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Bismuth-NSAIDs as colorectal cancer chemopreventives

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To date, epidemiological studies, animal studies and clinical trials have indicated the potential of non-steroidal anti-inflammatory drugs (NSAIDs) for the chemoprevention of colorectal cancer (CRC) [1]. Unfortunately, the use of NSAIDs for CRC chemoprevention is significantly limited due to the severe gastrointestinal (GI) side effects that have been associated with their long term use [1]. It is hypothesised that the coordination of NSAIDs to bismuth, a heavy metal with proven gastrointestinal sparing properties [2], may allow the use of NSAIDs as chemopreventives for CRC while also combating their associated GI side effects. The present study investigates the interactions of bismuth-coordinated NSAIDs (BiNSAIDs) with eukaryotic membrane mimics with the aim of establishing the possible uptake mechanisms of these compounds. This knowledge will be extended by investigating the behaviour of BiNSAIDs in more complex systems, including CRC cells and a CRC animal model.

QCM-D studies involving biological membrane mimics composed of POPC or POPC/cholesterol demonstrated that BiNSAIDs and their parent NSAIDs interact with biological membranes [3]. Neutron reflectometry was also used to study the membrane interactions of BiNSAIDs and provided further evidence of the membrane interactions of BiNSAIDs, suggesting that passive diffusion is a likely method of uptake of these compounds [3]. These strength of these membrane interactions was an indicator of BiNSAID cytotoxicity against CRC cells.3 A CRC animal study has recently been completed with aspirin, which has promising preliminary results. In conclusion, the aforementioned studies continue to highlight the potential of BiNSAIDs as candidates for further investigations into their potential for the chemoprevention of CRC.

References
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Topic

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