

# Morphological Changes on *H-Ras* 5RP7 Cells Caused by Vanadyl Sulphate

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Vanadium, one of the trace elements with big importance for the nutrition of many species across the world [1]. Vanadium and its compounds have chemopreventive and antitumor effects *in vivo*, also *in vitro* on different types of malignant cells lines [2].

In the present study, the cytotoxic and apoptotic effects of  $\text{VO}_2\text{SO}_4 \cdot 5\text{H}_2\text{O}$  (vanadyl sulphate) on *H-Ras* transformed 5RP7 cells morphology was investigated using confocal microscopy.

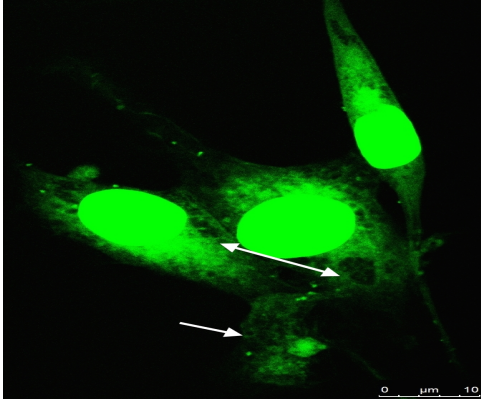
For confocal microscopy, the cells were seeded on cover slips ( $1 \times 10^4$  cells per well) in six well plate and treated with  $\text{IC}_{50}$  concentration of the agent, previously detected to be  $35 \mu\text{M}$  for 24 hours. At the end of incubation period, the growth medium was removed, coverslips were washed in phosphate buffered saline (PBS), fixed with HCl, washed again in PBS and finally stained with Alexa fluor-488 phalloidine. Stained cells were observed on confocal microscope and photographed.

On our results, condensed and fragmented nuclei and cells (Figure 1, Figure 3) and hole formation on the cytoskeleton (Figure 2), also damages on cell membrane (Figure 2) were detected as morphological changes on *H-Ras* transformed 5RP7 cells. According to our results vanadyl sulphate was found to be effective on changing cell morphology in low concentrations showing apoptotic sparks as above mentioned morphological changes.

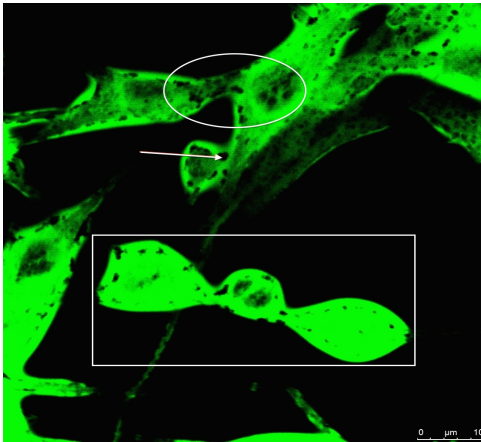
From our results, it can be concluded that vanadyl sulphate, with high effectiveness on changing the morphology of cancer cells and causing apoptosis, may serve as a model for drug desingning for cancer treatment.

## References:

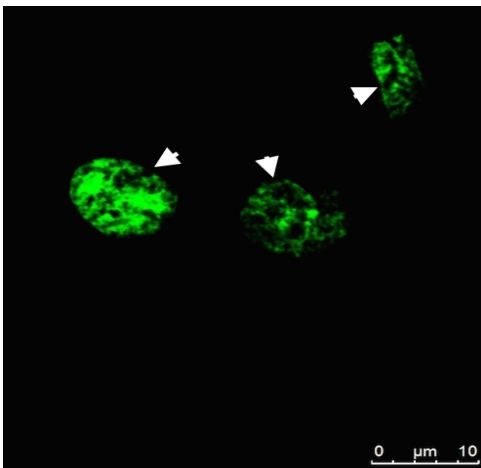
- [1]. A Bishayee, S Oinam, M Basu, M Chatterjee, Breast Cancer Res Treat **63** (2000), 133–145.
- [2]. J Kieler, A Gromek, NI Nissen, Acta Chir Scand **343** (1965), 154–164.



**Figure 1.** Confocal micrograph of *H-Ras* transformed 5RP7 cells treated with 35 $\mu$ M of vanadyl sulphate for 24 hours. Double head arrow: holes on cytoskeleton; arrow: fragmented cell.



**Figure 2.** Confocal micrograph of vanadyl sulphate treated 5RP7 cells. Circle: Holes on cytoskeleton; arrow: Condensed nucleus and hole on cytoskeleton; rectangle: condensed cell and nucleus, damaged membrane and deformed cell shape.



**Figure 3.** The nuclei of vanadyl sulphate treated cells (confocal micrograph). Arrow head: condensed and fragmented nuclei.