Could a newly-discovered bacteria contribute to cancer?

For many years, doctors and scientists have known that certain viruses, such as human papilloma virus (HPV), are capable of causing cancer. Until recently, bacteria were ignored as potential carcinogens. This changed with the discovery that Helicobacter pylori causes both ulcers and stomach cancer. One form of stomach cancer, MALT lymphoma, can usually be treated with antibiotics instead of chemotherapy. H. pylori was not discovered until 1982 and earned its discoverers, Barry Marshall and Robin Warren, the 2005 Nobel Prize in Physiology or Medicine. Bacteria are now believed to play important roles in the development of colon cancer, but determining which bacteria are “good” and which are “bad” has been difficult because there are thousands of species present in the colon.

An unusual type of cancer called pseudomyxoma peritonei (PMP) may provide answers. PMP begins as a mucus-secreting tumor in the appendix. The appendix ruptures; however the thick mucus keeps most bacteria from entering the abdominal cavity. Therefore, patients do not develop infections. The appendix then heals, leaving behind tumor cells that grow and fill the abdominal cavity with mucus, leading to PMP’s nickname, “jelly belly”. Certain bacteria, including H. pylori, are commonly associated with PMP. Higher bacterial densities are associated with more aggressive tumors. Moreover, a small clinical trial suggests that treatment with certain antibiotics reduces the number of tumor-associated bacteria, leading to signs of reduced tumor aggressiveness and longer patient survival.

We have cultured several species of bacteria from PMP tumors and are testing them to determine whether they contribute to tumor growth or mucus secretion. The genome of one strain, designated PMP191F, was sequenced and found it to be a completely new species belonging to the Chitinophagaceae family. Its closest relatives are the environmental organisms Chitinophaga pinensis and Niastella koreensis, yet similar organisms are common in PMP tumors. Ongoing research should clarify the roles of this and other bacterial species in cancer. One day, it may be possible to prevent or treat several types of cancer with antibiotics.

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A Novel Member of Chitinophagaceae Isolated from a Human Peritoneal Tumor.
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