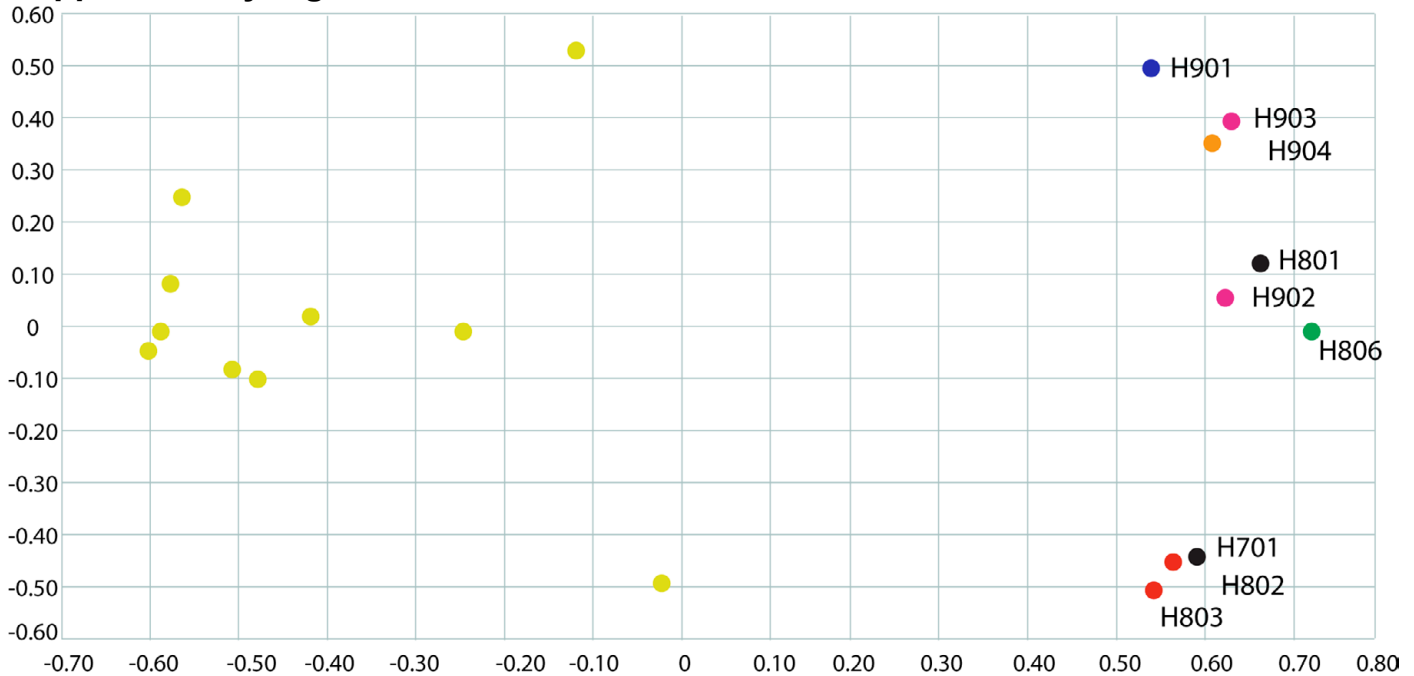


Supplementary Figure 1



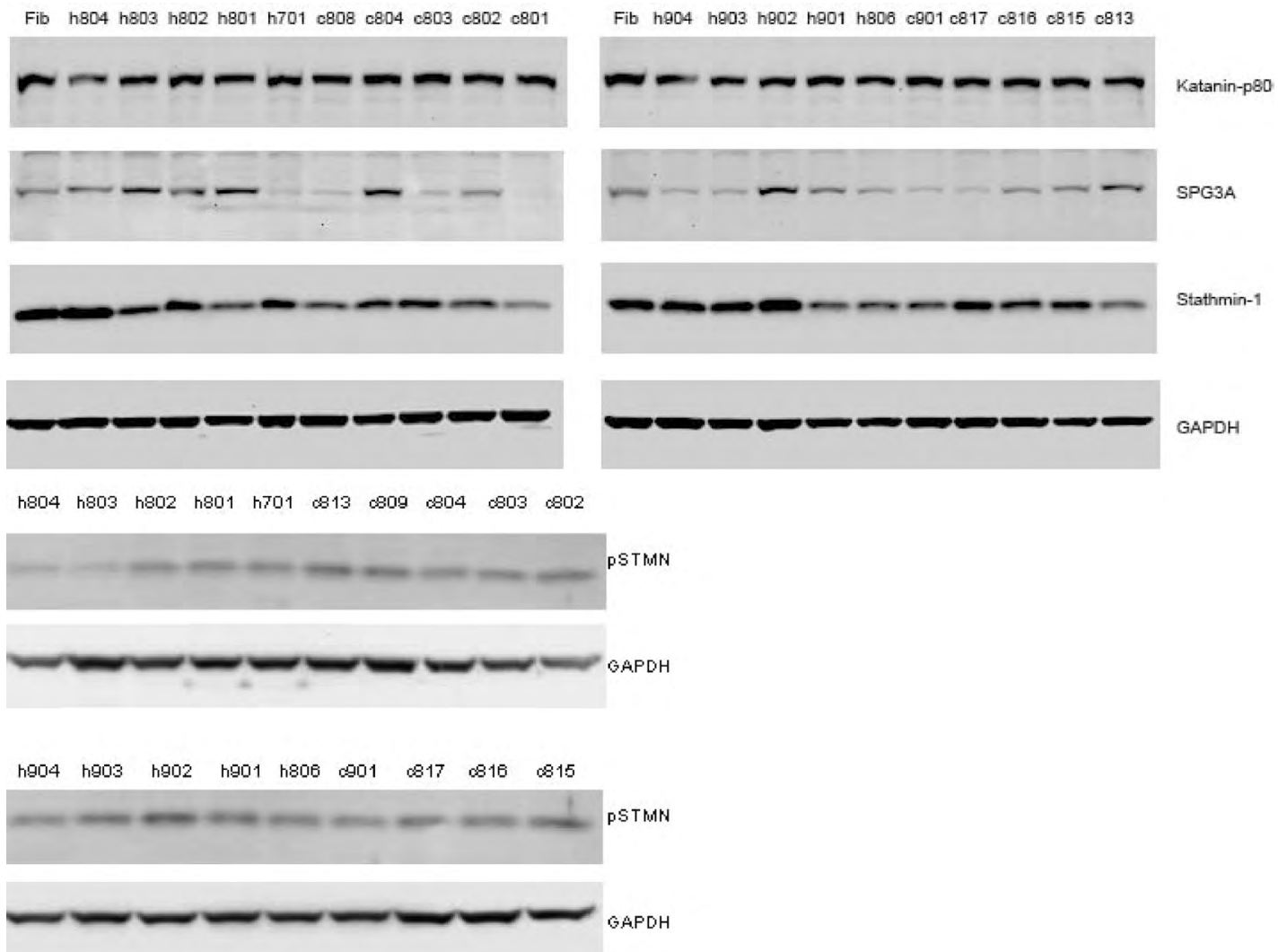
- Exon 2
- Exon 3
- Exon 7
- Exon 8/9
- Exon 11
- Exon 17
- Controls

Short ID	Exon/Intron	Nucleotide change†
H701	11	c.1413+3_1413+6del
H801	11	c.1392 A>T
H802	3	c.583C>G
H803	3	c.583C>G
H806	7	c.1096G>A
H901	2	c.444G>A
H902	17	c.1789A>G
H903	17	c.1789A>G
H904	8-9	SPG4Ex del 8-9

Principal Component Analysis demonstrates Group and Individual Differences

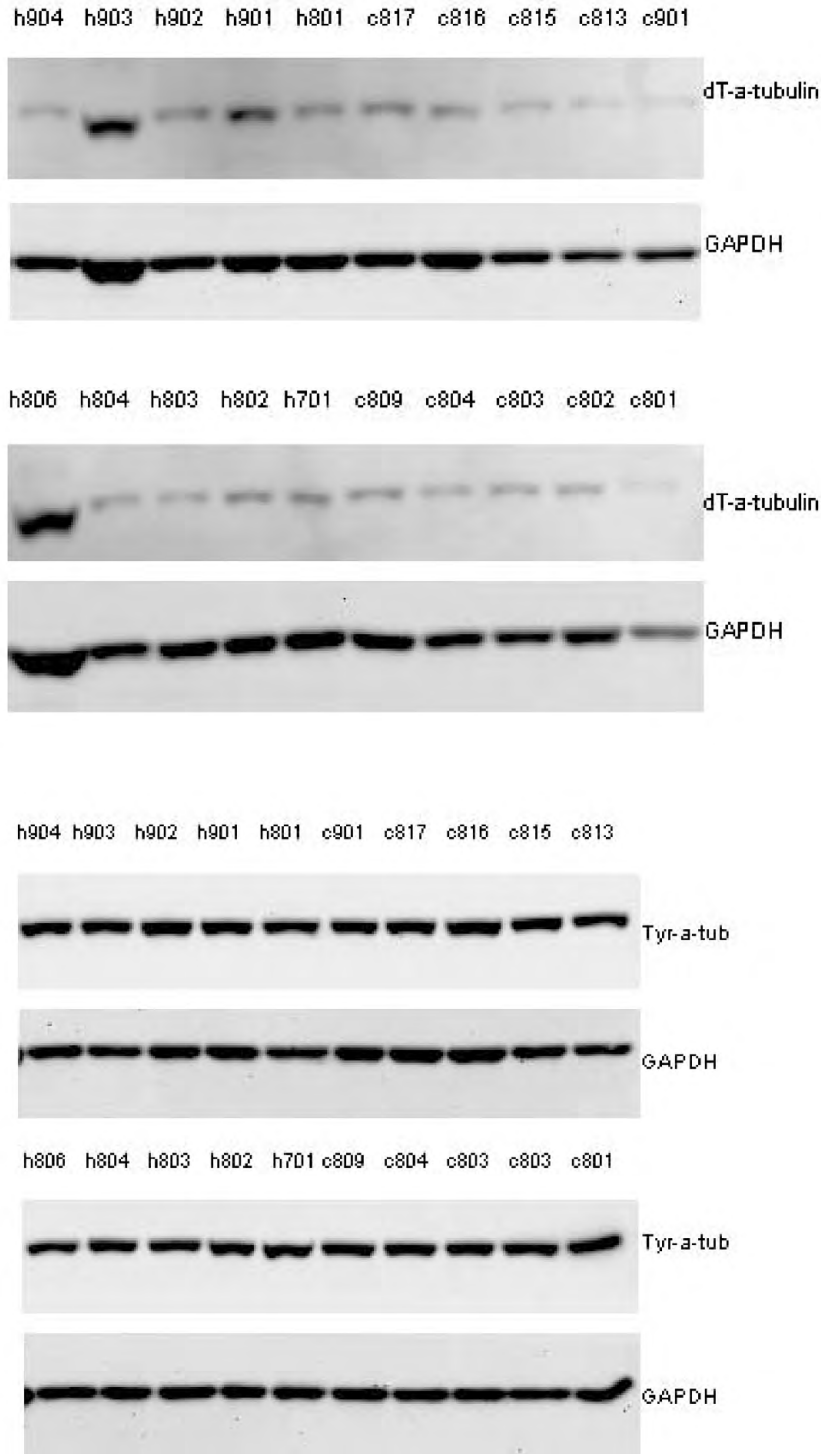
The x-axis shows that the primary component, which accounts for 34% of the variance in the gene expression data, separates the cells into two groups, Patients to the right and Controls to the left. The y-axis shows that Patients and Controls are distributed over the same range of the secondary component, which accounts for 19% of the variance in the data. The type of mutation in each of the Patients is indicated by the colour of the dot and the Table. The secondary component did not reliably separate the Patients according to specific mutations.

Supplementary Figure 2



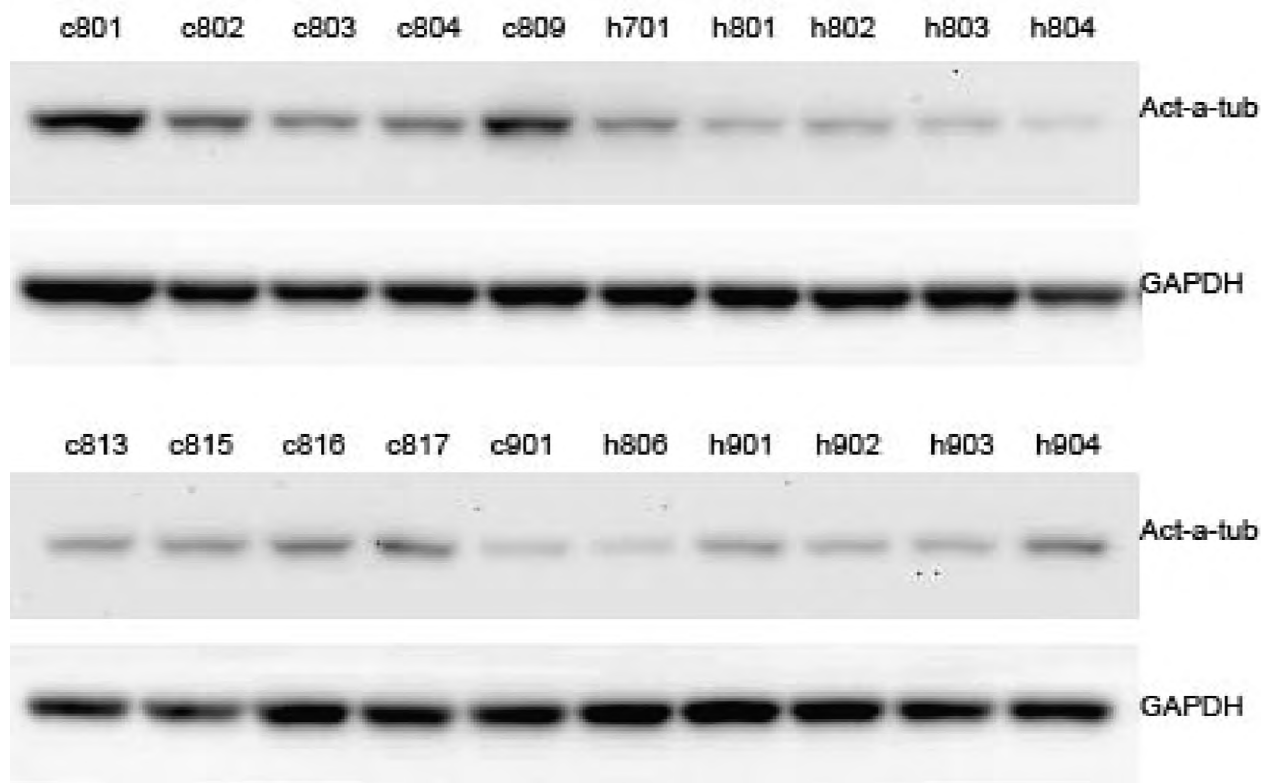
Immunoblots showing expression of proteins indicated in 10 Patients (Columns labelled “h”) and 10 Controls (Columns labelled “c”) (HSP: 5 left columns) and 10 Control. Columns labelled “Fib” are positive controls using protein from fibroblasts. Columns labelled “h804” are from a patient without an identified SPAST mutation. These were not included in any analyses. These data are summarised in Figure 3.

Supplementary Figure 3

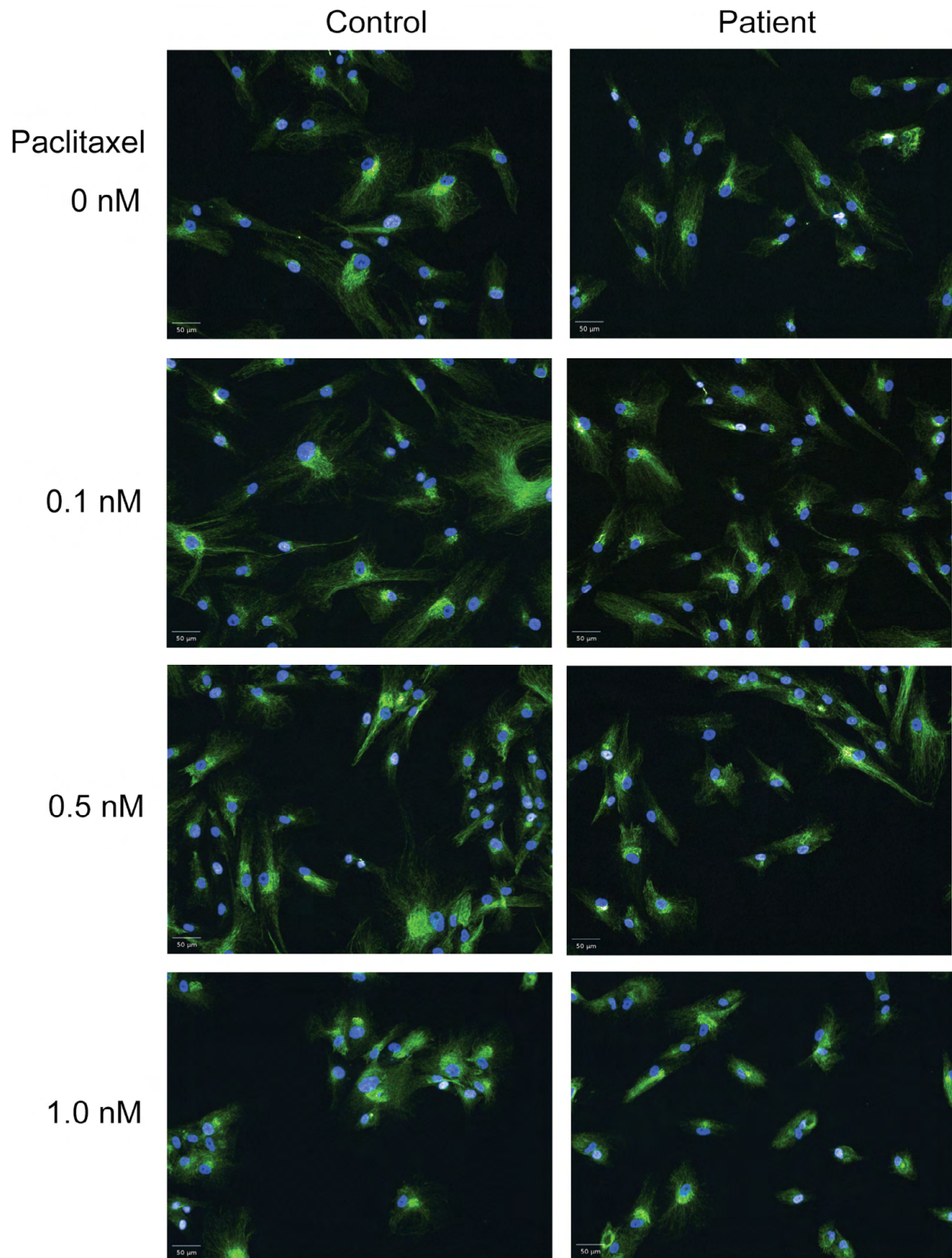


Immunoblots showing expression of de-tyrosinated α -tubulin (dT-a-tubulin) and tyrosinated α -tubulin (Tyr-a-tub) and GAPDH loading controls in 10 Patients (Columns labelled “h”) and 10 Controls (Columns labelled “c”) (HSP: 5 left columns) and 10 Control. Columns labelled “h804” are from a patient without an identified SPAST mutation. These were not included in any analyses. These data are summarised in Figure 3.

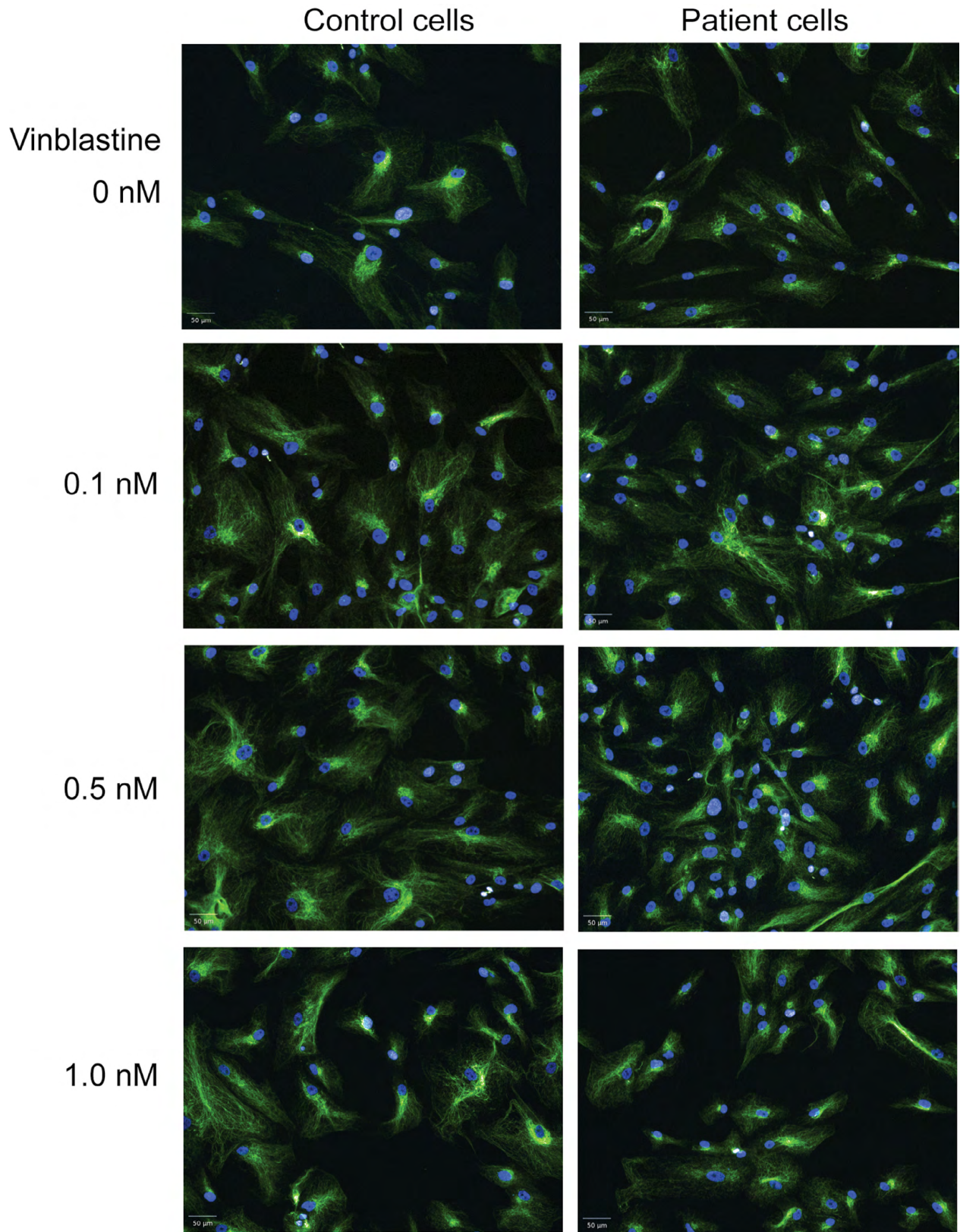
Supplementary Figure 4



Immunoblots showing expression of acetylated α -tubulin (Act-a-tub) and GAPDH loading controls in 10 Patients (Columns labelled “h”) and 10 Controls (Columns labelled “c”) (HSP: 5 right columns) and 10 Control. The column labelled “h804” is from a patient without an identified SPAST mutation and was not included in any analyses. These data are summarised in Figure 3.



Examples of images used in the automated image analysis showing acetylated α -tubulin immunofluorescence (green) and labelled nuclei (blue) in a Control and a Patient cell line at the indicated doses of paclitaxel.



Examples of images used in the automated image analysis showing acetylated α -tubulin immunofluorescence (green) and labelled nuclei (blue) in a Control and a Patient cell line at the indicated doses of vinblastine.

Supplementary Table 4**GenBank
accession**

number	Gene	Forward primer	Reverse primer	Annealing Temp (°C)	Product size (bp)
NM_181598	SPG3A	TTTACAGTGCAGCAGCAACC	TGATTGTTCAGTAGATTCCGACTT	59	80
NM_005563	STMN1	GGTCACGTGCCTCTGTTTG	GCCTGACCACACTCTGAGC	59	68
NM_007044	KATNA1	GCGGACATTACCAACGTGT	CATGTGCATTTCTTCTTTGGAA	59	111
NM_001014380	KATNAL1	CAAACCTGGAAAAACATCACA	ATGTTAACTGGGGGCCACTC	59	96
NM_005886	KATNB1	GGAGGAGGTGATGCTGGTC	GAAGCAACAGTTGGGCAAAG	59	99
NM_031303	KATNAL2	CAGACTGGCAAAGAGAGTTCCG	TCTTTGTGGTTGCCTTTGTG	59	75