

Kaempferol, a powerful antioxidant from *Crocus Sativus L.* flowers: an in vitro study

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Recently, it has been demonstrated the presence of Kaempferol in the petals of *Crocus S.* flowers that are normally discarded [1]. Kaempferol is an important antioxidant of the flavonoid family. Numerous reports have shown that kaempferol and/or its glycosides induce cell death in a variety of cancer cells from different tissues, also it can slow skin aging by contrasting enzymes that degrade the extracellular matrix.

This antioxidant has been extracted from *Crocus S.* petals with different alcohols. Isolation and purification was done by flash column chromatography. Fractions were analysed by Thin Layer Chromatography (TLC). Kaempferol was further characterised by infrared (IR), mass spectroscopy (MS) and nuclear magnetic resonance (¹H & ¹³C NMR) spectroscopy. To be sure of the antioxidant property of the extracted Kaempferol, a DPPH test was performed.

In this experiment, it was used a new hydrogel consisting of three polymers - Polyvinyl pyrrolidone (PVP), Agar, Polyethylene glycol (PEG) – and Kaempferol, mixed, reticulated and then sterilized by gamma irradiation at 25 kGy. [2]. For the in vitro experimental protocol, it was used a primary culture of fibroblasts taken from the subcutaneous tissue of a newborn mice, seeding the cells on a little square (1cm² area) of the hydrogel with Kaempferol. As the ISO protocol prescribes, the experiments were repeated 3 times, stopping the culture at the 3rd, 7th and 14th day after the seeding. For all steps, 3 Petri dishes were used as controls without the biomaterial. At fixed deadline, all Petri dishes were stained, using the Wright method for cell counting and morphological evaluations. The microscopic analysis revealed the complete biocompatibility of the hydrogel. The Petri dishes with this kind of new hydrogel showed a production of collagen fibres similar of the Petri dishes without the hydrogel. The presence of this bioactive compound in saffron petals, paves the way of new possibilities for the best use of the *Crocus S.* hole flower.

References

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Keywords

Hydrogel, Kaempferol, *Crocus Sativus* Flowers, Antioxidant, NMR spectroscopy.