**Legends, supplementary material**

**Supplementary Table 1. Structure and IC50 value of compounds confirmed as positive Msi1 inhibitors by NMR.** NMR analyses were conducted to confirm whether the identified compounds (by fluorescence polarization competition assay) bind to Msi1 and if the binding disturb the RNA binding residues. Six compounds (luteolin, morin, aurincarboxylic acid, myricetin, tryphostin-51 and piceatannol) were confirmed as positive for interaction with Msi1 RNA binding domain.

**Supplementary Table 2. Results of combined treatment, luteolin and radiation.** U251 and U343cells were treated with radiation and/or luteolin and impact on proliferation and colony formation were determined. **A)** Results of proliferation assay.Cell confluence at the time point 108h for U251 cells (192h for U343) was used to calculate the combination index (CI) and determine treatment synergism. **B)** Colony formation assay. Relative OD560nm of extracted colonies with acetic solution was used to calculate the combination index (CI) and determine if treatments had synergistic effect. CI<1 means synergism.

**Supplementary Table 3. Results of combined treatment, luteolin and olaparib.** U251 and U343cells were treated with olaparib and/or luteolin and impact on proliferation and colony formation were determined. **A)** Results of proliferation assay.Cell confluence at the time point 120h for U251 cells (180h for U343) was used to calculate the combination index (CI) and determine treatment synergism. **B)** Colony formation assay. Relative OD560nm of extracted colonies with acetic solution was used to calculate the combination index (CI) and determine if treatments had synergistic effect. CI<1 means synergism.

**Supplementary Table 4. Luteolin analogs analyzed by fluorescence polarization competition assay.** Nine analogs of luteolin were selected from differentvendors (AK scientific. Inc, Matrix scientific, Cambridge chemicals) to be analyzed by fluorescence polarization to determine interaction with Msi1 RBD1. Table lists IC50 value (M) obtained in each case.