Supplementary Figure Legends

Supplementary Figure 1. Insulin stimulated AKT phosphorylation in dermal fibroblasts Dermal fibroblasts in exponential phase were serum starved overnight followed by insulin treatment (100 nM) and then harvested at the indicated times. Insulin stimulated AKT phosphorylation was revealed by Western blotting using anti-phospho-AKT(Thr308) antibody and total ATK was revealed using anti-AKT antibody. Loading was revealed by Coomassie staining.

Supplementary Figure 2. Examples of centrosome amplification observed during (A) interphase and (B) mitotic phase Centrosomes (red) were revealed using anti-ALMS1 antibodies and spindle fibres (green) were revealed using anti-acetylated tubulin antibodies together with appropriate Alexa Fluor conjugated secondary antibodies. Nuclei (blue) were revealed with DAPI. Representative images in (A) show that centrosome amplification can range from 3 to 9 with varying degrees of scattering and clustering. Images in (B) were captured at metaphase showing varying numbers of multipolar formations. Centrosome clustering ensured normal or near normal anaphase to form which led to eventual bipolar cell division (see figures in the main text).

Supplementary Figure 3. Mitotic indices of proband and control dermal fibroblasts. Asynchronous proliferating cells were BrdU pulse labelled for 7 hours and then fixed and stained with fluorescein-conjugated anti-BrdU antibody. Nuclei were stained with DAPI. (A) Representative images of stained cells (B) Quantification derived from scoring over 300 cells.

Supplementary Figure 4. Appearance of primary cilia in serum starved primary dermal fibroblasts from proband. Cells that were serum starved for 24 hours were fixed and stained with anti-ALMS1 antibody to reveal the basal bodies (red) and anti-acetylated tubulin to reveal cilia (green). Nuclei (blue) were stained with DAPI.

Supplementary Figure 5. (A) DNA content analysis of asynchronously growing, non confluent proband dermal fibroblasts and (B) Karyotype of proband dermal fibroblasts DNA contents were analysed using flow cytometry following propidium iodide staining in lysis hypotonic buffer containing RNase A. Analysis of karyotype was performed following metaphase spread with the resulting chromosomes being stained with Leishman's stain, using CytoVision^{TM} software (CytoVision Genus Version 4.5.4, Genetix).

Supplementary Figure 6. γH2AX expression in proband and healthy control dermal fibroblasts Protein lysates from asynchronously proliferating, non-confluent proband and healthy control dermal fibroblasts were resolved on a 4 -12% pre-cast polyacrylamide gel, transferred to polyvinylidene-fluoride membrane and detected using anti-γH2AX primary antibodies and horseradish peroxidase

conjugated secondary antibodies in conjunction with chemiluminescent HRP substrates. Loading was revealed by Coomassie staining.