

Supplementary figure 1: Gating strategy for analysis and isolation of CSC populations.

Dissociated single cells from freshly isolated tumors or primary cells were stained and sorted for respective populations. **(A)** Gating strategy for Lin-CD24⁺ populations from primary tumors cells. **(B)** Gating strategy for isolating P0: ALDH⁻ Non-CD29^{hi}CD61⁺, P1: ALDH⁻ CD29^{hi}CD61⁺, P2: ALDH⁺ Non-CD29^{hi}CD61⁺ and P3: ALDH⁺ CD29^{hi}CD61⁺ cells.

Supplementary figure 2: Tumors that arise from transplanted sorted populations recapitulate features of parental tumors.

Histological sections of transplanted P0, P1, P2 and P3 tumors from **(A)** PyMT or **(E)** Wnt tumors. Scale bar represents 200 μ m. Growth curves of transplanted P0, P1, P2 and P3 tumors from **(B)** PyMT or **(F)** Wnt tumors. ALDH⁺ populations in transplanted P0, P1, P2 and P3 tumors from **(C)** PyMT or **(G)** Wnt tumors. CD29 CD61 profiles of transplanted P0, P1, P2 and P3 tumors from **(D)** PyMT or **(H)** Wnt tumors.

Supplementary figure 3: Tumors that arise from transplanted sorted populations display Stat3 and Smad2 activation.

Histological sections of transplanted P0, P1, P2 and P3 tumors immuno-stained with **(A)** p-Stat3 or **(B)** p-Smad2.

Supplementary figure 4: Inhibition of autophagy after FIP200 deletion.

Immuno-blots showing FIP200, p62, LC3 I, LC3 II and actin levels in vehicle control (VC) or 4-OHT treated *FIP200^{ff}*;PyMT;CreER cells with or without 200nM Bafilomycin A1 under **(A)** normal culture conditions or **(B)** sphere culture conditions.