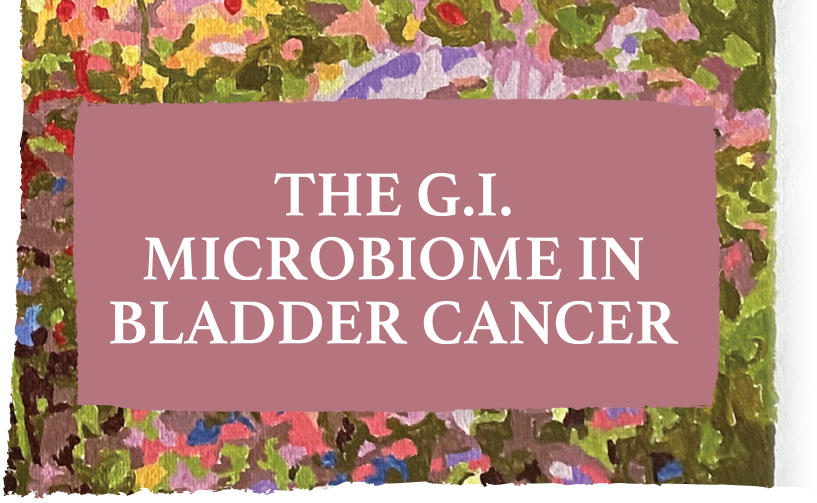
Healing Cancer at the Root
HYPERION
Functional Medicine



THE G.I. MICROBIOME IN BLADDER CANCER

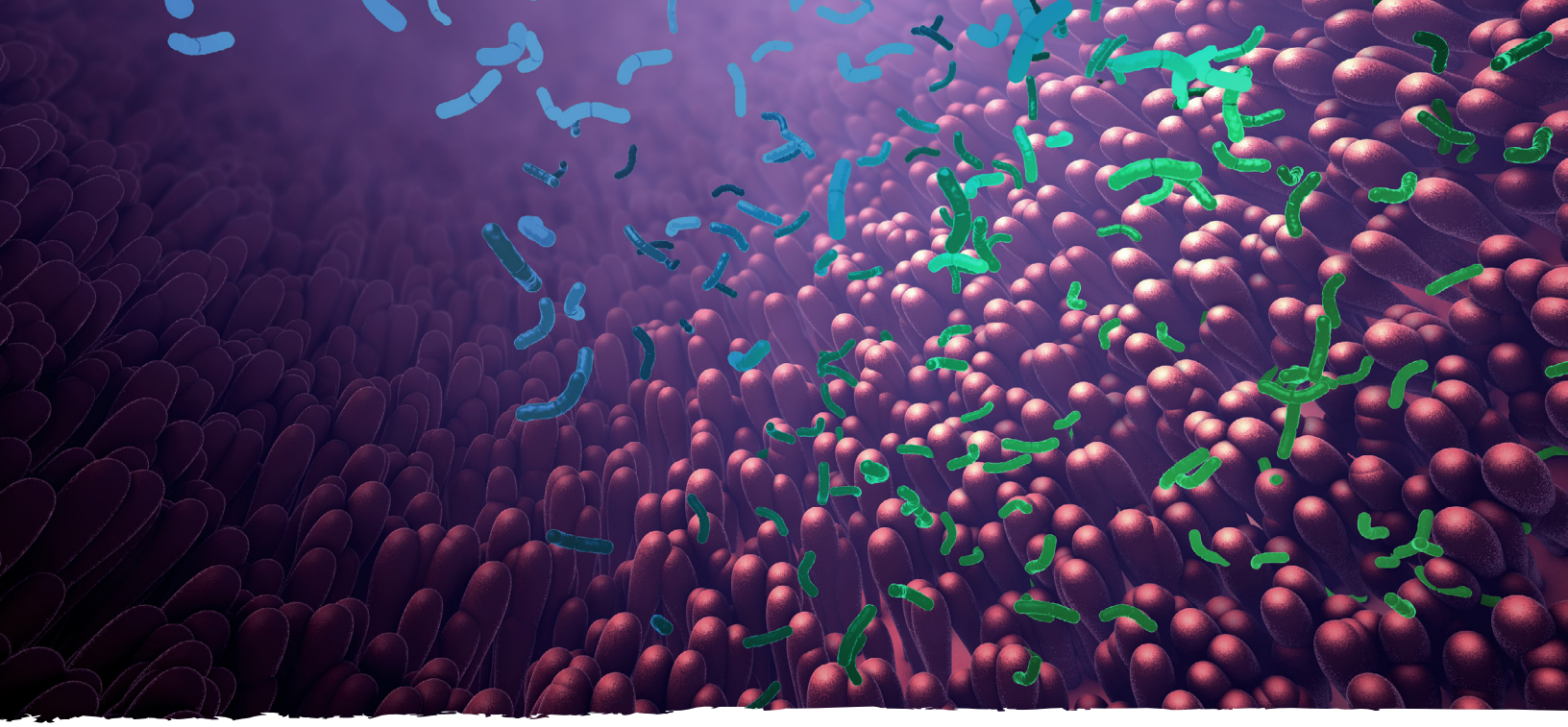
Bladder cancer is one of the most frequently diagnosed cancers in the world. Nearly 500,000 people each year are diagnosed with bladder cancer, and more than 1/3 of them die from the disease. There are several pathological types, these include urothelial carcinoma, squamous cell carcinoma and adenocarcinoma, among which urothelial carcinoma is the most common pathological type. The cause of bladder cancer is multifactorial, the best documented risk factors include smoking, administration of cyclophosphamide or pioglitazone, occupational exposure to amines and aromatic hydrocarbons, and history of radiotherapy[1]. The impact of toxins on bladder cancer is further detailed under the Toxic Exposures root of cancer.

Bladder cancer patients have been found to have dysbiosis in the G.I. tract as well as specific decreased metabolites and damaged intestinal structural integrity[2].

Medical research on intestinal flora has discovered that bladder cancer patients exhibit reduced serum vitamin A levels (B-Carotene) and GI Dysbiosis. When looking at this relationship, there is speculation that a complex regulatory mechanism exists between the two in the development and occurrence of bladder cancer. When consuming fruits or vegetables rich in B-carotene, the compounds must undergo various physical and chemical metabolic processes in the digestive tract in order to enter the bloodstream and eventually be transported to target cells[3]. A healthy gut is required to absorb nutrients integral to healing cancer.

The inflammatory state of the G.I. system driven by dysbiosis increases the risk of a leaky gut allowing microbes, food particles, and toxins to leak out from the intestine itself into the bloodstream. This creates a chronic inflammatory response that affects many systems in the body. The stress on healthy cells from chronic inflammation increases the risk of damage to their DNA and can lead to cancer cell development and cancer cell proliferation.

An additional microbiome which is an important consideration in bladder cancer patients is in the urinary tract. Dysbiosis of the urinary microbiome can create a chronically inflammatory urothelial microenvironment that can lead to bladder cancer much like the G.I. microbiome dysbiosis. Studies have found that urine samples from bladder cancer patients have different species of bacteria than healthy individuals. One study developed a model using the bladder mucosa microbiome to distinguish bladder cancer status[4].



Bacteria in the gut send signals to the mitochondria, this has been observed to alter mitochondrial metabolism, activate immune cells, induce inflammation, and alter the intestinal barrier. Dysbiosis of the microbiome in the gut and the resulting mitochondrial dysfunction are associated with chronic intestinal inflammation and cancer[5].

A comprehensive stool analysis is essential to evaluate the health of the cancer patient's microbiome and the overall function of the G.I. system. Hyperion functional medicine uses stool testing in patients who are in the Phase 1 Functional Oncology1 Program. The G.I. stool test is used to evaluate the microbiome for dysbiosis, immune dysfunction, inflammatory markers, bacterial metabolite deficiencies, infectious bacteria, yeast, parasites, and overall microbial diversity.

A detailed and stepwise functional treatment plan is made based on the results of the stool test which may include prescribed beneficial probiotics or prebiotic's, G.I. specific nutritional recommendations, pharmaceutical grade supplements to reduce inflammation as indicated, and botanical antibiotic treatment remedies based on the microbiome testing results.

CANCER ROOTS
Collaborating for a Cure

In partnership with healingstrong

1 Chorbińska J, Krajewski W, Nowak Ł, Bardowska K, Żebrowska-Różańska P, Łaczmański Ł, Pacyga-Prus K, Górska S, Małkiewicz B, Szydełko T. Is the Urinary and Gut Microbiome Associated with Bladder Cancer? Clin Med Insights Oncol. 2023 Nov 13; 17:11795549231206796. doi: 10.1177/11795549231206796. PMID: 38023290; PMCID: PMC10644734.

2 He C, Li B, Huang L, Teng C, Bao Y, Ren M, Shan Y. Gut microbial composition changes in bladder cancer patients: A case-control study in Harbin, China. Asia Pac J Clin Nutr. 2020;29(2):395-403. doi: 10.6133/apjcn.202007_29(2).0022. PMID: 32674247.

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4 Friedrich V, Choi HW. The Urinary Microbiome: Role in Bladder Cancer and Treatment. Diagnostics (Basel). 2022 Aug 26;12(9):2068. doi: 10.3390/diagnostics12092068. PMID: 36140470; PMCID: PMC9497549.

5 Jackson DN, Theiss AL. Gut bacteria signaling to mitochondria in intestinal inflammation and cancer. Gut Microbes. 2020 May 3;11(3):285-304. doi: 10.1080/19490976.2019.1592421. Epub 2019 Mar 26. PMID: 30913966; PMCID: PMC7524274.