

Methods: A systematic review of either published or e-published literatures from 1946 up to July-2016 was carried out using PRISMA guidelines. Scientific databases and search engines including MEDLINE, EMBASE, Ovid, PubMed, Scopus, ClinicalKey and ProQuest were searched systematically using key terms including “cancer”, “neoplasm”, “malignancy”, “carcinoma”, “tumor”, “metastasis”, “oxidative stress”, “free radicals”, “oxidant”, “brown”, “beige”, “brite”, “adipose”, “adipocyte” and “fat” in combination. This search was limited on English reported original research that were thoroughly appraised and included in this review.

Results: Some *in vitro* and *in vivo* studies met the selection criteria. The production of a significant amount of free radicals by uncoupling chain protein 1 (UCP1) in the BBAT mitochondria has frequently been investigated. This could be as the main contradiction of a hyperactive-BAT. Furthermore, the link between BBAT activity and risk of cancer has been reported in a limited number of observational studies, esp. with breast cancer. Hence, BAT hyperactivity has been reported to be accompanied by the browning process of white adipose tissue (producing beige fat) in some experimental and observational studies that could deteriorate cancer cachexia through increasing metabolism. The production of free radicals along with increasing metabolism and energy expenditure of the human body has been suggested as possible mechanisms.

Conclusion: It is concluded that although BBAT hyperactivity could have a potential role in carcinogenesis and cancer-induced cachexia, more human studies are required to focus on BBAT involvement in carcinogenesis.

38

COMPLICATIONS OF BROWN ADIPOSE TISSUE AND ITS ASSOCIATION WITH CARCINOGENESIS; A SYSTEMATIC REVIEW (PRELIMINARY DATA)

Neda Jourabchi-Ghadim,¹ Aydin Aynehchi,¹ Mehrangiz Ebrahimi-Mameghani².

¹Student Research Center, Tabriz University of Medical Sciences, Tabriz, Iran;

²Department of Nutrition and Biochemistry, Tabriz University of Medical Sciences, Tabriz, Iran.

10.1136/bmjopen-2016-015415.38

Background and aims: Recently, increasing Beige/Brown Adipose Tissue (BBAT) - a hyper-metabolic tissue in human body – has been a promising tool to combat metabolic diseases such as obesity, diabetes and metabolic syndrome, which are associated with some cancers. Therefore, it seems that increased BBAT could reduce cancer incidence, which it is not agreed with the results of a number of studies. By considering the findings of observational and experimental studies, we aimed to review existing evidence for the link between BBAT hyperactivity and carcinogenesis.