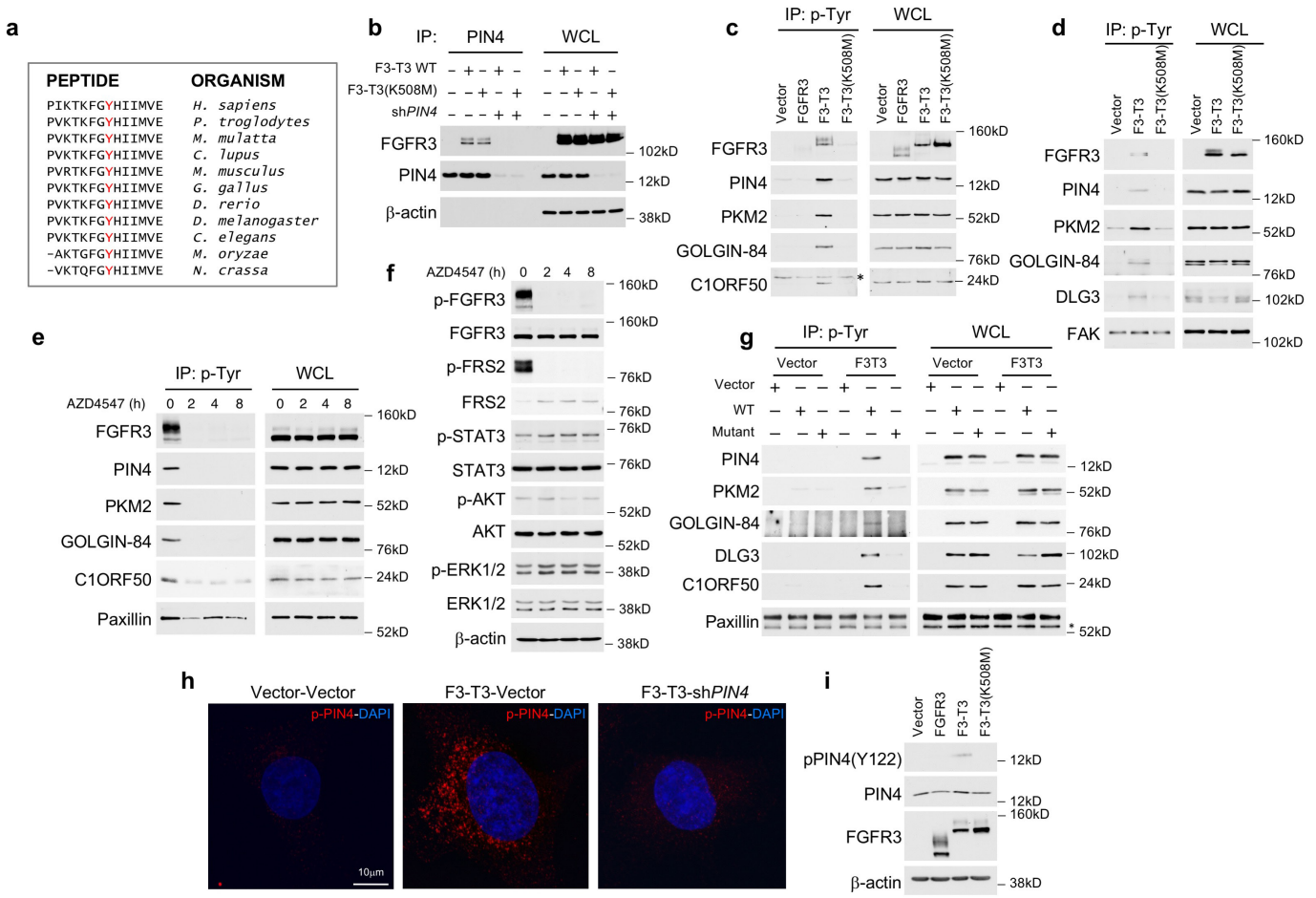

Extended Data Figure 3 | Phosphorylation of Y122 of PIN4 by F3–T3. **a**, Amino acid sequence flanking Y122 of PIN4 (in red) is evolutionarily conserved. **b**, Immunoprecipitation–western blot analysis of human astrocytes expressing F3–T3 or F3–T3(K508M) with or without silencing of endogenous *PIN4*. β-Actin is shown as a loading control. WCL, whole-cell lysate. **c**, Immunoblot analysis of phosphotyrosine immunoprecipitates (left) or whole-cell lysates (right from U87 glioma cells expressing empty vector, FGFR3, F3–T3 or F3–T3(K508M) using the indicated antibodies. The asterisk indicates a non-specific band. **d**, Immunoblot analysis of phosphotyrosine immunoprecipitates (left) or whole-cell lysates (right) from human astrocytes expressing empty vector, F3–T3 or F3–T3(K508M) using the indicated antibodies. FAK is shown as a loading control. **e**, Immunoblot analysis of phosphotyrosine immunoprecipitates (left) or whole-cell lysates (right) from GSC1123 cells expressing endogenous F3–T3 shows decreased phosphorylation of F3–T3 substrates following treatment with AZD4547 for the indicated times. Paxillin is shown as a loading control. **f**, Immunoblot analysis of canonical FGFR signalling proteins in GSC1123 cells treated with AZD4547 for the indicated time. β-Actin is shown as a loading control. **g**, Immunoblot analysis of phosphotyrosine immunoprecipitates from human astrocytes expressing F3–T3 or vector transduced with wild-type or the unphosphorylable Y to A F3–T3 kinase substrate mutants. Paxillin is shown as a loading control. The asterisk indicates a non-specific band. **h**, Confocal images of immunofluorescence staining using the phospho-PIN4(Y122)-specific antibody (red) in human astrocytes transduced with vector or F3–T3 without or with silencing of endogenous *PIN4*. Nuclei were stained with DAPI (blue). **i**, Immunoblot analysis of phospho-PIN4(Y122), total PIN4 and FGFR3 in SF126 cells transduced with FGFR3, F3–T3, F3–T3(K508M) or the empty vector. β-Actin is shown as a loading control. Molecular weights are indicated in all panels. Experiments in **b**–**g**, **i** were repeated independently three times with similar results. Experiment in **h** was repeated independently four times with similar results.