Compounds

5

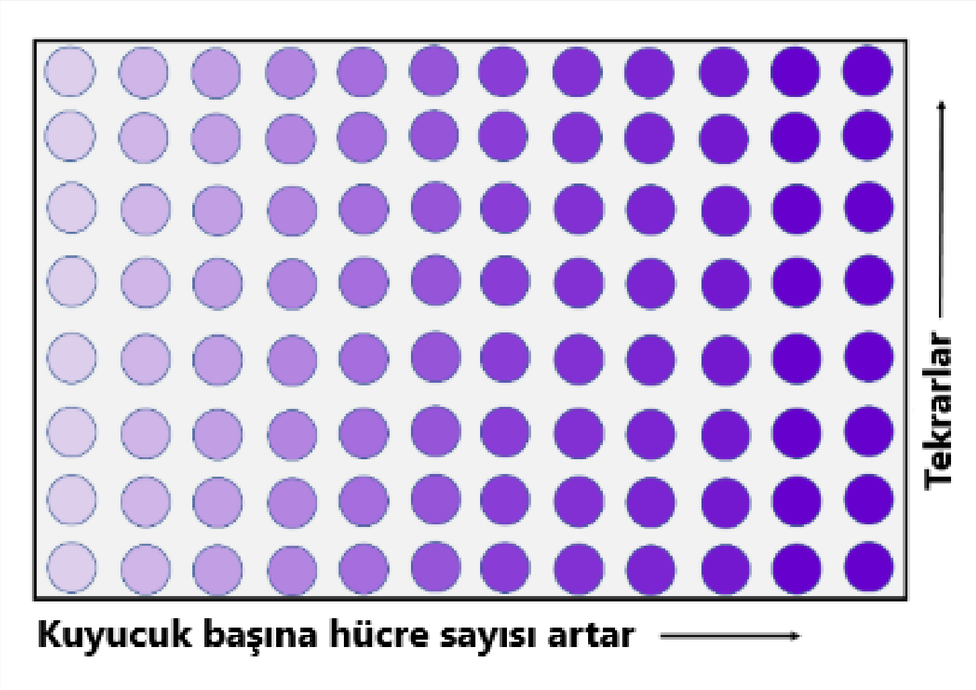
Statistical Works

6

Cigarette Smoke Extract



MTT **Analysis**



A common method to analyze cell proliferation and viability.

As the purple color darkens, the number of viable and metabolically active cells increases.

Enzyme-linked immuno sorbent assay

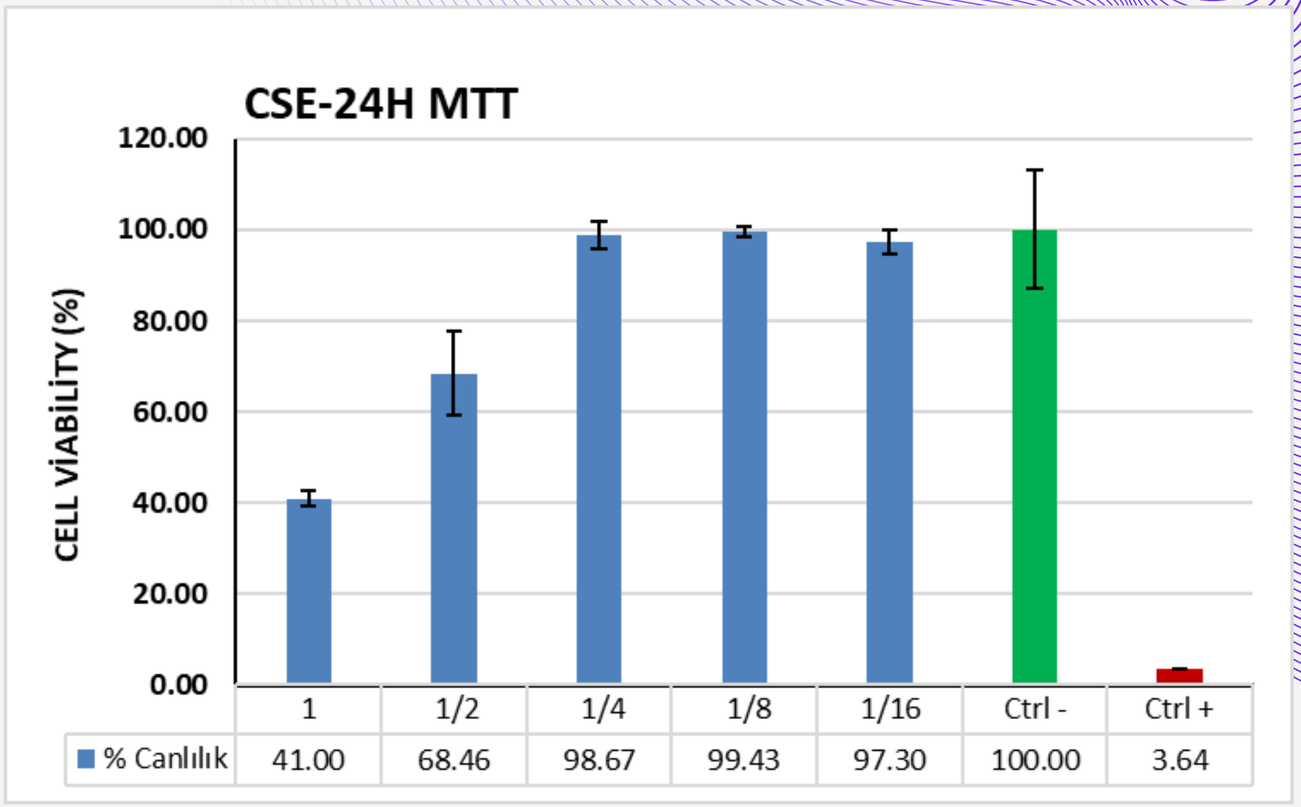
Designed for detecting and quantifying soluble substances such as peptides, proteins, antibodies and hormones.

ELISA Tests

Results

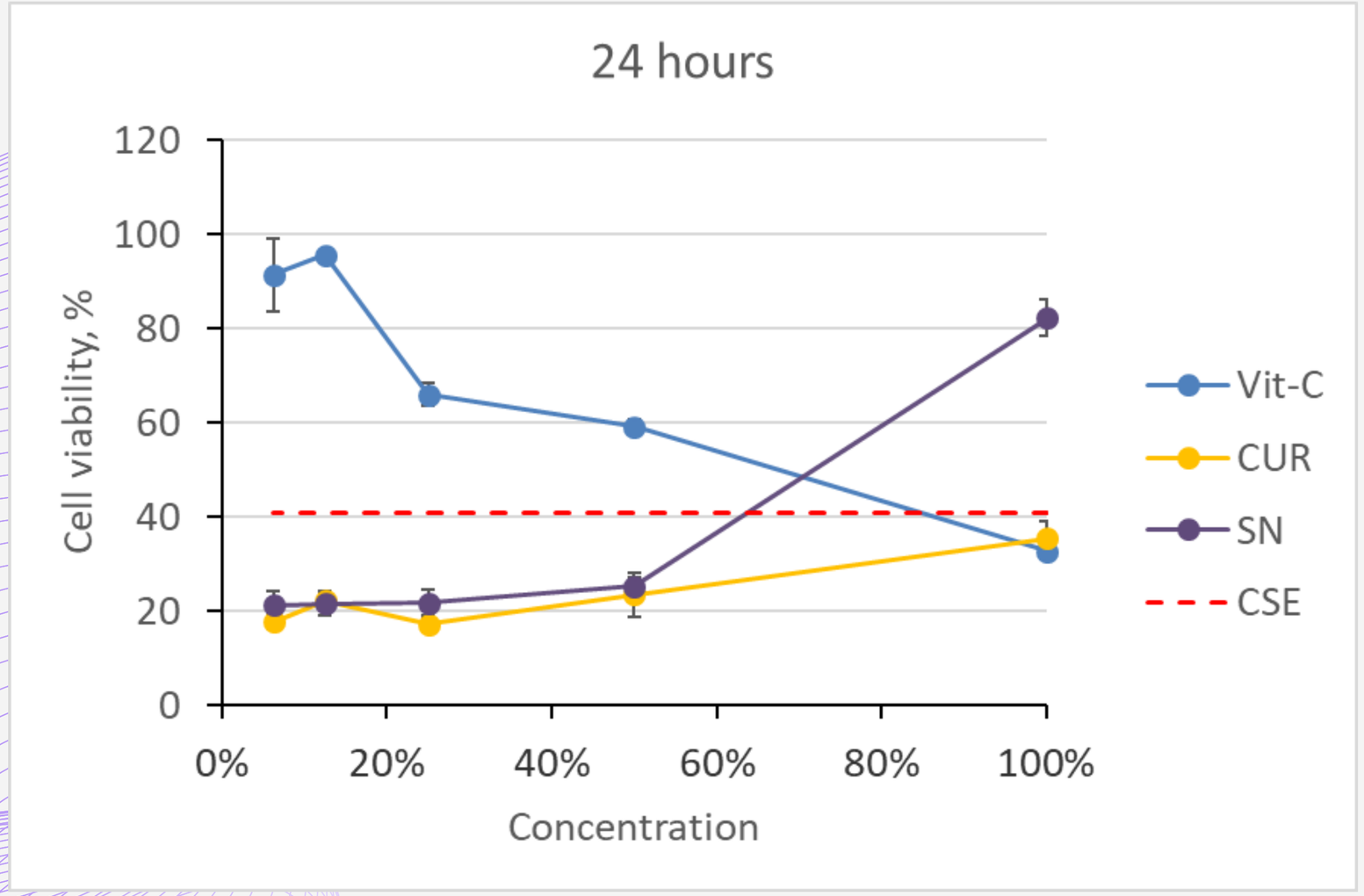
(Cigarette Smoke Extract)

With these results, we chose the %100 concentration of CSE (1) to continue with the rest of the experiments.



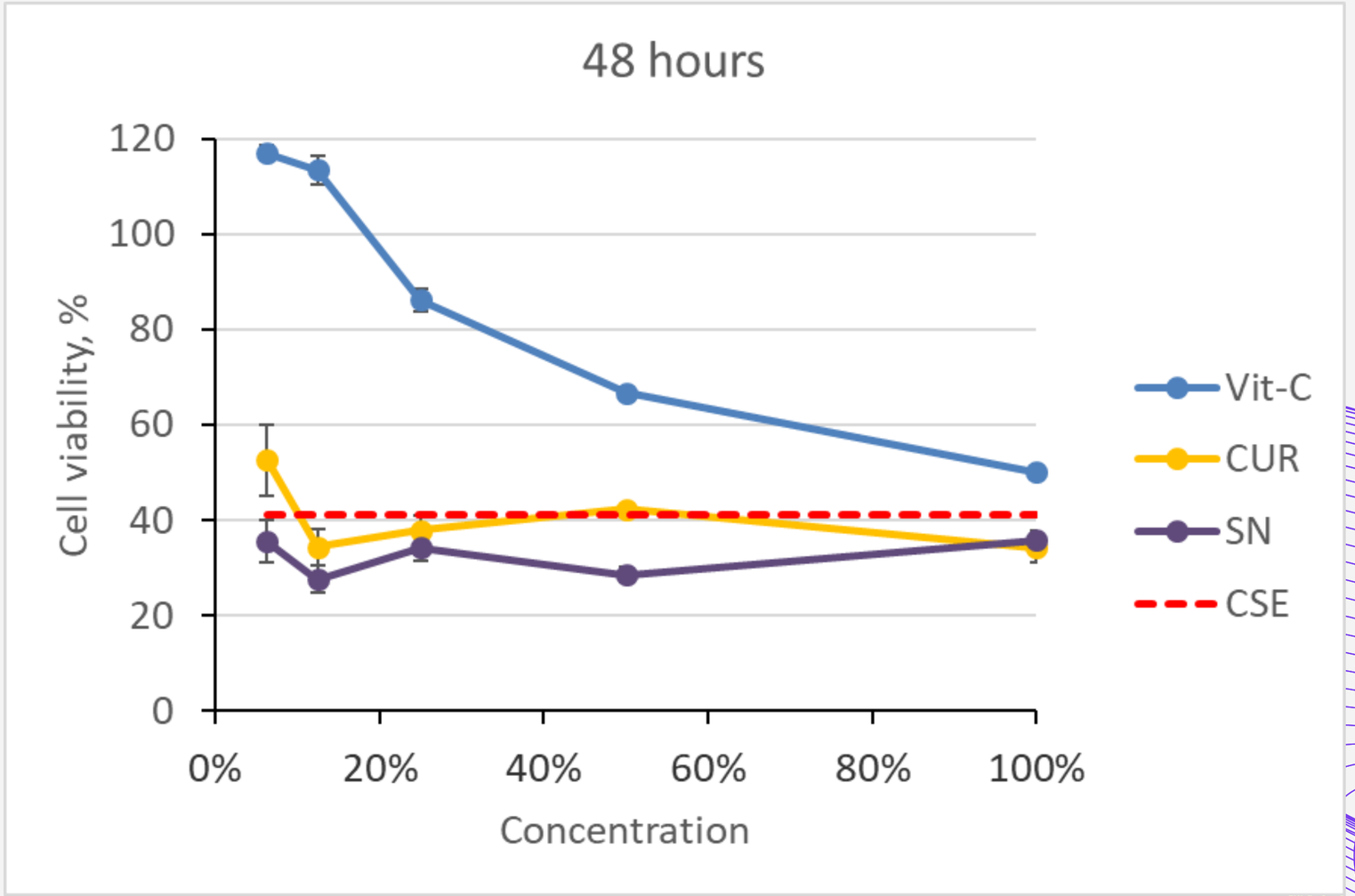
Results

(24 hours post natural compound exposure MTT)



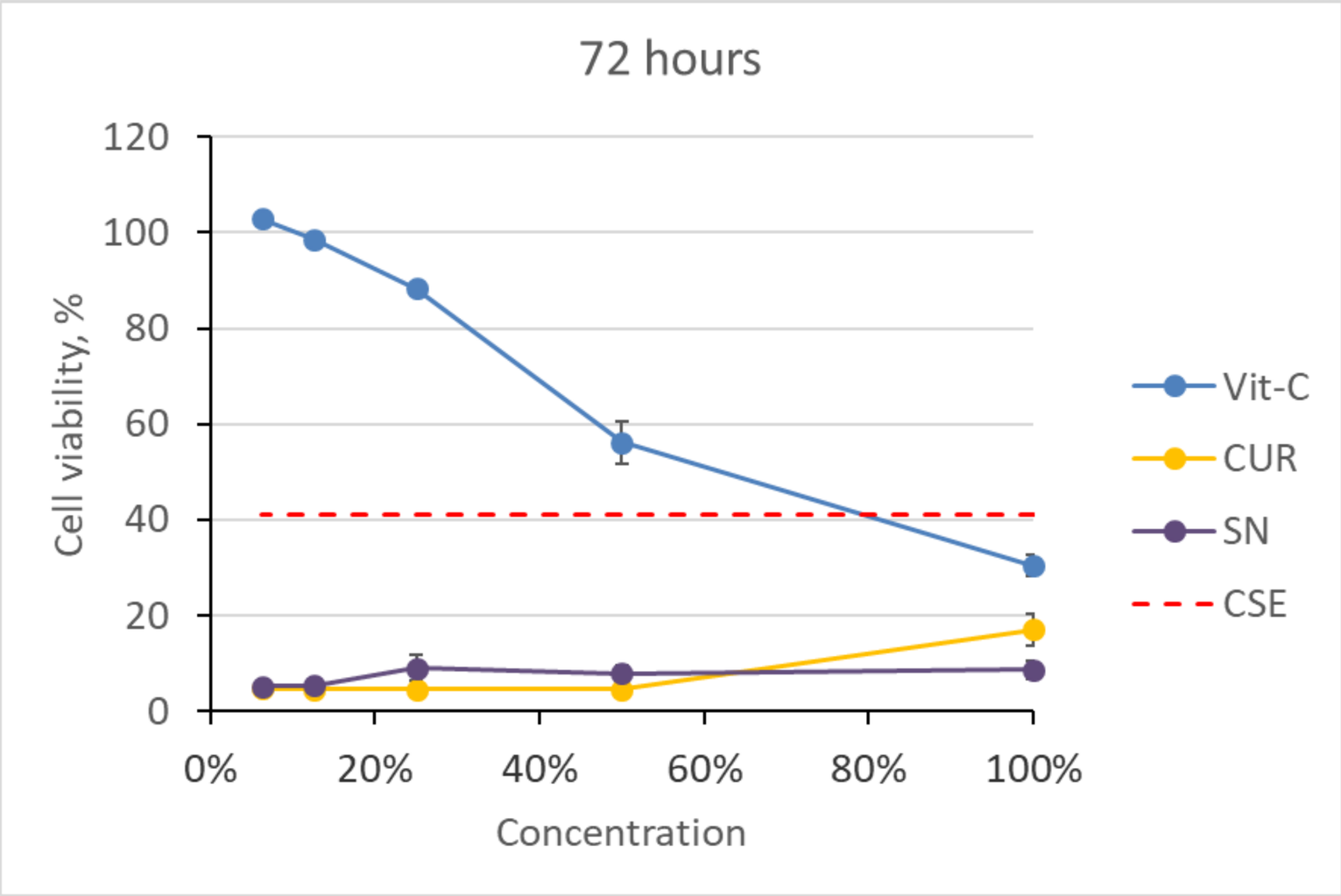
Results

(48 hours post natural compound exposure MTT)



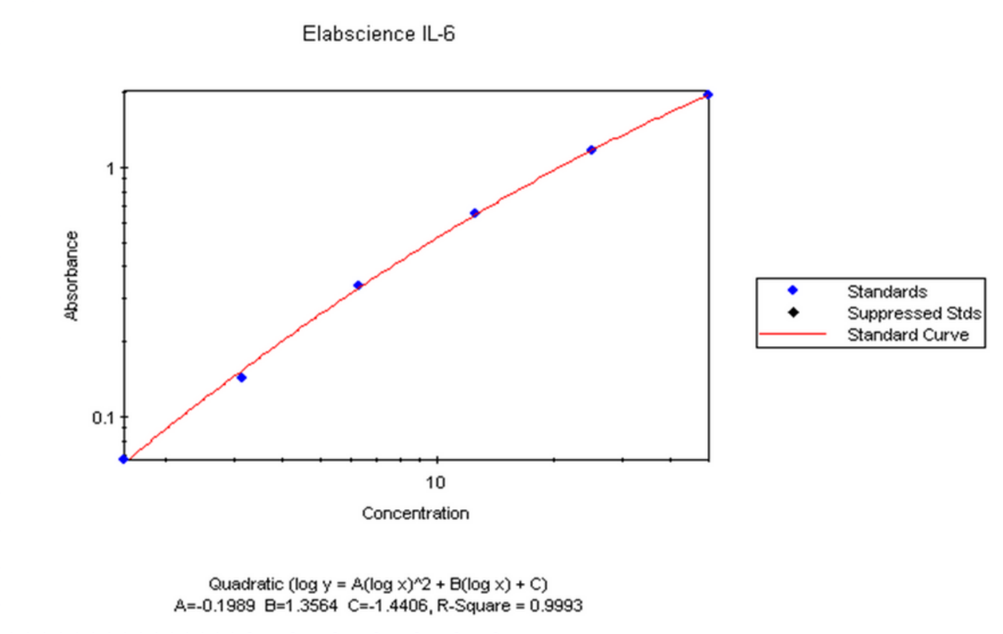
Results

(72 hours post natural compound exposure MTT)



Results

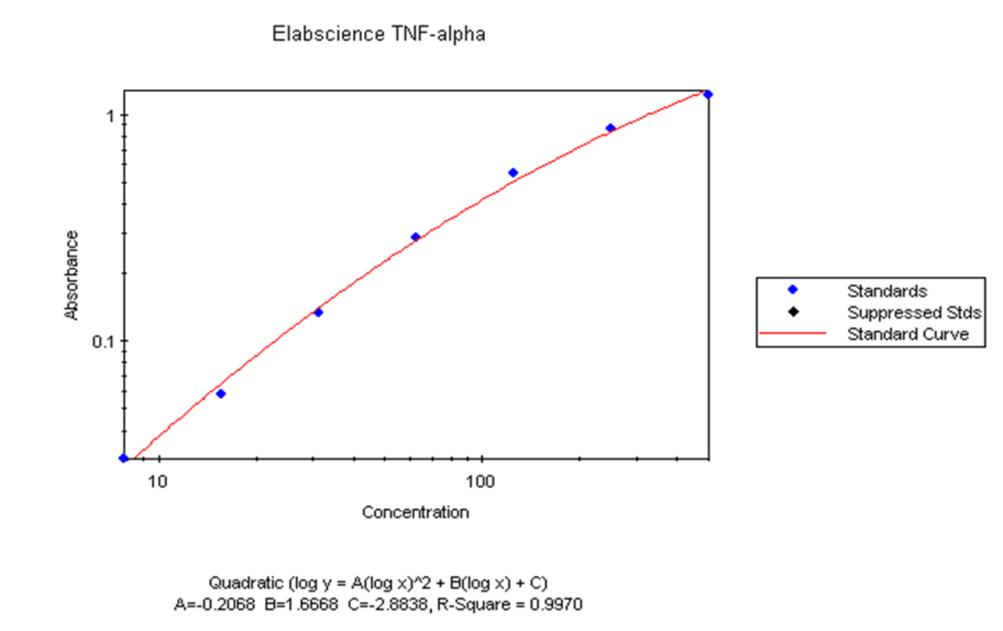
(IL-6 ELISA test)



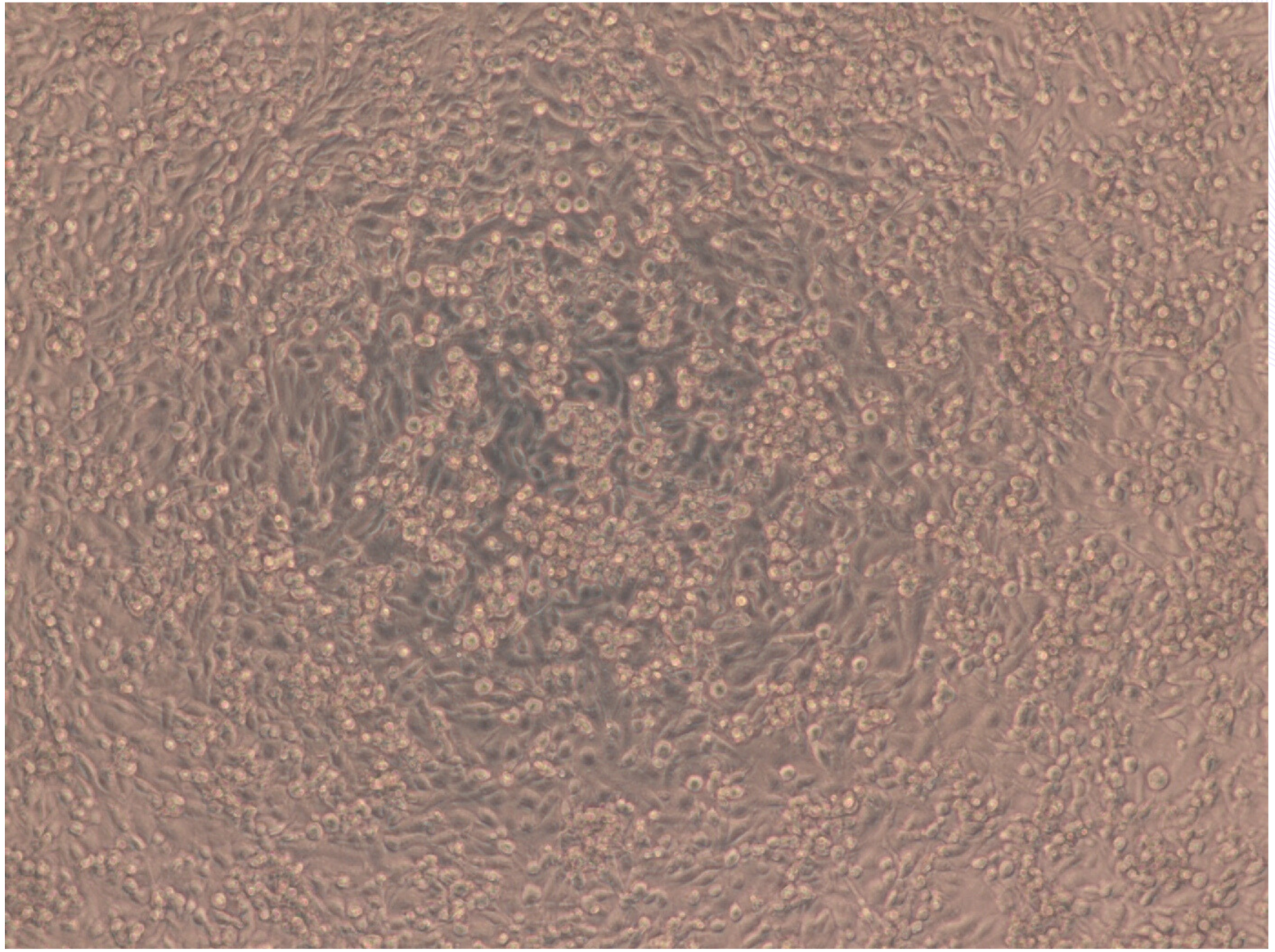
VIT1: 0.10	VIT2: 0.08
VIT3: 0.29	VIT4: 0.32
VIT5: 1.10	SN1: 0.95
CUR1: 0.95	**CSE: 28.97**

Results

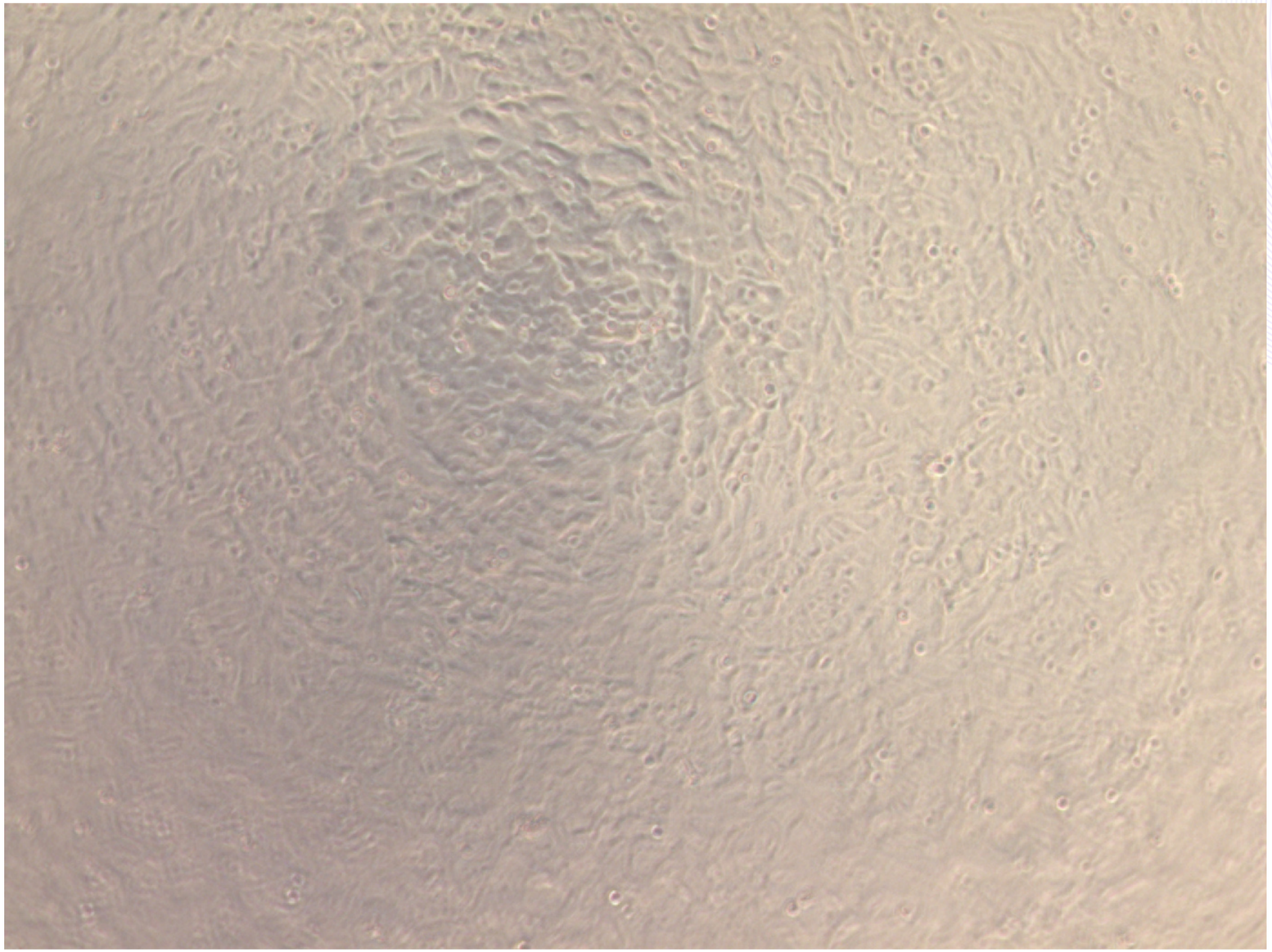
(TNF-α ELISA test)



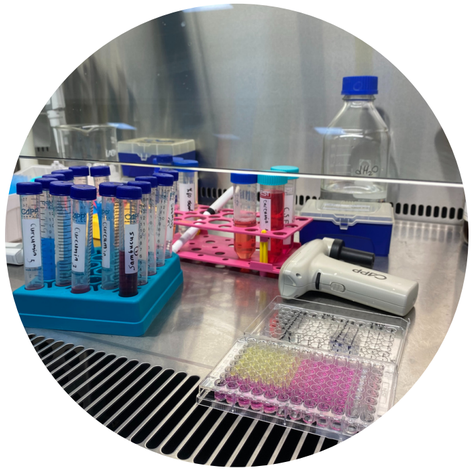
VIT1: 0.51	VIT2: 1.95
VIT3: 0.31	VIT4: 1.74
VIT5: 2.77	SN1: 3.38
CUR1: 1.95	CSE: 6.06



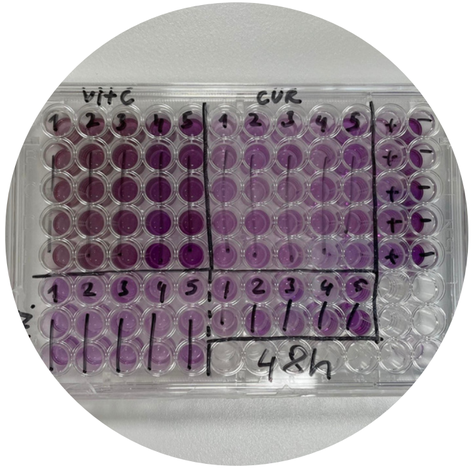
Healthy & metabolically active lung epithelium cells under the microscope



Unhealthy lung epithelium cells treated with DMSO under the microscope



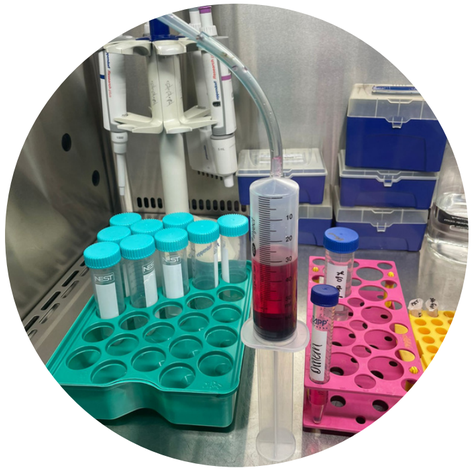
Conclusions



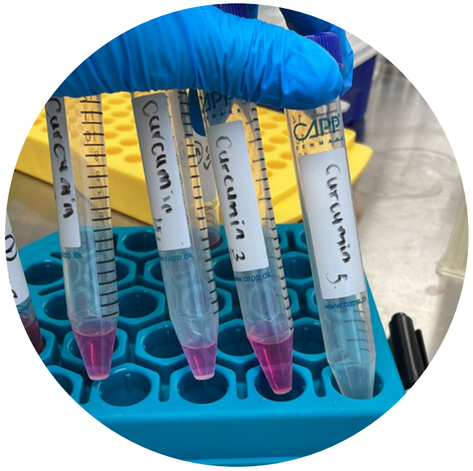
Substances’ effects on cells are dose and time dependent.

In Vitamin C group, cell viability increased as the dose decreased. Pro-inflammatory & toxic effects?

Curcumin & S. nigra groups showed overall low viability except the highest concentrations. Chosen doses may be low to observe healing effects.



Conclusions

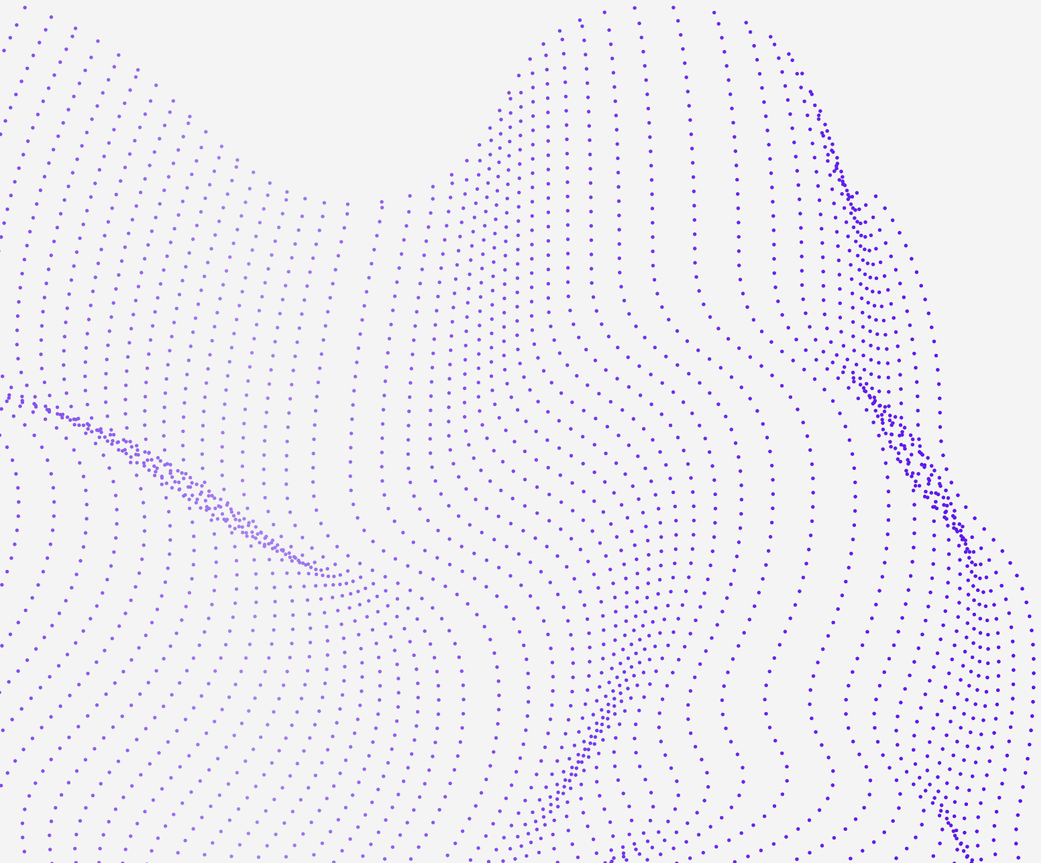


ELISA test results showed that cigarette exposure started an inflammatory process in lung cells.

After the natural product exposures, all our products reduced inflammation with their anti-inflammatory effect lowering the cytokine levels.

It should be considered that this is only an in-vitro study and inflammation process in human body is much complex with different cells and molecules taking part.

Many Thanks to:



Assoc. Prof. Dr. Fatmanur Karaköse Okyaltırık

Dr. Hanife Sevgi Varlı, RA

Prof. Dr. Nelisa Laçin Türkoğlu

Asst. Prof. Dr. Ayşegül Yabacı Tak

Prof. Dr. Hasret Demircan Yardibi

Asst. Prof. Dr. Fırat Barış Barlas

Dr. Özge Nur Kanat, TA

Prof. Dr. Abdürrahim Koçyiğit

YTU MERKLAB

Nuvita Research Center

Farmasina, Meral Yıldırım

Bezmialem Scientific Research Project Coordination

TUBİTAK

Prof. Dr. Bestami Özkaya, Zübeyde Özkaya, Rana Özkaya
Dr. Ege Yağıbasan, Dr. Nora Bağam, Dr. Ecem Pezük, Dr. Ekin Vardar,
Dr. Melike Duran, Dr. İdil Bilgin

Thank you
for listening!

Any questions?

E-mail

eerenozkayaa@gmail.com

GSM

+905319310250