In order to develop more effective treatments for inflammatory bowel disease (IBD) with fewer side effects, a better understanding of which cells are responsible for the initiation of inflammation is vital. Herein, we demonstrate that a rare subset of dendritic cells expressing CD8α is present in significantly different numbers in mouse strains considered susceptible or resistant to a microbially induced model of IBD. Additionally, we show that cells derived from the target organ of susceptible mice prior to and shortly after induction of the disease process are prone to production of greater levels of certain inflammatory mediators including IL-12/23p40, IP-10, RANTES, and TNF-α. Lastly, we describe the generation of a mouse strain susceptible to the disease model but selectively lacking the subset of dendritic cells expressing CD8α, to be used in future studies.

One of the most serious sequela to IBD is colitis-associated colorectal cancer (CAC). We report here the development of a novel screening technique capable of detecting the earliest stages of CAC in a microbially induced mouse model. Using fecal gene expression-based biomarkers, i.e., rRNA derived from colonocytes sloughed in the feces, we were able to accurately predict which mice would develop CAC several weeks later, as well as predict the severity of disease. While the optimal markers of disease identified in the present studies, IL-1β and MIP-1α, are likely specific to this model of CAC, the proof-of-concept portends a powerful new method of diagnostics for CAC in humans.