

Title: Ketogenic diet as an auxiliary treatment for cancer

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Abstract

Most solid cancer cells are characterized by the Warburg effect, a biochemical phenomenon in which cancer cells predominantly utilize glycolysis instead of oxidative phosphorylation (OXPHOS) for producing energy and building blocks for maintaining continuous cell proliferation. Due to the high glucose dependency of tumor cells combined with a decreased capacity to utilize alternative substrates via OXPHOS, certain dietary interventions such as the ketogenic diet (KD) - a high fat/low carbohydrate diet could sensitize them to classical cancer therapies. Owing to the KD's low carbohydrate content, the KD provokes the reduction of circulating glucose, consequently lowering insulin and IGF-1 levels. Insulin and IGF-1 receptor signaling pathways are significantly involved in tumorigenesis. Our present as well as previous mouse studies show that the KD successfully target different types of cancer such as neuroblastoma (NB), breast cancer (BC) and melanoma (MEL). However, the KD could be deleterious in the treatment of certain types of cancer with cancer-related anorexia/cachexia syndrome and/or paraneoplastic syndrome, as we observed with renal cell carcinoma. Our molecular investigations suggest that the KD targets cancer cells through various mechanisms such as reducing angiogenesis, inducing energy stress, altering the lipid and metabolite signature systematically and in the tumor tissue. Our studies indicate that the KD could be considered as part of multimodal therapy for NB, BC and MEL.



Speaker Biography:

Sepideh Aminzadeh-Gohari completed her bachelor's and master's degree in cell & molecular biology in Iran and subsequently worked in the industry for 4 years. To continue her education, in 2013, she moved to Austria and obtained her PhD in 2019 on "Ketogenic diet as an adjuvant cancer therapy with major focus on neuroblastoma" in the laboratory of Prof. Barbara Kofler at the University Hospital of the Paracelsus Medical University in Salzburg. She has 15 publications and a young research grant for the metabolic targeting of melanoma, in vitro. At present, she is a Post-Doc in the Research Program receptor biochemistry and tumor metabolism.

Abstract Citation:

[World Congress on Cancer and Diagnostics](#)

Frankfurt, Germany- June 15-16, 2020