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Transcription factor-targeting decoy peptides: A new strategy for cancer treatment

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Our work provides a rational approach to targeting several transcription factors at once that have essential roles in tumor cell survival [1-4]. This approach focused on decoy peptides containing a penetratin domain followed by the leucine zipper domains of transcription factors CEBPB and CEBPD. These peptides, named as Bpep and Dpep, killed a range of cancer cell types in culture and in animals. In mouse tumor xenograft models, they also significantly increased survival time. In contrast, they did not affect the survival of non-cancer cells and had no apparent side effects in animals. Moreover, these peptides worked additively to synergistically in combination with other conventional anti-cancer treatments. Mechanism studies showed that these peptides could trigger apoptosis through the depletion of pro-survival survivin and a required elevation of pro-apoptotic BMF. In addition, they disrupted both aerobic glycolysis and oxygen consumption rate. Accordingly, TXNIP knockdown, which interferes with glycolysis, diminished apoptosis induced by these peptides. Overall, our work supports the potential of Bpep and Dpep as novel, safe agents for the treatment of a wide variety of solid tumors, both as mono- and combination therapy.

Biography

Dr. Qing Zhou received her Ph.D. in Pharmacology from Tsinghua University, China, for her work on cancer drug resistance. She pursued her postdoctoral training at Washington State University, focusing on telomere maintenance and genome integrity in cancer. Currently she is an Associate Research Scientist in the Department of Pathology and Cell Biology at Columbia University Medical Center, and dedicated to the development of new strategies targeting transcription factors for cancer treatment. Dr. Zhou has been actively involved at regional, national, and international levels in cancer research. She has extensive experience in the identification of novel anti-cancer therapeutics and the investigation of their mechanisms at the preclinical level. Her major research interest is to discover and translate promising therapeutic drug regimens into the clinic to help patients fight cancer.