**Supplementary Figure 1** (Fig. S1)

(A-B) Schematic representation of the experimental design used for *in vitro* experiments with Caco-2 and HCT116 cells (A) and for *Drosophila melanogaster* guts.

**Supplementary Figure 2** (Fig. S2)

(A-B) Transmission electron microscopy images of E551 (A) and E171 (B). E551 and E171 were suspended in ultrapure water using vortex (A) or sonication (B). (C-D) Size distribution of E551 (left in C), E171 (right in C) and physico-chemical characteristics of E171 and E551 suspensions in water (D) determined by dynamic light scattering on a nanoZS ZetaSizer.