

Experimental facilities pave the rainbow access of the herbal melanin

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Abstract

Backgrounds: Melanin is a polymer found in most organisms acts as natural biological, antioxidants factor by reducing oxidative stress and inflammatory reaction of cells. It is playing a vital role as an antioxidant agent as well as its scavenging activities on free radicals. Also, melanin acts as immunoprotective polymers preventing the tissues and cells via its absorbable acts against ultraviolet and/or other radiation and thus prevents any injured of the cells. Recently, melanin has been extracted from the *Nigella sativa* seeds (NSM) and thus researched for biomedical applications such as natural protective agent with therapeutic effectiveness and targeted as a natural therapeutic or drug delivery. This work presents a general view of NSM extracts as a promising agent due to its therapeutic outcomes using in vivo and in vitro methods. Using of this type of melanin could play an important role through the biological needs and/or could pave the way as an active field of research including biochemistry, biomedical, dermatological, cosmetic therapies and microbiological points of view, as well as health care industry.

Methods: In the current study, the latest published works were studied to analyze the trend and pattern of the NSM extracts and the impacts of machine learning methods. Applications of histopathological methods and preclinical imaging computerized techniques such as computed tomography (CT) and nano CT Scans were also investigated for the prediction and interpretation of the amelioration effects of the NSM extracts via in vivo and in vitro clinical models.

Results: The results showed that NSM produced significant pathological and morphological changes in dose-and time-dependent manners in different organs architecture during both in vivo and in vitro experiments. In therapeutic development phases, it is well known the advantages of computerized data outcomes and it can be of importance related databases led to the success of the whole pharmacotherapy modalities and/or provide to the scientific field a new key transformative paradigms that can revolutionize the treatment of diseases and hence medical care.

Conclusion: Experimental in vivo and in vitro researches are valuable but also expensive and in some cases, researchers may suffer from limitations. But a well understanding of the therapeutic effects of this herbal extracts might pave the way and thus provides a robust means a better designing for much more effective natural medicinal agent or therapeutic products and also guarantees the patient safety.

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