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Searching for the magic bullet against cancer: the butyrate saga

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Abstract

n-Butyric acid and its "polymorphic" derivatives have been largely but somehow "blindly" studied in oncology and in red cell diseases with consistent results through decades indicating a strong maturative effect determined by enhancement of gene transcription. Although these effects have been observed mainly in vitro, the relative absence of systemic toxicity of butyrates render these compounds appealing as specific therapeutic agents. More interestingly, their specific mechanism of action, i.e. inhibition of histone deacetylase and de-repression of transcription represents at present an unique tool for diseases such as acute leukemias which are characterised by a disregulation of co-repressors and co-activators of gene transcription. More insight into specificity and modalities of action of different butyrate derivatives may be a guarantee for excellent tailored antileukemic therapy in the future.

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