Abstract:

Dietary intake of cruciferous vegetables (eg. Broccoli, Cabbage, Brussels sprouts) correlates with decreased incidences of heart disease, type-2 diabetes, and various cancers. Secondary metabolites, such as glucobrassicin, found in broccoli (*Brassica oleracea*) have been investigated as the putative mediators of the beneficial health attributes through modifications of cellular processes and the resident microflora. Upon consumption, glucobrassicin is enzymatically cleaved, generating the phytochemical indole-3-carbinol (I3C), which may undergo further gastric acid condensation in the stomach to generate multiple biologically active compounds. Such endogenous derivatives of I3C, including indolo[3,2-b]carbazole (ICZ), activate the aryl hydrocarbon receptor (AHR). Administration of AHR ligands, including I3C, is demonstrated to significantly alter the composition of intestinal microflora. Currently, it has not been determined if the positive action of broccoli and its constituents are mediated through alterations of AHR signaling pathways and subsequent changes in intestinal microbial populations. We hypothesize that broccoli can beneficially alter the intestinal microbiota of mice and that such alterations are mediated in part through host AHR signaling via in situ generation of broccoli-derived AHR activators. In this study we aim to characterize the changes in the microflora mediated by dietary broccoli through AHR dependent and independent mechanisms through 16S RNA sequencing.