Abstract

INTRODUCTION: Caloric excess, including increased refined carbohydrate intake, is associated with higher cancer risk emphasizing the importance of improved understanding of cancer cell metabolism in tumor survival and metastasis.

AREAS COVERED: This article reviews the relationship between increased dietary refined sugar and cancer risk, with specific emphasis on the monosaccharide fructose. Cancer cell metabolism is reviewed, and the potential mechanisms by which dietary sugars contribute to the tumor microenvironment are discussed. Recent observations indicate that cancer cells readily utilize fructose to support proliferation and preferentially use fructose for nucleic acid synthesis. This review discusses the potential role of how dietary fructose can promote cancer growth by a variety of mechanisms, including altered cellular metabolism, increased reactive oxygen species, DNA damage and inflammation. Preliminary insights into potential therapeutic strategies by which fructose-mediated cancer effects may be abrogated are presented.

EXPERT OPINION: Other sugars (particularly fructose, given its abundance in the modern diet) must be considered with reference to cancer cell metabolism. Cancer cells utilize similar sugars in distinct ways, which may present important new therapeutic avenues of targeting cancer.