**Supplementary Figure Legends**

**Supplementary Figure S1**. Administration of celecoxib alters the luminal metabolome of WT mice. Feces were collected at baseline (0 weeks) then again at 5 and 10 weeks after initiating celecoxib treatment. Fecal extracts were subjected to targeted metabolomic analysis to determine relative metabolite levels. Heat maps of significantly altered metabolites were generated by comparing the metabolite changes of feces from WT mice given celecoxib to mice given control diet. A, Amino acids and Dipeptides. B, Lipids. C, Nucleotides. D, Additional Metabolites. Each column represents an individual sample. Data are rank transformed and displayed as color intensity with low levels indicated by green color and high levels indicated by red color. Metabolites in different metabolic pathways are color coded as follows: Red font = amino acid, brown font = dipeptides, dark blue font = lipids, green font = nucleotides, purple font = carbohydrates, light red font = cofactors and vitamins, black font = energy and orange font = xenobiotics. The metabolite categories described above were broadly defined to include related metabolites.

**Supplementary Figure S2**. Pathway alterations associated with celecoxib-induced metabolite changes in WT mice. The metabolomic changes induced by celecoxib treatment in WT mice were analyzed by IPA. A, The top 5 diseases in the “Cancer” category that are associated with the metabolites altered by celecoxib treatment are shown. B, The direction of change (red = increased; green = decreased; color intensity reflects magnitude of change) for the metabolites altered by celecoxib that corresponded mostly to decreased proliferation of cells are shown. Blue dashed line = predicted inhibition; yellow dashed line = findings inconsistent with state of downstream molecule; gray dashed line = effect not predicted.

**Supplementary Figure S3.** Celecoxib treatment reduces proliferation in the base of ileal and colonic crypts from WT mice. The percent of Ki-67 positive cells in the entire crypt, base and non-base were quantified in the ilea (A) and colons (B) of WT mice given control or celecoxib diet (n = 4-5 per group).