**Supplementary Figure**

**Figure S1.** WNT5A suppresses EGFR-mutant NSCLC cells growth. **a**&**b** The expression for WNT5A detected by qRT-PCR and western blotting in H1299 and HCC827 cell transfected with WNT5A or Mock. **c&d** tumor weight at the end points of xenografts formed by subcutaneous injection of H1299 and HCC827 cells stably transfected with mock and WNT5A lentivirus into the dorsal flanks of nude mice (n = 4 for each group). \**P* < 0.05 vs. mock.\*\**P* < 0.01 *P* value was calculated by one-way ANOVA test.

**Figure S2.** E2F1 negatively regulated the expression of WNT5A. **a** Kaplan-Meier curves indicating the overall survival of NSCLC patients with different transcription factors expression, including AP-1 (P<0.05), NF-κB (P>0.05), PAX2 (P>0.05), POU2F1 (P<0.05). log-rank test. **b** Analyze the correlation between the expression of AP-1 and WNT5A (R = 0.06, P = 0.429) (upper), POU2F1 and WNT5A (R = -0.46, P <0.0001) (lower) using public datasets of tumor lung (NSCLC) (GSE33532) Pearson’s product-moment correlation analysis. **c** Real-time qPCR showing the transcript levels of E2F1 (normalized to GAPDH) in H1975 and HCC827 cells stably transfected with E2F1 and sh-E2F1(#1, #2), compared with mock and sh-Scb (mean ± SD, n = 5). **d** Western blot showing the protein levels of E2F1 (normalized to GAPDH) in H1975 and HCC827 cells stably transfected with E2F1 and sh-E2F1(#1, #2), compared with mock and sh-Scb (mean ± SEM, n = 5).Student’s t test analyzed the difference in d. \**P* < 0.01 *P* value was calculated by one-way ANOVA test.

**Figure S3** E2F1 inhibitor the WNT5A activity and facilitate downstream genes expression. **a** The two potential detail sequences of E2F1 binding to the promoter of WNT5A. **b** ChIP assay using E2F1 antibody indicating the endogenous binding of E2F1 to the promote of WNT5A in H1299 and HCC827 cells. The IgG antibody was taken as negative control and the H3 histone antibody was taken as positive control. **c** Dual-luciferase assays showing the promoter activity of WNT5A in 293T cells, and their changes in those stably transfected with mock, E2F1, sh-Scb, sh-E2F1 #1 and sh-E2F1 #2 (mean ± SEM, n = 4). Student’s t test analyzed the difference in d. \**P* < 0.05, \*\**P* < 0.01, \*\*\* *P*< 0.001. pvalue was calculated by one-way ANOVA test. **d** The expression for β-catenin detected by western blotting in H1299 and HCC827 cell transfected wit WNT5A or Mock. **e** The expression of target genes was determined in H1975 and HCC827 cell with Ly294002 (10.0 μM) by qRT-PCR. **f** TOP/FOP flash assay indicating the β-catenin activity in H1975 and HCC827 cells transfected with WNT5A and in those treated with solvent control (DMSO) or Ly294002 (10.0 μM) for 24 hours. **g** The expression of indicated molecules was determined in H1975 and HCC827 cell treated with Ly294002 (10.0 μM) for 48 hours by Western blotting. Data shown were the average of three independent experiments with similar results.The data are presented as the mean ± SEM, *P* values as determined by the t-test.