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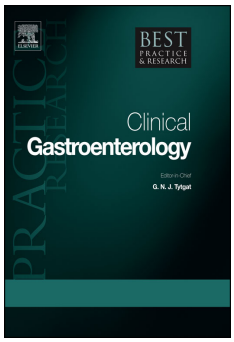

Intervening in disease through genetically-modified bacteria

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Intervening in disease through genetically-modified bacteria

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Abstract

The comprehension of the molecular basis of different diseases is rapidly escalating due to technological approaches. Consequently, proteins which could possibly be used in therapeutics, including cytokines and signalling molecules have been identified in the last decades. However, there are some disadvantages regarding functional and economic considerations of the clinical use of these discovered proteins . One of the most important consideration is the delivery and also the synthesis of such proteins. Recently, the idea of using genetically modified bacteria has emerged as an attempt to evade important barriers. Therapeutic proteins are frequently purified, by a very expensive methodology, in order to become endotoxin-free. Then, these proteins are systemically distributed by a suitable transporter into the circulation. The main disadvantages of this conventional strategy are the side effects resulted from the systemic administration of the proteins, besides the high production costs, as previously mentioned. Once it is well known that genetically modified (GM) bacteria can co-exist with humans, and then produce viable human therapeutic proteins, innovative methodologies for those who are suffering from disease conditions have emerged: the delivery of proteins in the tractus for example (e.g., intestinal tract) avoids the necessity of endotoxin-free preparations. Taking into consideration the production of recombinant proteins by bacteria by a cheap technique and the possible treatment of diseases related to digestive tract, the delivery of such proteins could be topical instead of systemic. Thus, recent findings on the roles of the human gut microbiome in health and diseases have stimulated novel