Supplementary Material

Supplementary Methods

Visual Machine System

The two image processing platforms selected for the analysis were National Instruments (NI): Vision Builder for Automated Inspection (VBAI) and MATLAB: Image Processing Toolbox. VBAI is an icon-based image analysis program that allows for quick algorithm development and easy implementation, while MATLAB (Matrix Laboratory) is a coding based language that is used for more adaptable image processing (NI 2005, Andres 2006). For the paw measurements, MATLAB and its Image Processing Toolbox were used as a secondary image analysis tool, to verify the measurements made by the primary VBAI inspection algorithm.

The camera used in the analysis was a Basler A622-f, with an IEEE 1394A 'Firewire' connection, a manual focus lens and a CMOS (complementary metal oxide semiconductor) image sensor. The camera was fixed 24" above the inspection environment, oriented normal to the table surface.

The system was initially calibrated in VBAI using a grid of dots, with 0.225" from center to center, to assign a dimensional relationship with the image's pixels and to adjust for the lens' fish-eye effect (NI 2005, Shah 1996). Image processing steps were required, due to print inconsistencies, to determine the approximate x-y image coordinates of the centroid of each paw print, which would be used to calculate the stride distances. The 8-bit paw image was imported into VBAI, via the CMOS sensor and the Firewire cable, and processed using the non-linear morphological functions available in the NI Vision Assistant (NI 2005, Davies 2005). A user-defined region of interest was first created around the prints in VBAI, excluding any outside pixel information. The image of the paw prints was then eroded, in 3 iterations, using a full, 7x7 structuring element, to increase the size and consistency of each print. Next, the grayscale image was verged into a binary image, converted to black (0) and

white (1), based upon a user defined intensity value between 0 and 255, to extract the paw information from any spurious background information (smudges, pencil marks, and similar noise). Once the image was converted to a binary file, it was dilated, in 2 iterations, using a full, 5x5 structuring element. The image was dilated to decrease the overall area of each print, which increased the accuracy in mapping each paw's centroid location. Next, the image was analyzed to detect distinct objects, based upon abrupt changes in pixel intensity values and connectivity between adjacent pixels. Finally, the distance measurements were calculated in VBAI based upon the x-y centroid locations and the data were logged. A paper discussing the theory and application is in preparation.

Supplementary Figure Captions

Supplementary Fig 1 Cranial Nerve VII. Lateral hemisphere of cerebellum located inferior to cranial nerve VII. An enlargement of a cerebellar lateral hemisphere results in direct pressure on nerves.

Supplementary Fig 2 Male Weights. (**a**) Male weights were plotted over time from P23 to P42. No significant difference was found using an ANOVA with random mouse effect analysis. (**b**) A power analysis indicated that the sample number was too low to detect significant differences in weight, if any. A two-way ANOVA was also performed and found no significant differences in weight gain over time.

Supplementary Fig 3 Female Weights. (**a**) Female weights were plotted over time from P23 to P42. No significant difference was found using an ANOVA with random mouse effect analysis. (**b**) A power analysis indicated that the sample number was too low to detect significant differences in weight, if any. A two-way ANOVA was also performed and found no significant differences in weight gain over time

Supplementary Fig 4 Statistical power analysis for one-way ANOVA on mean weights of male and female mice for P23, P28, P30, P35, P37, and P42.

Supplementary Table 1 List of all mice and mice genders used for various behavioral assays. For grouping purpose, the mice were separated into medulloblastoma-prone vehicle (MB-DMSO), medulloblastoma-prone treated with bortezomib (MB-VLCD), wild type vehicle (WT-DMSO) and wild type treated with bortezomib (WT-VLCD).

WT-DMSO		WT-VLCD		MB-VLCD		MB-DMSO	
Males	Females	Males	Females	Males	Females	Males	Females
46336	46362	46328	46326	46327	46357	46339	46333
46338	46914	46334	46363	46330	44454	44467	46337
46359	36939	44474		46361	44455	44468	46364
44457				44458		46539	44456
44475				44476			44464
46537							36935
46538							36938
P23				P28			
WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO	WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO
46336	46326	46327	46333	46336	46326	46327	46333
46338	46328	46330	46337	46338	46328	46330	46337
46359	46334	46357	46339	46359	46334	46357	46339
46362	46363	46361	46364	46362	46363	46361	46364
				46357			46539
				46358			
P30				P35			
WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO	WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO
46336	46326	46327	46333	46336	46326	46327	46333
46359	46328	46330	46337	46338	46328	46330	46337

46338	46334	46357	46339	46359	46334	46357	46339
46362	46363	46361	46364	46362	46363	46361	46364
46537			46539	46914			46935
46538				46939			46938
P37				P42			
WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO	WT-DMSO	WT-VLCD	MB-VLCD	MB-DMSO
46336	46326	46357	46339	46336	46326	46357	46339
46338	46328	46361	46364	46338	46328	46361	46364
46359	46334	44454	44456	46359	46334	44454	44456
46362	46363	44455	44464	46362	46363	44455	44464
44457	44474	44458	44467	44457	44474	44458	44467
44475		44476	44468	44475		44476	44468
46537			36935	46914			36935
46358			36938	36939			36938
46914							
36939							

Supplementary Table 2 The table below shows the stride length analysis results. A Student Newman-Keuls test was performed for each day in order to identify the group that differed.

P37, p = 0.003			
Groups	Mean Difference	q	p ≤ 0.05
MB-DMSO vs WT-VLCD	-11.95	5.414	Yes
MB-DMSO vs WT-DMSO	-7.156	3.669	Yes
MB-DMSO vs MB-VLCD	-5.181	2.492	No
MB-VLCD vs WT-VLCD	-6.774	3.129	No
MB-VLCD vs WT-DMSO	-1.975	---	No
WT-DMSO vs WT-VLCD	-4.799	---	No
P42, p = 0.002			
Groups	Mean Difference	q	p ≤ 0.05
MB-DMSO vs WT-VLCD	-18.28	4.6	p ≤ 0.01
MB-DMSO vs WT-DMSO	-14.55	4.085	p ≤ 0.01
MB-DMSO vs MB-VLCD	-12.74	2.433	No*
MB-VLCD vs WT-VLCD	-5.547	2.395	No
MB-VLCD vs WT-DMSO	-1.809	---	No
WT-DMSO vs WT-VLCD	-3.738	---	No

Supplementary References

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