

# Fitting substrate provision and use to minimize carcinogenesis

## Abstract

Carcinogenesis is driven by genetic and epigenetic changes and also via gene expression dysregulations. This article innovatively elaborates on how mismatch in cell substrate provision and use triggers known and unknown carcinogenic mechanisms that could eventually cause cancer. Timely circadian nutrition and regular physical exercise may help minimize such a mismatch.

**Keywords:** Carcinogenesis, Synchrony, Substrate provision, Use, Epigenetics, Emphasizing, Analyzing, Ruminant, Irregularities, Synchrony, Mutagens, Nutritional, Oxidation, Secretion, Excretion

Volume 5 Issue 1 - 2016

**Akbar Nikkhah**

Department of Animal Sciences, University of Zanjan, Iran

**Correspondence:** Akbar Nikkhah, Chief Highly Distinguished Professor, Principal Highly Distinguished Elite-Generating Scientist, Department of Animal Sciences, Faculty of Agricultural Sciences, University of Zanjan, National Elite Foundation, Iran  
 Email anikkha@yahoo.com

**Received:** June 03, 2016 | **Published:** June 15, 2016

## Discussion

This article describes an association between synchrony of cellular substrate provision and use with carcinogenesis. Cancer is basically defined as amplified irregularities in cell physiology concerning divisions and resultant abnormal genetics, epigenetics, and omics.<sup>1-3</sup> There is a prospect that creating a harmony in substrate provision and use helps cells to be more biologically resistance to oncogenes.

Analyzing cancer in complicated ways may not allow its simplicity of action and expression to be manifest. In addition, emphasizing what can be accomplished in a life time to prevent or slow down carcinogenesis, is a key to demolishing cancer. Aside from keeping cells away from carcinogens such as viruses, bacteria, waves, and other environmental mutagens; nutritional programming and physical exercise are the most feasible means to help prevent and manage cancer.

On the basis of recent discoveries in ruminant animal models, shifting nutrient provision timing may allow optimizing substrate use efficiency and partitioning into oxidation, deposition, secretion, and excretion.<sup>4,7</sup> This implies that optimizing timing of food intake can effectively synchronize nutrient provision and use by splanchnic and peripheral cells. As such, creating optimal harmonies between substrate provision and use (i.e., oxidation) by timely nutrient intake and regular intense physical exercise should keep carcinogenesis from progress.

The main philosophy of this article is that since food is consumed regularly and thus nutrients are supplied to cells incessantly and regularly, substrate use and oxidation should follow similar rhythms. The timely energy expenditure and substrate oxidation should indeed be stimulated. This can be done with brain exercise and intense physical activity. This harmony in nutrient provision and use (oxidation) should preferably be established on circadian rhythms to allow superior cell efficiency in brain, heart, liver, kidney and muscles. Cooperatively, such harmonies will auspiciously influence aging for a higher quality lifestyle.

To elaborate on, individual and social differences exist in lifestyle. These include differences in nutritional programs, physical exercise intensity, workload, sleep duration and quality, exposure to stressors,

socioeconomic status, educational perception, and natural and environmental quality. Presently, no decisive quantitative proposal on cancer prevention may be prescribed for a global use. However, a state-of-the-art feasible guideline is to maximize matching the extent of nutrient provision with that of substrate use by differential cells. Such a fitting should be accomplished on a circadian basis. This may be done with timely circadian nutrition and regular physical activity.<sup>8,9</sup>

## Conclusion

In a global word, a simple but significant cause of genomic dysregulations is damaged by increased fitting of substrate provision and use in vital cells. Timely nutrition and regular physical activity of intense nature are considered pragmatic strategies that minimize the above mismatch in substrate supply and use. This could ensure maintaining regularities in cell physiology through lasting minimized substrate overload.

## Acknowledgments

Iran's Ministry of Science Research and Technology, and National Elite Foundation are acknowledged for supporting the author's global programs of optimizing science edification in the new millennium.

## References

1. Nikkhah A. Establishing rhythmic regularities in cell physiology: A novel global program to thwart cancer. *J Nutr Health Food Eng.* 2015;2(2):1-2.
2. Nikkhah A. NutriGenomics: An Epi-Innovative Science. Jahade Daneshgahi Publishing, Zanjan, Iran. 2013.
3. Kerr JF, Winterford CM, Harmon BV. Apoptosis. Its significance in cancer and cancer therapy. *Cancer.* 1994;73(8):2013-2026.
4. Nikkhah A. Timing of eating a global orchestrator of biological rhythms: dairy cow nitrogen metabolism and milk fatty acids. *Biological Rhythm Research.* 2014;45(5):661-670.
5. Nikkhah A. Eating time modulations of physiology and health: life lessons from human and ruminant models. *Iran J Basic Med Sci.* 2012;15(4):891-899.
6. Nikkhah A. Ruminant chronophysiological management: an emerging bioscience. *Open Access Animal Physiology.* 2011;3:9-12.

7. Nikkhah A. Chronophysiology of ruminant feeding behavior and metabolism:an evolutionary review. *Biological Rhythm Research*. 2013;44(2):197-218.
8. Nikkhah A. Running a pragmatic anti-cancer probiotic. *Journal of Probiotics & Health*. 2016;4:124.
9. Nikkhah A. Morning Eating and Evening Exercise:Towards an Anti-Cancer Lifestyle. *J Cancer Prev Cur Res*. 2016;4(4):1-2.