

Supplemental Figure Legends

Supplemental Figure 1. (A) qRT-PCR analysis of the expression of Brd4, Brd2 and Brd3 mRNA in postnatal *Pkd1* heterozygous PH2 (PH2) cells and *Pkd1* homozygous PN24 (PN24) cells. * $p < 0.05$. (B-C) qRT-PCR analysis of the expression of Brd4 mRNA in postnatal day 28 kidneys from *Pkd1*^{+/+} (WT) (n = 4) and *Pkd1*^{nl/nl} (nl/nl) mice (n = 4) (B), as well as in postnatal day 14, 21 and 28 kidneys from *Pkd1*^{+/+}:*Pkhd1*-Cre (n = 4) and *Pkd1*^{flox/flox}:*Pkhd1*-Cre mice (n = 4) (C), respectively.

Supplemental Figure 2. (A) qRT-PCR analysis of the expression of c-Myc mRNA in postnatal day 14 and postnatal day 21 kidneys from *Pkd1*^{+/+}:*Pkhd1*-Cre (WT) (n = 4) and *Pkd1*^{flox/flox}:*Pkhd1*-Cre (Flox) (n = 4) neonates. ** $p < 0.01$. (B) Western blot analysis of the expression of c-Myc from whole cell lysates of *Pkd1* null MEK (Null) cells and *Pkd1* mutant PN24 cells treated with STA9090 (200 nM) for 24 hours.

Supplemental Figure 3. (A) The postnatal *Pkd1* mutant PN24 cells were treated with DMSO or 1 μ M JQ1 for 24 hours and the cell cycle profile was analyzed by PI staining. n = 5, * $p < 0.05$, ** $p < 0.01$. (B) The postnatal *Pkd1* heterozygous PH2 cells were treated with DMSO or 1 μ M JQ1 for 24 hours and the cell cycle profile was analyzed by PI staining. n = 3.

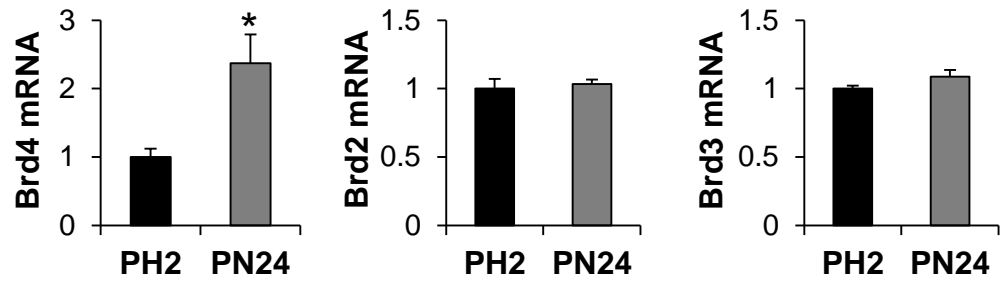
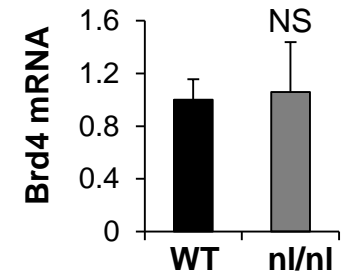
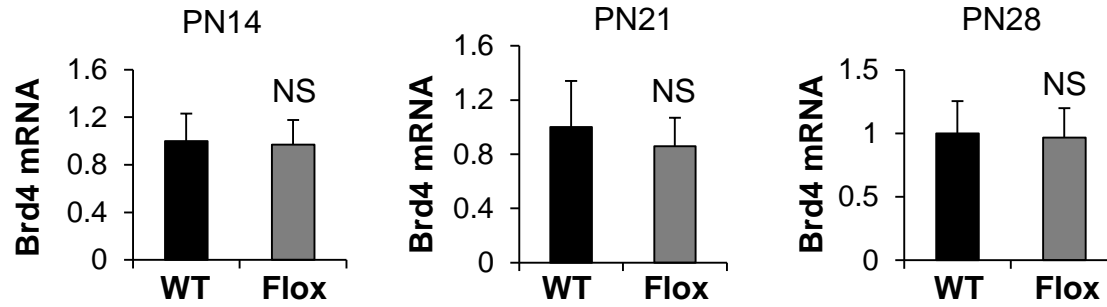
Supplemental Figure 4. Knockdown of Brd4 with shRNA or inhibition of Brd4 with JQ1 increases the expression of p21 and decreases the phosphorylation of Rb. (A) Western blot analysis of the expression of p21, phospho-Rb and Rb in *Pkd1* homozygous PN24 (PN24) cells transduced with lentivirus mediated Brd4 shRNA. (B) Western blot analysis of the expression of p21, phospho-Rb and Rb in postnatal *Pkd1* mutant PN24 cells treated with 1 μ M JQ1 at indicated time points. (C and D) Western blot analysis of the expression of p21, phospho-Rb and Rb in postnatal *Pkd1* mutant PN24 cells (C) and in *Pkd1* null MEK cells (D) treated with JQ1 with indicated concentrations.

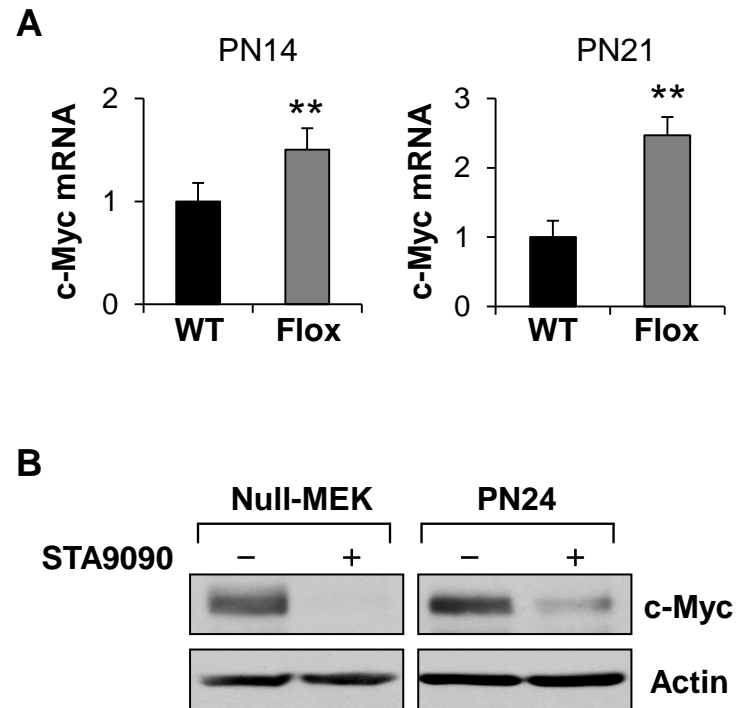
Supplemental Figure 5. *Pkd1* mutant PN24 cells were transfected with pcDNA-c-Myc or empty vector for 24 hours and were followed by treatment with 1 μ M JQ1 for 24 hours. The cell cycle profile was analyzed by FACS analysis with PI staining. n = 3, * $p < 0.05$.

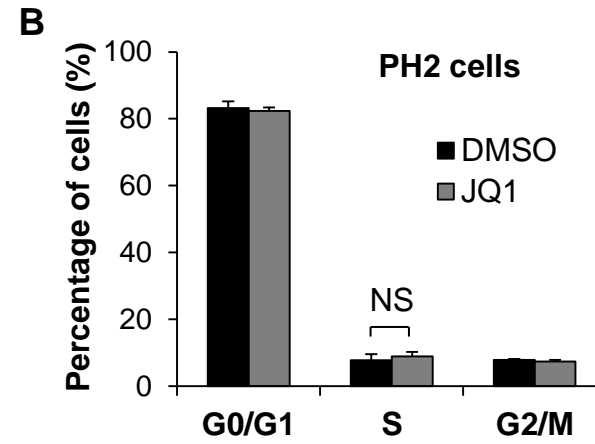
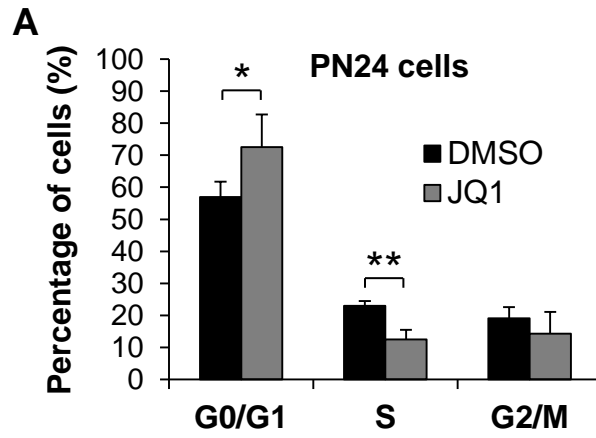
Supplemental Figure 6. The kidney weight and body weight of PN25 *Pkd1^{+/+}:Pkh1-Cre* mice treated with DMSO or JQ1. n = 5.

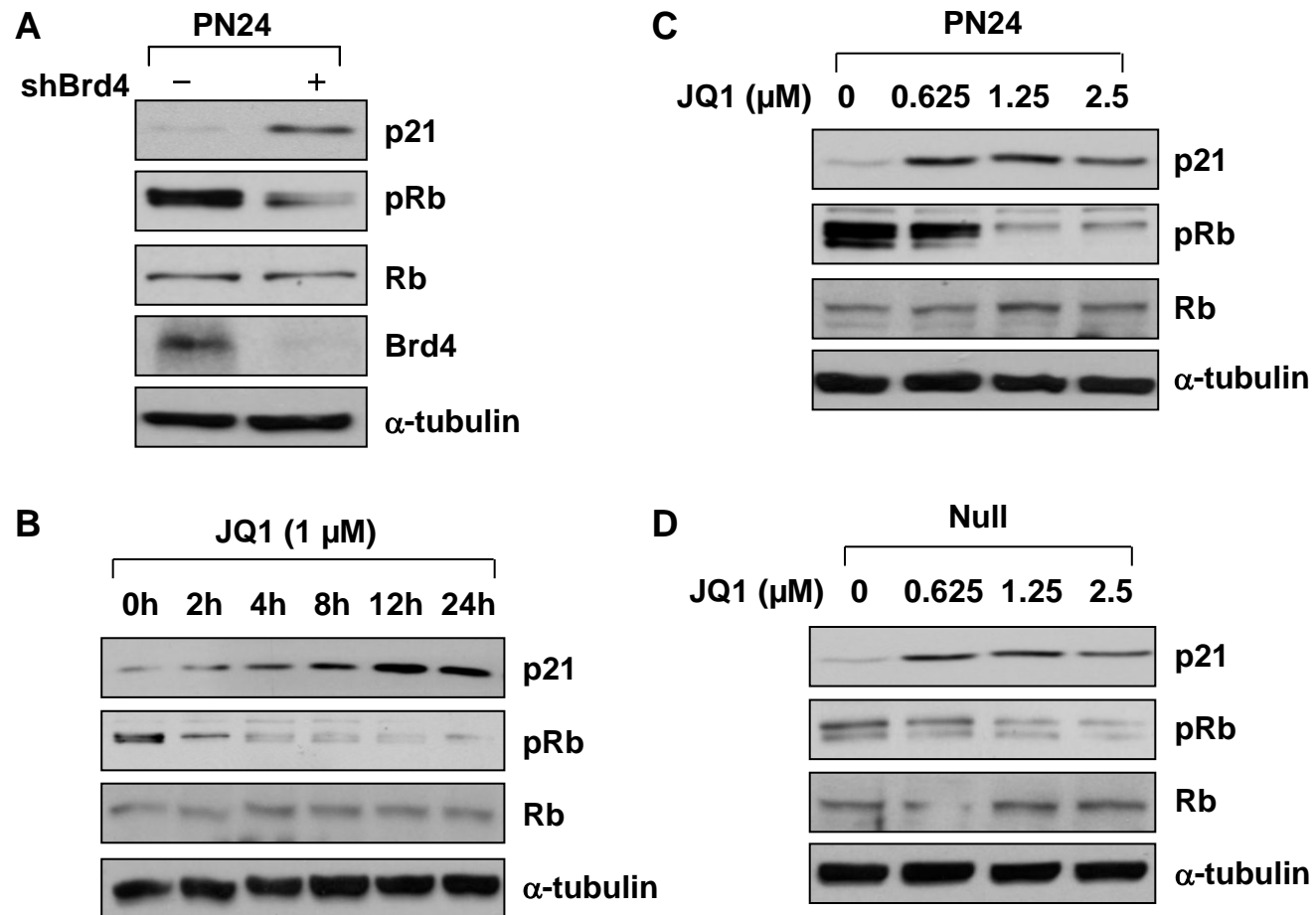
Supplemental Figure 7. (A) qRT-PCR analysis mRNA level of Brd4 in kidneys from *Pkd1^{flox/flox}:Pkh1-Cre* mice treated with JQ1 or DMSO, respectively. n = 3. **(B)** JQ1 treatment reduced cyst-lining epithelial cell proliferation in PN25 kidneys of *Pkd1^{flox/flox}:Pkh1-Cre* neonates as detected by PCNA staining. On average, the percentage of PCNA-positive nuclei in cystic lining epithelial cells was calculated from 1000 nuclei per mouse kidney section and only strongly stained nuclei were considered as PCNA-positive. ** $p < 0.01$. Scale bar, 50 μ m.

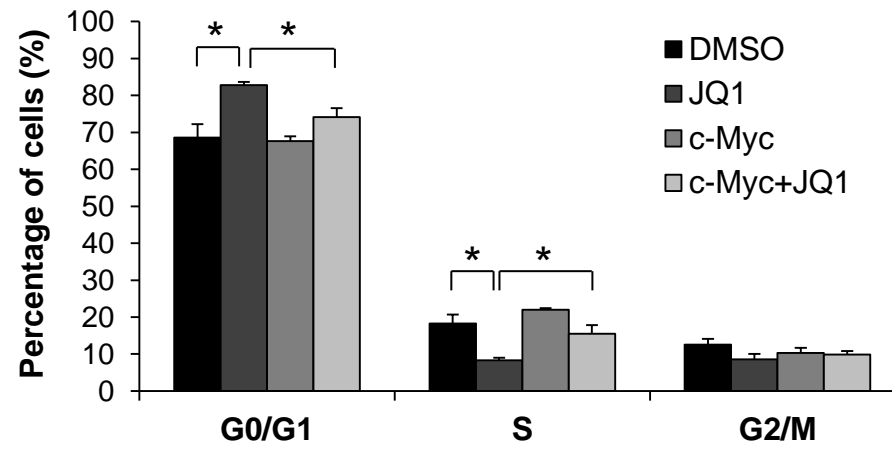
Supplemental Figure 8. (A) The kidney weight and body weight of PN28 *Pkd1^{+/+}* mice treated with DMSO or JQ1. n = 5. **(B)** JQ1 treatment reduced cyst-lining epithelial cell proliferation in PN28 kidneys of *Pkd1^{nl/nl}* neonates as detected by PCNA staining. ** $p < 0.01$. Scale bar, 50 μ m. **(C)** qRT-PCR analysis mRNA level of Brd4 in kidneys from *Pkd1^{nl/nl}* mice treated with JQ1 or DMSO, respectively. n = 4.

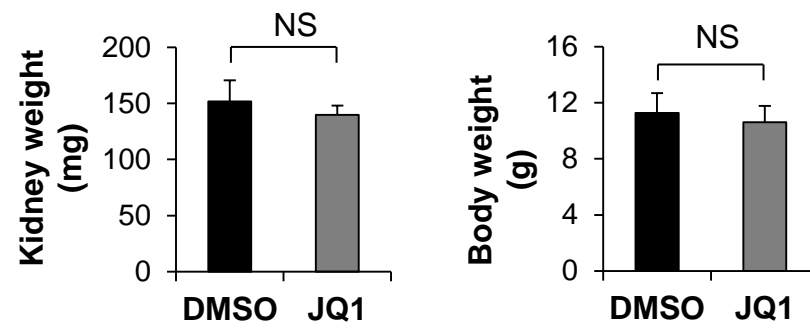
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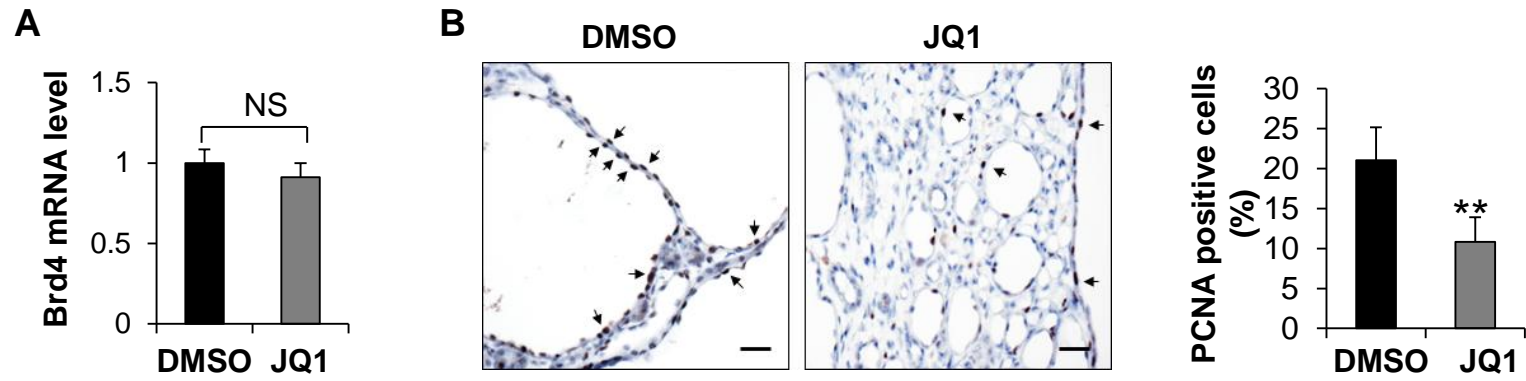


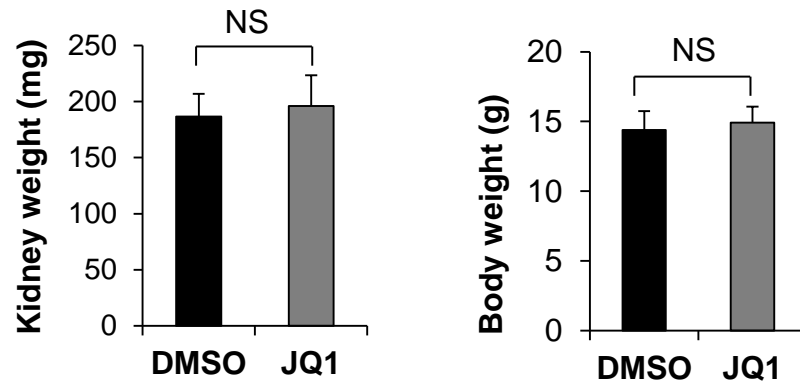
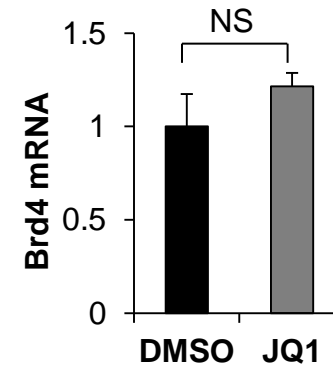










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