

## USNEA BARBATA (L.) F.H.WIGG. EXTRACT – ACTION ON TUMOR CELLS MORPHOLOGY

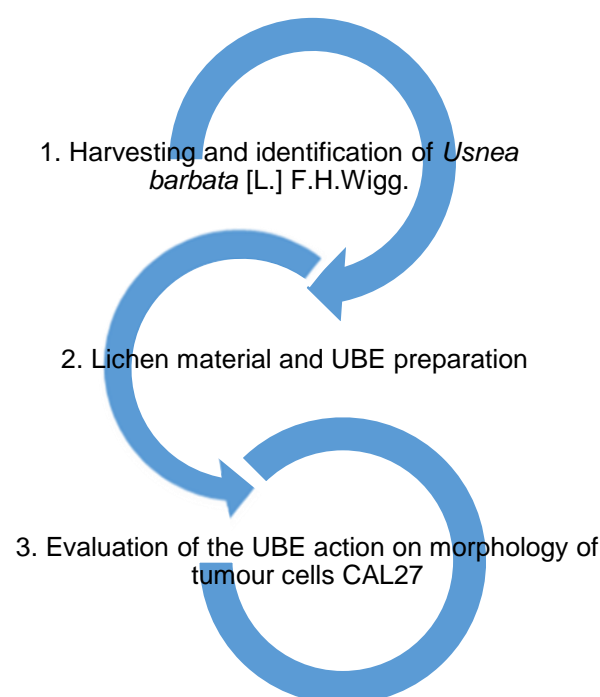
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### Introduction

*Usnea barbata* (L.) F.H.Wigg. - known as “old man’s beard”, “tree moss”, “songluo” is a lichen in the family *Parmeliaceae*, genus *Usnea*. *Usnea* species has a recorded history of therapeutic use dating back over three thousand years in Chinese medicine.

The numerous therapeutic applications are due to their phytochemicals contained and which represent almost 60 organic compounds with various structures: polyphenols, dibenzofurans, depsidones, depside, depsones, fatty acids, lactones, quinones, polysaccharides. These secondary metabolites have shown a high range of biological activities including antibiotic, antifungal, antiviral, anti-inflammatory, anticancer properties.

In this study, the activity of *Usnea barbata* (L.) F.H.Wigg. extract (UBE) was evaluated by observing the morphological changes on squamous cells carcinoma cell-line CAL 27 (ATCC® CRL-2095™) after 24 hours of contact with various concentration of lichen extract.

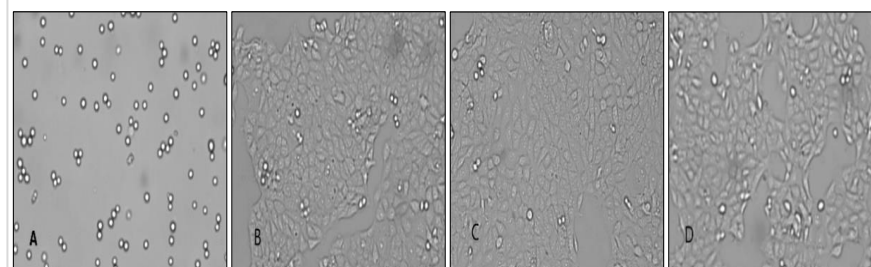


### Results

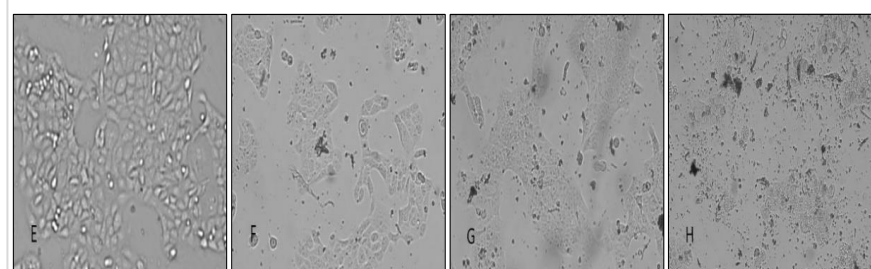
The changes on morphology of CAL 27 cells are directly proportional with the concentration of UBE used.

As shown in Figure 1, at the moment of the effective realization of the experimental groups, the cells have a globular appearance and do not adhere to the substrate, being in Brownian motion in the culture medium. The study on control cells, and also in DMSO 0.2%, indicated that, after 24 h of treatment, these cells have a normal morphology and are adherent to the substrate (Figure 2). The morphological study on the tumor cells exposed to UBE showed that CAL27 cells had different degrees of morphological changes, as follows: loss of cell adhesion, membrane contraction, formation of abnormal cell folds, cell fragmentation, reduction of the density of living cells (figures: 1., C-D and 2., E-H).

These changes are most significant at the maximum concentration of UBE in the tested solutions.



**Figure 1.** Morphology of CAL 27 cells in the initial inoculation phase (A), after 24 hours of contact with 0.2% DMSO (B), after the contact with UBE tested solutions: 12.25 µg/mL (C); 25 µg/mL (D)



**Figure 2.** Morphology of CAL 27 cells, after the contact with UBE tested solutions: 50 µg/mL (E); 100 µg/mL (F); 200 µg/mL (G); 400 µg/mL (H)

### Conclusions

The extract of *Usnea barbata* (L.) F.H.Wigg. produces changes in morphology of CAL 27 cells, their intensity being directly proportional to the concentration of UBE.

The main morphological cell changes include loss of adhesion, membrane contraction, abnormal cell folds, cell fragmentation and, consequently, the reduction of the living cells density.

The results of our preliminary study provide a valuable basis for future studies in order to suppose the mechanisms of UBE tumor cell death induction.

### Acknowledgements

This work is supported by the project ANTREPRENORDOC, in the framework of Human Resources Development Operational Programme 2014-2020, financed from the European Social Fund under the contract number 36355/23.05.2019 HRD OP /380/6/13 – SMIS Code: 123847.