**Extended Data Video and Table Legend**

**Extended Data Video 1: 3D profile of GFP and Tomato signals in Matrigel transplants.** GFP+ cells are derived from “young” APCs, and Tomato+ cells are derived from “aged” APCs. Detailed information is described in Fig. 2a.

**Extended Data Video 2, 3: 3D profile of Tomato signals in Matrigel transplants.**

**2**, Tomato+ cells derived from “young” APCs; **3**, Tomato+ cells derived from “aged” APCs. Detailed information is described in Fig. 2g.

**Extended Data Video 4, 5: 3D profile of Tomato signals in Matrigel transplants.**

**4**, Tomato+ cells derived from “young” APCs transplanted to young recipients; **5**, Tomato+ cells derived from “young” APCs transplanted to aged recipients. Detailed information is described in Extended Data Fig. 3a.

**Extended Data Video 6, 7: 3D profile of GFP signals in Matrigel transplants.**

**6**, GFP+ cells derived from “young” APCs transplanted to young recipients; **7**, GFP+ cells derived from “young” APCs transplanted to aged recipients. Detailed information is described in Extended Data Fig. 3c.

**Extended Data Video 8, 9: 3D profile of Tomato signals in Matrigel transplants.**

**8**, Tomato+ cells derived from “young” ASC cells; **9**, Tomato+ cells derived from “aged” ASC cells. Detailed information is described in Fig. 4h.

**Extended Data Video 10, 11: 3D profile of Tomato signals in Matrigel transplants.**

**10**, Tomato+ cells derived from enriched “young” CP-1 cells; **11**, Tomato+ cells derived from enriched “aged” CP-A cells. Detailed information is described in Fig. 4h.

**Extended Data Table 1:** **Pathways enriched in the “aged” ASCs compared to the “young” ASCs.**

**Extended Data Table 2: Pathways enriched in the age-specific CP-A population.**