

Supplementary data figure legends

Supplementary figure 1. Representative appearance of salmonid liver tumors as observed in the study groups. (A) Gross pathological image of an affected liver shows multiple, whitish nodules on the cut surface. (B) A PCNA stained whole-mount section of a liver shows strong immunoreactivity in the nodules, particularly in their periphery. *Bar*, 0.5 cm.

Supplementary figure 2. Micrographs of salmonid gastrointestinal epithelial dysplastic changes and adenocarcinoma. (A) Marked epithelial proliferation and altered morphology of the folds with intrafold epithelial coalescence (bridging) in folds adjacent to adenocarcinomas in the June samplings. HE staining. *Bar*, 200 μm . (B-F) Dysplastic changes varied from mild to severe and *in situ* carcinoma could also be observed. Marked distinction between more normal-appearing enterocytes and enterocytes with severe dysplasia (arrow), HE staining. *Bars*, 50 μm , and for F, 100 μm (G) Dissociated tumor cells in the lamina propria of a moderate change. Pancytokeratin immunostain. *Bar*, 100 μm . (H) MHC class II⁺ cells (red staining, tumor cells indicated by arrow). MHC class II immunostain. *Bar*, 50 μm . (I) Abundant cells with yellow cytoplasmic granules (mast cell homologues, identical to eosinophilic granular cells in HE sections) are seen in intimate connection with tumor cells (arrow). MSB staining. *Bar*, 50 μm .

Supplementary figure 3. Inflammation and carcinogenesis in the salmonid gut. (A) Chronic inflammation, epithelial dysplasia and early tumor invasion in an elevated area. HE staining. *Bar*, 100 μm . (B) Invasion of tumor cells in a submucosal vessel. Fibrin clot (red), scarce orange nucleated erythrocytes and vessel wall surrounded by tumor cells and cells with yellow cytoplasmic granules (mast cell homologue). MSB staining. *Bar*, 20 μm . (C) Well-advanced tumor with abundant cytokeratin positive cells and a gradually thinner *stratum compactum* towards the centre. Pankeratin immunostain. *Bar*, 400 μm . (D,E) Cancer cell

penetration, frequently arranged in trabeculae (arrows) through the *stratum compactum* (sc). MSB and cytokeratin AE1 immunostain. *Bars*, 50 μm . (F) Dispersed tumor cells and tumor cells in clusters, some with a signet ring appearance in the lamina propria. AE1 immunostain. *Bar*, 50 μm . (G,H) Mucin-containing cells and vacuoles in a well-advanced tumors. HE staining and PAS staining. *Bars*, 100 and 200 μm . (I) Abnormal glandular structures (strongly red) within a well-advanced tumor. Cytokeratin AE3 immunostain. *Bar*, 400 μm .

Supplementary figure 4. Micrographs of metastases of adenocarcinoma in salmonids. (A) Liver tumor containing small, variably sized vacuoles. HE staining. *Bar*, 200 μm . (B,C) High magnification with PAS positive vacuoles and signet-ring cells. PAS staining. *Bars*, 20 μm . (D) Peripheral blood with abundant dispersed cytokeratin positive single or clustered cells. Fish erythrocytes are nucleated. Pankeratin immunostain. *Bar*, 30 μm . (E) Invasive front of a liver tumor (arrow) and tumor cells scattered in a larger blood vessel. Cytokeratin AE1 immunostain. *Bar*, 200 μm . (F) Cardiac metastasis with some PAS positive cells in the *stratum spongiosum* of the ventricle. PAS staining. *Bar*, 40 μm .