A new microbial innovation for fighting cancer

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Résumé

Bacterial biofilm formation and metastatic progression are very similar biological processes in terms of mechanisms. These include mechanisms such detachment, entry into the bloodstream, and colonisation of other sites, leading to the hypothesis that these mechanisms may be regulated by common chemical mediators. These striking parallels in biology between cancer and bacteria forming biofilms are inspiring and reinforce the hypothesis that anti-growth and anti-biofilm strategies could help improve the therapeutic management of cancer. Our objectives are to assemble several marine bacterial strains in consortium and to evaluate the anti-tumor properties of the metabolites secreted (secretomes) by these consortia on breast cancer cells. Strains were assembled into several consortia and cultivated at 22∘C for the bioproduction of their secretomes. Secretomes anti-tumor properties were evaluated in vitro on two types of breast cancer cell lines: MCF-7 mimicking the luminal subtype and MDA-MB-231 mimicking the basal-like subtype, more commonly known as triple negative and still today in a therapeutic impasse. Each bacterial secretome was tested at four concentrations on the viability of these two breast cancer cell lines, and of a non-cancerous cell line for control, using the MTT assay. Most of the metabolites secreted by these consortia showed dose-dependent effects on cancer cell lines, and interestingly, some exhibited an enhanced ability to affect specifically triple negative cancer cells viability. This study provides the first evidence that assembling bacteria pre-selected for key functions into consortia could constitute new microbial innovations to fight cancer.

Mots-Clés: Bioinspiration, bacteriotherapy, marine bacteria, antitumor metabolites, breast cancer

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