

p53 Hotspot Mutation Cell Panels

p53 is a tumor suppressor protein encoded by the TP53 gene in humans. It controls the cellular response to DNA damage through the induction of cell-cycle arrest, apoptosis, and cellular senescence, and by regulating key stages of metabolism, tumor metastasis and invasion. As a result, p53 has been described as "the guardian of the genome".¹ About half of human tumors contain mutations or deletions of p53,² the remainder have mutations in genes that partially block the p53 pathway. Approximately, 95% of p53 mutations lie in the core DNA-binding domain and 40% of these mutations occur in one of six "hotspots;" all of which are known to severely restrict p53 function.² ATCC p53 mutation cell line panels are composed of the most commonly used human cancer cell lines from breast, lung, colon, pancreatic, hematopoietic, and lymphoid tissues. Moreover, they cover p53 hotpost mutations at codon 175, 245, 248, 273, and 282. These panels are useful tools for the study of p53 function, wild-type p53 function reactivation, cancer biology, and anti-cancer drug discovery.

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For over 95 years, ATCC has been a leading provider of high-quality biological materials and standards to the life science community. We are an independent, 501(c)(3) non-profit entity focused on scientific enablement at universities, research institutes, government agencies, and commercial research labs. Our diverse and comprehensive resources in cell biology and microbiology have been central to the growth of the biotechnology age. ATCC has as its core mission to source, authenticate and further develop products and services essential to the needs of basic and applied life science work.

ATCC distributes to more than 165 countries on 6 continents and has a growing international network of 15 distribution partners. Our infrastructure and experience in biological materials logistics enables us to work effectively with researchers no matter where they are located.

BREAST CANCER p53 HOTSPOT MUTATION CELL PANEL

The Breast Cancer p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2010</u>^m) is composed of eight select cell lines derived from breast cancer. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 175, 248, 249, or 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

ATCC [®] No.	Name	Histology	Tumor Source	TP53 status	Zygosity	Gene Mutation ⁺	Protein Sequence⁺
<u>HTB-25</u> ™	MDA-MB-175-VII	ductal carcinoma	metastasis (pleural effusion)	WT			
<u>HTB-27</u> ™	MDA-MB-361	adenocarcinoma	metastasis (brain)	WT			
<u>CRL-2351</u> ™	AU565	adenocarcinoma	metastasis (pleural effusion)	MUT	homozygous	c.524G>A	p.R175H
<u>HTB-30</u> ™	SK-BR-3	adenocarcinoma	metastasis (pleural effusion)	MUT	homozygous	c.524G>A	p.R175H
<u>CRL-2315</u> ™	HCC70	ductal carcinoma	primary	MUT	homozygous	c.743G>A	p.R248Q
<u>HTB-122</u> ™	BT-549	ductal carcinoma	primary	MUT	homozygous	c.747G>C	p.R249S
<u>CRL-2314</u> ™	HCC38	ductal carcinoma	primary	MUT	homozygous	c.818G>T	p.R273L
<u>HTB-132</u> ™	MDA-MB-468	adenocarcinoma	metastasis (pleural effusion)	MUT	homozygous	c.818G>A	p.R273H

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.

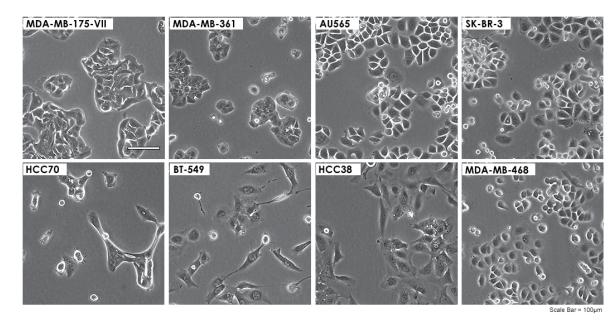


Figure 1: Cell morphology of eight cell lines in the Breast Cancer p53 Hotspot Mutation Cell Panel. Two p53 wild-type breast cancer cell lines, MDA-MB-175-VII and MDA-MB-361, and six p53 hotspot mutation breast cancer cell lines, AU565, SK-BR-3, HCC70, BT-549, HCC38, and MDA-MB-468, were maintained in ATCC recommended culture conditions. Each cell line was grown using ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.

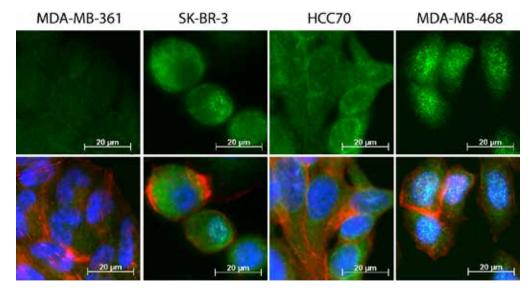
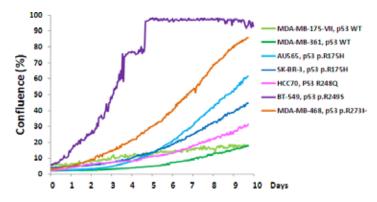
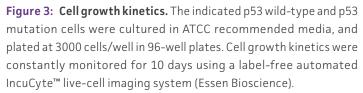


Figure 2: Immunofluorescence staining of p53. The indicated p53 wild-type and p53 mutation cells were grow on collagen-coated coverslips. Cells were fixed with 4% paraformaldehyde. p53 was stained with p53 primary antibody and Alexa Fluor 488 secondary antibody (green). F-actin was visualized with phalloidin Alexa Fluor 594 (red). Nuclei of the cells were visualized with Hoechst 33342 (blue). Single florescence channel images of p53 staining are shown in the upper row, and multichannel merged images are shown in the bottom row.





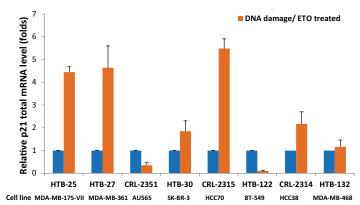


Figure 4: Real time PCR analysis of total mRNA levels of p21, a downstream target of p53, in the indicated p53 wild-type and p53 mutation cell lines. Cells were treated with 20μ M etoposide (ETO) for 6 hours to induce DNA damage, or treated with DMSO as a control. Total mRNA levels of p21 and the housekeeping gene 36B4 were determined by real time quantitative PCR. Relative p21 total mRNA changes were normalized to 36B4.

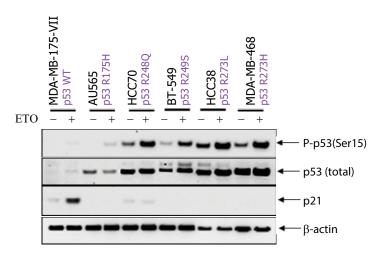


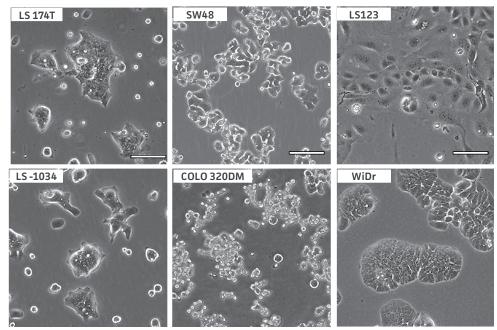
Figure 5: The indicated p53 wild-type and p53 mutation cells were treated with 20 μ M etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting assay was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin protein was also examined as a control.

COLON CANCER p53 HOTSPOT MUTATION CELL PANEL

The Colon Cancer p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2020</u>[™]) is composed of six select cell lines derived from colon cancer. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 175, 245, 248, or 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for novel anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

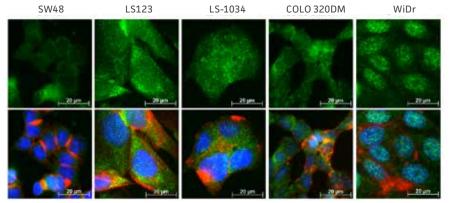
ATCC [®] No.	Name	Tissue	Histology	Tumor Source	TP53 status	Zygosity	Gene Mutation [†]	Protein Sequence [†]
<u>CL-188</u> ™	LS174T	colon	adenocarcinoma	primary	WT	-	-	-
<u>CCL-231</u> ™	SW48	colon	adenocarcinoma	primary	WT	-	-	-
<u>CCL-255</u> ™	LS123	colon	adenocarcinoma	primary	MUT	homozygous	c.524G>A	p.R175H
<u>CRL-2158</u> ™	LS1034	colon	adenocarcinoma	primary	MUT	homozygous	c.733G>A	p.G245S
<u>CCL-220</u> ™	COLO 320DM	colon	adenocarcinoma	primary	MUT	homozygous	c.742C>T	p.R248W
<u>CCL-218</u> ™	WiDr	colon	adenocarcinoma	primary	MUT	homozygous	c.818G>A	p.R273H

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



Scale Bar = $100 \mu m$

Figure 6: Cell morphology of the six cell lines in the Colon Cancer p53 Hotspot Mutation Cell Panel. Two p53 wild-type colon cancer cell lines, LS174T and SW48, and four p53 hotspot mutation colon cancer cell lines, LS123, LS1034, COLO 320DM, and WiDr, were maintained in ATCC recommended culture conditions. Each cell line was grown using ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.



IF staining: p53; F-actin; nuclei

Figure 7: Cellular localization of p53. The indicated p53 wild-type and p53 mutation cells were grow on collagen-coated coverslips. Cells were fixed with 4% paraformaldehyde. p53 was stained with p53 primary antibody and Alexa Fluor 488 secondary antibody (green). F-actin was visualized with phalloidin Alexa Fluor 594 (red). Nuclei of the cells were visualized with Hoechst 33342 (blue). Single florescence channel images of p53 staining are shown in the upper row, and multichannel merged images are shown in the bottom row.

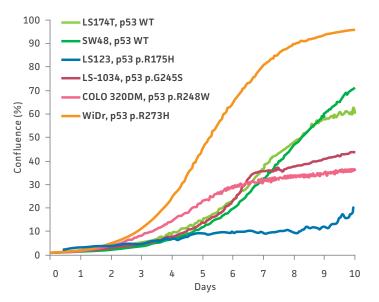


Figure 8: Cell growth kinetics. The indicated p53 wild-type and p53 mutation cells were cultured in ATCC recommended media, and plated at 3000 cells/well in 96-well plate. The cell growth kinetics were constantly monitored for 10 days using a label-free automated IncuCyte[®] live-cell imaging system (Essen Bioscience).

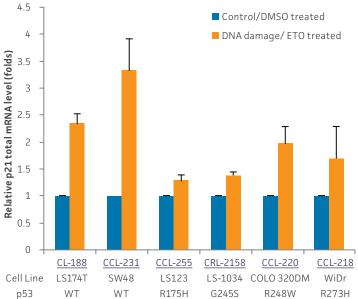


Figure 9: p53-target gene expression changes in response to DNA damage. The indicated cell lines were treated with 20 μ M etoposide (ETO) for 6 hours to induce DNA damage, or treated with DMSO as a control. Total mRNA level of p21 and 36B4 were determined by real time quantitative PCR. Relative p21 total mRNA changes were normalized to the housekeeping gene 36B4.

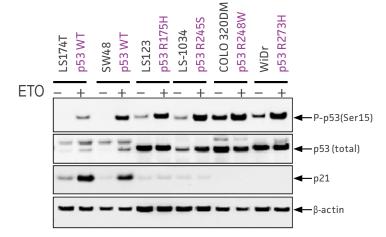


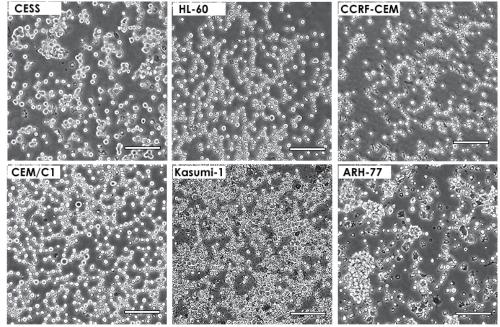
Figure 10: p53 phosphorylation in response to DNA damage. The indicated p53 wild-type and p53 mutation cells were treated with 20 μ M etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting assay was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin protein was also examined as a control.

LEUKEMIA p53 HOTSPOT MUTATION CELL PANEL

The Leukemia p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2070</u>^m) is composed of six select suspension cell lines derived from individuals with leukemia. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 175, 248, and 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

ATCC [®] No.	Name	Tissue	Histology	TP53 status	Zvgosity	Gene mutation [†]	Protein Sequence [†]
			57	1	_, 500.09		
<u>TIB-190</u> ™	CESS	blood	acute myeloid leukemia (AML)	WT	-	-	-
<u>CCL-240</u> ™	HL-60	blood	acute promyelocytic leukemia (APL)	NULL	homozygous	c.(del)	-
<u>CCL-119</u> ™	CCRF-CEM	blood	acute lymphoblastic leukemia (ALL)	MUT	heterozygous	c.524G>A; c.743G>A	p.R175H; p.R248Q
<u>CRL-2265</u> ™	CEM/C1	blood	acute lymphoblastic leukemia (ALL)	MUT	heterozygous	c.524G>A	p.R175H
<u>CRL-2724</u> ™	KASUMI-1	blood	acute myeloid leukemia (AML)	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-1621</u> ™	ARH-77	blood	plasma cell leukemia, carry EBV	MUT	homozygous	c.818G>A	p.R273H

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



Scale Bar = 100µm

Figure 11: Cell morphology of the six cell lines in the Leukemia p53 Hotspot Mutation Cell Panel. Each cell line was grown using the ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.

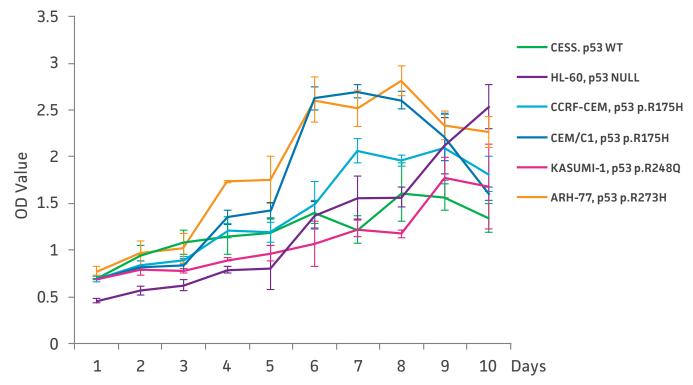


Figure 12: Cell growth kinetics. The indicated p53 wild-type and p53 mutation cells were cultured in ATCC recommended media, and plated at 3000 cells/well in 96-well plates. The cell growth kinetics were monitored for 10 days by CellTiter 96[®] AQueous One Solution Cell Proliferation Assay (Promega).

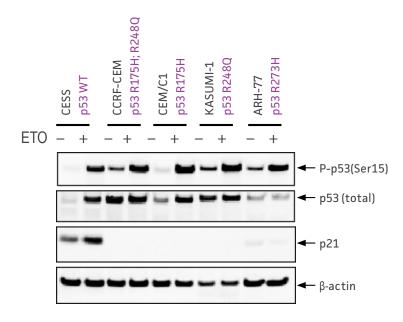


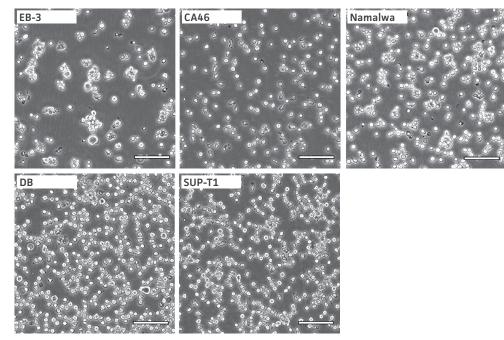
Figure 13: The indicated p53 wild-type and p53 mutation cells were treated with 20 μ M etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin protein was also examined as a control.

LYMPHOMA p53 HOTSPOT MUTATION CELL PANEL

The Lymphoma p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2050</u>[™]) is composed of five select suspension cell lines derived from lymphomas. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 248, and 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

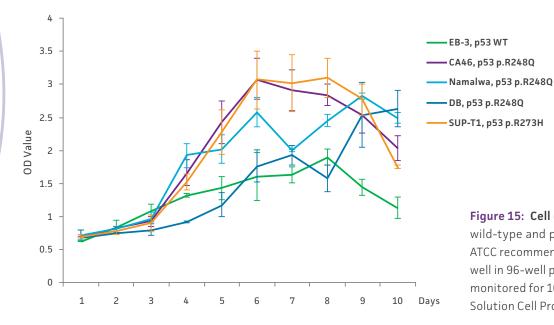
ATCC [®] No.	Name	Tissue	Histology	TP53 status	Zygosity	Gene mutation [†]	Protein Sequence [†]
<u>CCL-85</u> ™	EB-3	lymph node	Burkitt lymphoma	WT	-	-	-
<u>CRL-1648</u> ™	CA46	lymph node	Burkitt lymphoma	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-1432</u> ™	Namalwa	lymph node	Burkitt lymphoma, carry EBV	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-2289</u> ™	DB	lymph node	large B-cell lymphoma	MUT	heterozygous	c.743G>A	p.R248Q
<u>CRL-1942</u> ™	SUP-T1	lymph node	T cell lymphoblastic lymphoma	MUT	heterozygous	c.818G>A	p.R273H

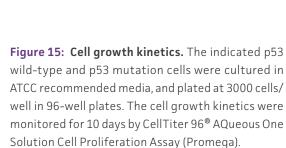
[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



Scale Bar = 100µm

Figure 14: Cell morphology of five cell lines in the Lymphoma p53 Hotspot Mutation Cell Panel. Each cell line was grown using the ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.





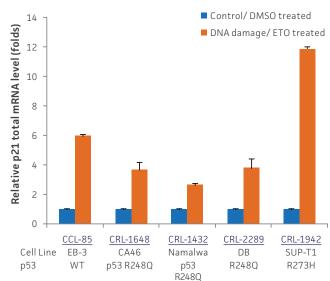


Figure 16: Real-time PCR analysis of total mRNA levels of p21, a downstream target of p53, in the indicated p53 wild-type and p53 mutation cell lines. Cells were treated with 20μ M etoposide (ETO) for 6 hours to induce DNA damage, or treated with DMSO as a control. Total mRNA level of p21 and 36B4 were determined by real time quantitative PCR. Relative p21 total mRNA changes were normalized to the housekeeping gene 36B4.

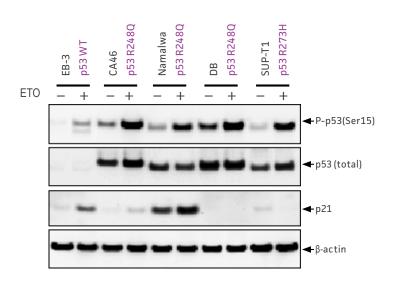


Figure 17: The indicated p53 wild-type and p53 mutation cells were treated with 20 μ M etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting assay was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin

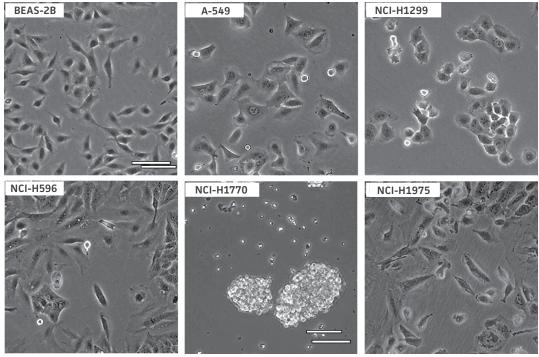
Testing performed for each ATCC cell line was completed on current (2012) distribution material. ATCC provides these data in good faith, but makes no warranty, express or implied, nor assumes any legal liability or responsibility for any purpose for which the data are used.

NON-SMALL CELL LUNG CANCER p53 HOTSPOT MUTATION CELL PANEL

Non-Small Cell Lung Cancer p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2030</u>[™]) is composed of six select cell lines derived from lung tumors. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 245, 248, or 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug target-ing or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

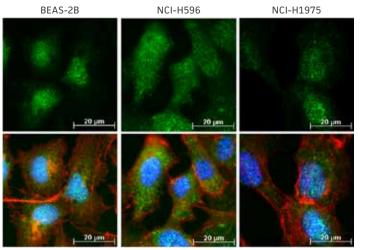
ATCC [®] No.	Name	Tissue	Histology	Tumor Source	TP53 status	Zygosity	Gene mutation [†]	Protein Sequence⁺
<u>CRL-9609</u> ™	BEAS-2B	lung	normal tissue,S V-40 immortalized	NA	WT	-	-	-
<u>CCL-185</u> ™	A549	lung	non-small cell lung carcinoma	primary	WT	-	-	-
<u>CRL-5803</u> ™	NCI-H1299	lung	non-small cell lung carcinoma	metastasis (lymph node)	NULL	homozygous	c.(del)	-
<u>HTB-178</u> ™	NCI-H596	lung	adenosquamous carcinoma	primary	MUT	homozygous	c.733G>T	p.G245C
<u>CRL-5893</u> ™	NCI-H1770	lung	non-small cell lung carcinoma	metastasis (lymph node)	MUT	homozygous	c.741 742CC>TT	p.R248W
<u>CRL-5908</u> ™	NCI-H1975	lung	adenocarcinoma	primary	MUT	homozygous	c.818G>A	p.R273H

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



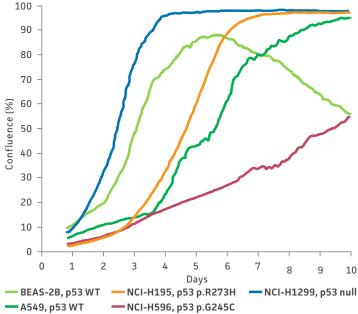
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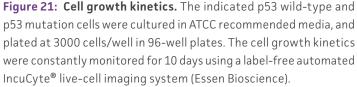
Figure 18: Cell morphology of the six cell lines in the Non-Small Cell Lung Cancer p53 Hotspot Mutation Cell Panel. The two p53 wildtype lung cell lines, BEAS-2B and A549, one p53 null cell line, NCI-H1299, and three p53 hotspot mutation lung cancer cell lines, NCI-H594, NCI-H1770, and NCI-H1975, were maintained in ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.

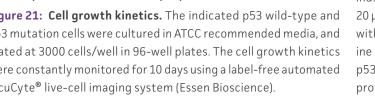


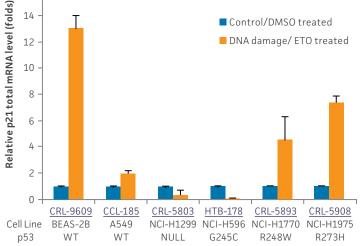
IF staining: p53; F-actin; nuclei

Figure 19: Cellular localization of p53. The indicated p53 wild-type and p53 mutation cells were grow on collagen-coated coverslips. Cells were fixed with 4% paraformaldehyde. p53 was stained with p53 primary antibody and Alexa Fluor 488 secondary antibody (green). F-actin was visualized with phalloidin Alexa Fluor 594 (red). Nuclei of the cells were visualized with Hoechst 33342 (blue). Single florescence channel images of p53 staining are shown in the upper row, and multichannel merged images are shown in the bottom row.









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Figure 20: p53-target gene expression changes in response to DNA damage. The indicated cell lines were treated with 20 µM etoposide (ETO) for 6 hours to induce DNA damage, or treated with DMSO as a control. Total mRNA level of p21 and 36B4 were determined by real time quantitative PCR. Relative p21 total mRNA changes were normalized to the housekeeping gene 36B4.

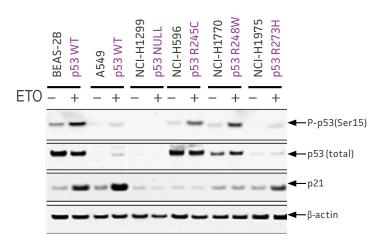


Figure 22: p53 phosphorylation in response to DNA damage. The indicated p53 wild-type and p53 mutation cells were treated with 20 µM etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting assay was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin protein was also examined as a control.

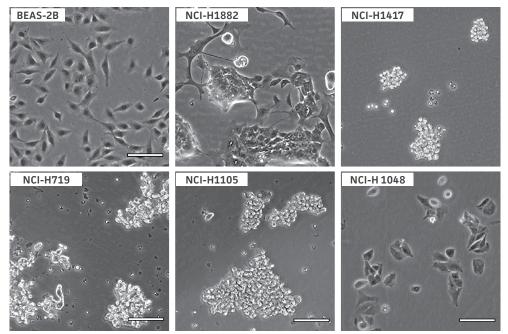
Testing performed for each ATCC cell line was completed on current (2012) distribution material. ATCC provides these data in good faith, but makes no warranty, express or implied, nor assumes any legal liability or responsibility for any purpose for which the data are used.

SMALL CELL LUNG CANCER p53 HOTSPOT MUTATION CELL PANEL

The Small Cell Lung Cancer p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2040</u>[™]) is composed of six select cell lines derived from the lung. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 175, 248, 249, or 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

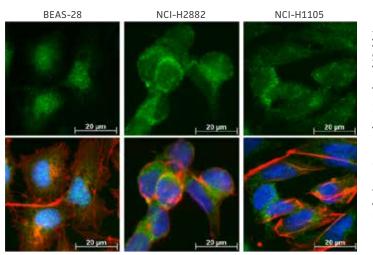
ATCC [®] No.	Name	Tissue	Histology	Tumor Source	TP53 Status	Zygosity	Gene Mutation†	Protein Sequence†
<u>CRL-9609</u> ™	BEAS-2B	lung	normal tissue,SV-40 immortalized	NA	WT	-	-	-
<u>CRL-5903</u> ™	NCI-H1882	lung	small cell lung carcinoma	metastasis (bone marrow)	WT	-	-	-
<u>CRL-5869</u> ™	NCI-H1417	lung	small cell lung carcinoma	primary	MUT	homozygous	c.524G>T	p.R175L
<u>CRL-5837</u> ™	NCI-H719	lung	small cell lung carcinoma	metastasis (bone marrow)	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-5856</u> ™	NCI-H1105	lung	small cell lung carcinoma	metastasis (lymph node)	MUT	homozygous	c.747G>T	p.R249S
<u>CRL-5853</u> ™	NCI-H1048	lung	small cell lung carcinoma	metastasis (pleural effusion)	MUT	heterozygous	c.817C>T	p.R273C

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



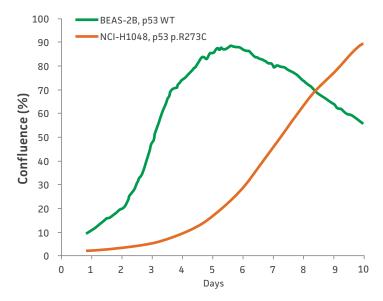
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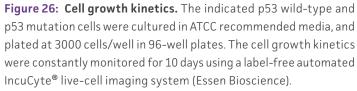
Figure 23: Cell morphology of six cell lines in the Small Cell Lung Cancer p53 Hotspot Mutation Cell Panel. Each cell line was grown using the ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.



IF staining: p53; F-actin; nuclei

Figure 24: Cellular localization of p53. The indicated p53 wild-type and p53 mutation cells were grow on collagen-coated coverslips. Cells were fixed with 4% paraformaldehyde. p53 was stained with p53 primary antibody and Alexa Fluor 488 secondary antibody (green). F-actin was visualized with phalloidin Alexa Fluor 594 (red). Nuclei of the cells were visualized with Hoechst 33342 (blue). Single florescence channel images of p53 staining are shown in the upper row, and multichannel merged images are shown in the bottom row.





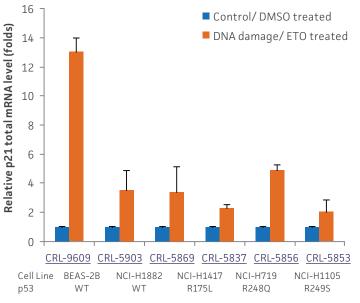


Figure 25: Real-time PCR analysis of total mRNA levels of p21, a downstream target of p53, in the indicated p53 wild-type and p53 mutation cell lines. Cells were treated with 20μ M etoposide (ETO) for 6 hours to induce DNA damage, or treated with DMSO as a control. Total mRNA level of p21 and 36B4 were determined by real time quantitative PCR. Relative p21 total mRNA changes were normalized to the housekeeping gene 36B4.

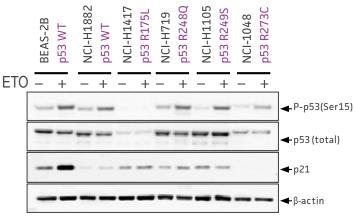


Figure 27: The indicated p53 wild-type and p53 mutation cells were treated with 20 μM etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting assay was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. μ-actin protein was also examined as a control.

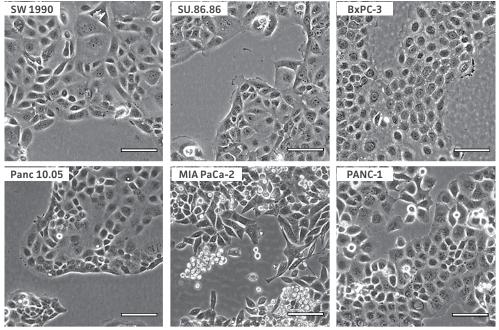
Testing performed for each ATCC cell line was completed on current (2012) distribution material. ATCC provides these data in good faith, but makes no warranty, express or implied, nor assumes any legal liability or responsibility for any purpose for which the data are used.

PANCREATIC CANCER p53 HOTSPOT MUTATION CELL PANEL

The Pancreatic Cancer p53 Hotspot Mutation Cell Panel (ATCC[®] <u>TCP-2060</u>[™]) is composed of six select adhesion cell lines derived from individuals with pancreatic cancers. This panel combines wild-type p53 cell lines with mutant p53 cell lines that carry hotspot mutations in one of the following codons: 220, 245, 248, 255, and 273. The p53 status of each line was sequenced and validated by ATCC. The panel is useful for anti-cancer drug targeting or reactivation of mutant p53, as well as studies related to p53 molecular mechanisms.

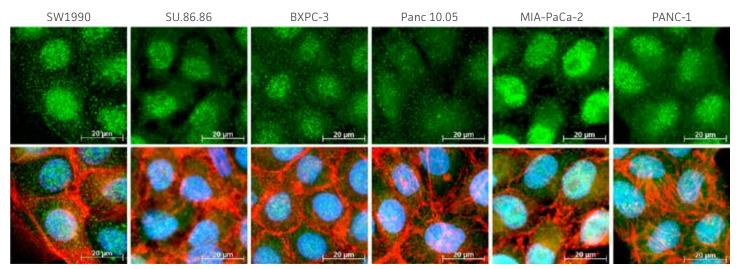
ATCC [®] No.	Name	Primary Site, Tissue	Histology	TP53 status	Zygosity	Gene mutation [†]	Protein Sequence [†]
<u>CRL-2172</u> ™	SW1990	pancreas	adenocarcinoma	WT	-	-	-
<u>CRL-1837</u> ™	SU.86.86	pancreas	adenocarcinoma	MUT	homozygous	c.733G>A	p.G245S
<u>CRL-1687</u> ™	BXPC-3	pancreas	adenocarcinoma	MUT	homozygous	c.659A>G	p.Y220C
<u>CRL-2547</u> ™	Panc 10.05	pancreas	adenocarcinoma	MUT	heterozygous	c.764T>A	p.I255N
<u>CRL-1420</u> ™	MIA-PaCa-2	pancreas	carcinoma	MUT	homozygous	c.742C>T	p.R248W
<u>CRL-1469</u> ™	PANC-1	pancreas	carcinoma	MUT	homozygous	c.818G>A	p.R273H

[†]For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.



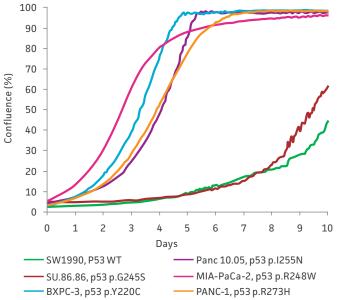
Scale Bar = 100µm

Figure 28: Cell morphology of the six cell lines in the Pancreatic cancer p53 Hotspot Mutation Cell Panel. One p53 wild-type pancreatic cancer cell line and five p53 hotspot mutation pancreatic cancer cell lines were maintained in ATCC recommended culture conditions. Cell morphology was observed under Nikon[™] microscopy, and images of the indicated cell lines were captured by Olympus[®] digital camera.



IF staining: p53; F-actin; nuclei

Figure 29: Immunofluorescence staining of p53. The indicated p53 wild-type and p53 mutation cells were grow on collagen-coated coverslips. Cells were fixed with 4% paraformaldehyde. p53 was stained with p53 primary antibody and Alexa Fluor 488 secondary antibody (green). F-actin was visualized with phalloidin Alexa Fluor 594 (red). Nuclei of the cells were visualized with Hoechst 33342 (blue). Single florescence channel images of p53 staining are shown in the upper row, and multichannel merged images are shown in the bottom row.



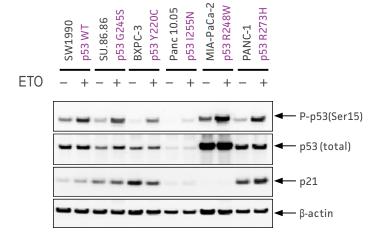
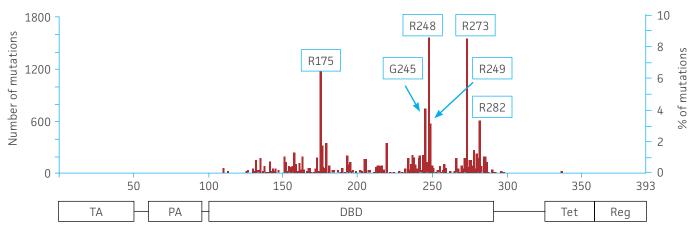


Figure 30: Cell growth kinetics. The indicated p53 wild-type and p53 mutation cells were cultured in ATCC recommended media, and plated at 3000 cells/well in 96-well plate. The cell growth kinetics were constantly monitored for 10 days using a label-free automated IncuCyte[®] live-cell imaging system (Essen Bioscience).

Figure 31: The indicated p53 wild-type and p53 mutation cells were treated with 20 μ M etoposide (ETO) for 8 hours to induce DNA damage, or treated with DMSO as a control. Western blotting was used to examine phosphorylation of p53 at Serine 15, total protein expression of p53, and expression of p21, a downstream target of p53. β -actin protein was also examined as a control.

Testing performed for each ATCC cell line was completed on current (2012) distribution material. ATCC provides these data in good faith, but makes no warranty, express or implied, nor assumes any legal liability or responsibility for any purpose for which the data are used.

VALIDATED P53 HOTSPOT MUTATION CELL LINE LIST



Christopher J. Brown et. al., Trends in Pharmacological Sciences, 2011

This list includes cell lines that contain mutations in one of the three most commonly mutated p53 codons (ie. 175, 248, and 273). Cell lines that are either wild-type or null for p53 expression and can be used as controls to facilitate your research. The mutational status of the lines listed below was validated at ATCC.

ATCC [®] No.	Designation	Tissue	Disease	TP53 status
<u>HTB-96</u> ™	U-2 OS	bone	osteosarcoma	WT
<u>HTB-25</u> ™	MDA-MB-175-VII	breast	duct carcinoma	WT
<u>HTB-27</u> ™	MDA-MB-361	breast	adenocarcinoma	WT
<u>CL-188</u> ™	LS174T	colon	adenocarcinoma	WT
<u>CCL-231</u> ™	SW48	colon	adenocarcinoma	WT
<u>TIB-190</u> ™	CESS	blood	acute myeloid leukemia (AML)	WT
<u>CRL-9609</u> ™	BEAS-2B	lung	normal tissue,SV-40 immortalized	WT
<u>CRL-5903</u> ™	NCI-H1882	lung	small cell lung carcinoma (SCLC)	WT
<u>CCL-185</u> ™	A549	lung	non-small cell lung carcinoma (NSCLC)	WT
<u>CCL-85</u> ™	EB-3	lymph node	Burkitt lymphoma, NOS	WT
<u>CRL-2172</u> ™	SW1990	pancreas	adenocarcinoma	WT
<u>CRL-1739</u> ™	AGS	stomach	adenocarcinoma	WT

Table 1: p53 Wild Type Cell Line

Table 2: p53 Null Cell Line

ATCC [®] No.	Designation	Tissue	Disease	TP53 status
<u>HTB-85</u> ™	Saos-2	bone	osteosarcoma	NULL
<u>CCL-240</u> ™	HL-60	blood	acute promyelocytic leukemia	NULL
<u>CRL-5803</u> ™	NCI-H1299	lung	non-small cell lung carcinoma (NSCLC)	NULL
<u>HTB-103</u> ™	KATO-III	stomach	carcinoma	NULL

Table 3: p53 Hotspot Codon 175 Mutation Cell Line

ATCC [®] No.	Designation	Tissue	Disease	TP53 status	Zygosity	Gene sequence†	Protein Sequence†
<u>CRL-2351</u> ™	AU565	breast	adenocarcinoma	MUT	homozygous	c.524G>A	p.R175H
<u>HTB-30</u> ™	SK-BR-3	breast	adenocarcinoma	MUT	homozygous	c.524G>A	p.R175H
<u>CCL-255</u> ™	LS123	colon	adenocarcinoma	MUT	heterozygous	c.524G>A	p.R175H
<u>CCL-119</u> ™	CCRF-CEM	blood	acute lymphoblastic leukemia (ALL)	MUT	heterozygous	c.524G>A	p.R175H
<u>CRL-2265</u> ™	CEM/C1	blood	acute lymphoblastic leukemia (ALL), camptothecin (CPT) resistant	MUT	heterozygous	c.524G>A	p.R175H
<u>CRL-5869</u> ™	NCI-H1417	lung	small cell lung carcinoma (SCLC)	MUT	homozygous	c.524G>T	p.R175L

Table 4: p53 Hotspot Codon 248 Mutation Cell Line

ATCC [®] No.	Designation	Tissue	Disease	TP53 status	Zygosity	Gene sequence†	Protein Sequence†
<u>CRL-2315</u> ™	HCC70	breast	duct carcinoma	MUT	homozygous	c.743G>A	p.R248Q
<u>CCL-220</u> ™	COLO 320DM	colon	adenocarcinoma	MUT	homozygous	c.742C>T	p.R248W
<u>CRL-2724</u> ™	KASUMI-1	blood	acute myeloid leukemia (AML)	MUT	homozygous	c.743G>A	p.R248Q
<u>CCL-119</u> ™	CCRF-CEM	blood	acute lymphoblastic leukemia (ALL)	MUT	heterozygous	c.524G>A	p.R175H
<u>CRL-5893</u> ™	NCI-H1770	lung	non-small cell lung carcinoma (NSCLC)	MUT	homozygous	c.741-742CC>TT	p.R248W
<u>CRL-5837</u> ™	NCI-H719	lung	small cell lung carcinoma (SCLC)	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-1648</u> ™	CA46	lymph node	Burkitt lymphoma	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-1432</u> ™	Namalwa	lymph node	Burkitt lymphoma, carry EBV	MUT	homozygous	c.743G>A	p.R248Q
<u>CRL-2289</u> ™	DB	lymph node	large B-cell lymphoma	MUT	heterozygous	c.743G>A	p.R248Q
<u>CRL-1420</u> ™	MIA-PaCa-2	pancreas	carcinoma	MUT	homozygous	c.742C>T	p.R248W

Table 5: p53 Hotspot Codon 273 Mutation Cell Line

ATCC [®] No.	Designation	Tissue	Disease	TP53 status	Zygosity	Gene sequence⁺	Protein Sequence†
<u>HTB-132</u> ™	MDA-MB-468	breast	adenocarcinoma	MUT	homozygous	c.818G>A	p.R273H
<u>CRL-2314</u> ™	HCC38	breast	ductal carcinoma	MUT	homozygous	c.818G>T	p.R273L
<u>CCL-218</u> ™	WiDr	colon	adenocarcinoma	MUT	homozygous	c.818G>A	p.R273H
<u>CRL-1621</u> ™	ARH-77	blood	plasma cell leukemia, carry EBV	MUT	homozygous	c.818G>A	p.R273H
<u>CRL-5853</u> ™	NCI-H1048	lung	small cell lung carcinoma (SCLC)	MUT	heterozygous	c.140delC	p.P47FS*76
<u>CRL-5908</u> ™	NCI-H1975	lung	non-small cell lung carcinoma (NSCLC)	MUT	homozygous	c.818G>A	p.R273H
<u>CRL-1942</u> ™	SUP-T1	lymph node	T cell lymphoblastic lymphoma	MUT	heterozygous	c.743G>A	p.R248Q
<u>CRL-1469</u> ™	PANC-1	pancreas/duct	carcinoma	MUT	homozygous	c.818G>A	p.R273H

Table 6: Other p53 hotspot mutation cell lines

ATCC [®] No.	Designation	Tissue	Disease	TP53 status	Gene sequence ⁺	Protein Sequence ⁺
<u>CRL-1687</u> ™	BXPC-3	pancreas	adenocarcinoma	MUT	c.659A>G	p.Y220C
<u>CRL-1837</u> ™	SU.86.86	pancreas	adenocarcinoma	MUT	c.733G>A	p.G245S
<u>CRL-2158</u> ™	LS-1034	colon	adenocarcinoma	MUT	c.733G>A	p.G245S
<u>HTB-178</u> ™	NCI-H596	lung	non-small cell lung carcinoma (NSCLC)	MUT	c.733G>T	p.G245C
<u>CRL-5856</u> ™	NCI-H1105	lung	small cell lung carcinoma (SCLC)	MUT	c.747G>T	p.R249S
<u>HTB-122</u> ™	BT-549	breast	duct carcinoma	MUT	c.747G>C	p.R249S
<u>CRL-2547</u> ™	Panc 10.05	pancreas	adenocarcinoma	MUT	c.764T>A	p.I255N

p53 MUTATION CELL LINES IN COSMIC DATABASE

Tumor source	Histology	Zygosity	Gene Sequencet	Protein Sequencet	Name	ATCC [®] No.
primary	Carcinoma,	homozygous	c.577C>T	p.H193Y	SW-13	CCL-105™
primary	primary small cell	nomozygous	0.377021	p.111331	200-12	<u>CCL-105</u>
Table 8: Bone						
Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence [†]	Name	ATCC [®] No.
primary	Osteosarcoma	homozygous	c.1_1182del1182	p.0?	Saos-2	<u>HTB-85</u> ™
primary	Osteosarcoma	homozygous	c.467G>C	p.R156P	HOS	<u>CRL-1543</u> ™
Table 9: Bone Mar	row					
Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence [†]	Name	ATCC [®] No.
primary	Leukemia, acute myelogenous	homozygous	c.672+1G>A	p.?	KG-1	<u>CCL-246</u> ™
primary	Leukemia, chronic myelogenous	homozygous	c.697_699delCAC	p.H233del	MEG-01	<u>CRL-2021</u> ™
metastasis, pleural effusion	Leukemia, chronic myelogenous	homozygous	c.406_407insC	p.Q136fs*13	K-562	<u>CCL-243</u> ™
Table 10: Brain						
Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Glioblastoma, astrocytoma	homozygous	c.638G>A	p.R213Q	U-118 MG	<u>HTB-15</u> ™
primary	Glioblastoma, multiforme	homozygous	c.711G>A	p.M237I	T98G	<u>CRL-1690</u> ™
primary	Astrocytoma	homozygous	c.817C>T	p.R273C	SW 1088	<u>HTB-12</u> ™
primary	Astrocytoma	heterozygous	c.817C>T	p.R273C	SW 1783	<u>HTB-13</u> ™
primary	Astrocytoma	heterozygous	c.818G>A	p.R273H	SW 1783	<u>HTB-13</u> ™
metastasis, bone marrow	Neuroblastoma, embryonal	homozygous	c.329G>T	p.R110L	SK-N-DZ	<u>CRL-2149</u> ™
metastasis, bone marrow	Neuroblastoma, embryonal	homozygous	c.737T>G	p.M246R	SK-N-FI	<u>CRL-2142</u> ™
Table 11: Breast						
Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, primary ductal	homozygous	c.1024C>T	p.R342*	UACC-893	<u>CRL-1902</u> ™
primary	Carcinoma, primary ductal	homozygous	c.220_226delGC- CCCTG	p.A74fs*47	HCC1419	<u>CRL-2326</u> ™
primary	Carcinoma, primary ductal	homozygous	c.322_324delGGT	p.G108del	HCC1187	<u>CRL-2322</u> ™
primary	Carcinoma	homozygous	c.394A>C	p.K132Q	BT-20	<u>HTB-19</u> ™
primary	Carcinoma, ductal	homozygous	c.488A>G	p.Y163C	HCC1954	<u>CRL-2338</u> ™
primary	Carcinoma, primary ductal	homozygous	c.524G>A	p.R175H	HCC1395	<u>CRL-2324</u> ™
primary	Carcinoma, primary ductal	homozygous	c.659A>G	p.Y220C	HCC1419	<u>CRL-2326</u> ™
primary	Carcinoma, primary ductal	homozygous	c.673-2A>T	p.?	HCC1599	<u>CRL-2331</u> ™
primary	Carcinoma, primary ductal	homozygous	c.743G>A	p.R248Q	HCC70	<u>CRL-2315</u> ™
primary	Carcinoma, primary ductal	homozygous	c.743G>A	p.R248Q	HCC1143	<u>CRL-2321</u> ™
primary	Carcinoma, ductal, papillary	homozygous	c.747G>C	p.R249S	BT-549	<u>HTB-122</u> ™

Table 11: Breast (continued)

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, primary acantholytic squamous cell	homozygous	c.766_767insAA	p.T256fs*90	HCC1806	<u>CRL-2335</u> ™
primary	Carcinoma, primary ductal	homozygous	c.818G>T	p.R273L	HCC38	<u>CRL-2314</u> ™
primary	Carcinoma, primary ductal	homozygous	c.847C>T	p.R283C	HCC2218	<u>CRL-2343</u> ™
primary	Carcinoma, ductal	homozygous	c.853G>A	p.E285K	BT-474	<u>HTB-20</u> ™
primary	Carcinoma, primary metaplastic	heterozygous	c.880G>T	p.E294*	HCC1569	<u>CRL-2330</u> ™
primary	Carcinoma, primary ductal	homozygous	c.916C>T	p.R306*	HCC1937	<u>CRL-2336</u> ™
metastasis, pleural effusion	Carcinoma, medulallary	homozygous	c.261_286delAGC- CCCCTCCTGGC- CCCTGTCATCTT	p.A88fs*52	MDA-MB-157	<u>HTB-24</u> ™
metastasis, pleural effusion	Adenocarcinoma	homozygous	c.524G>A	p.R175H	AU565	<u>CRL-2351</u> ™
metastasis, pleural effusion	Carcinoma, ductal	homozygous	c.580C>T	p.L194F	T-47D	<u>HTB-133</u> ™
metastasis, pleural effusion	Adenocarcinoma	homozygous	c.707A>G	p.Y236C	MDA-MB-415	<u>HTB-128</u> ™
metastasis, pleural effusion	Adenocarcinoma	homozygous	c.818G>A	p.R273H	MDA-MB-468	<u>HTB-132</u> ™
metastasis, pleural effusion	Adenocarcinoma	homozygous	c.839G>A	p.R280K	MDA-MB-231	<u>HTB-26</u> ™
metastasis, pleural effusion	Adenocarcinoma	homozygous	c.839G>C	p.R280T	CAMA-1	<u>HTB-21</u> ™

Table 12: Caecum

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma	heterozygous	c.378C>A	p.Y126*	LS411N	<u>CRL-2159</u> ™
primary	Carcinoma	homozygous	c.733G>A	p.G245S	LS1034	<u>CRL-2158</u> ™
primary	Carcinoma	heterozygous	c.817C>T	p.R273C	SNU-C2B	<u>CCL-250</u> ™
primary	Carcinoma	heterozygous	c.818G>A	p.R273H	SNU-C2B	<u>CCL-250</u> ™
metastasis, abdominal wall	Adenocarcinoma	homozygous	c.818G>A	p.R273H	NCI-H508	<u>CCL-253</u> ™
metastasis, ascites	Adenocarcinoma	homozygous	c.672G>T	p.E224D	NCI-H716	<u>CCL-251</u> ™
metastasis, common duct node	Adenocarcinoma	homozygous	c.473G>T	p.R158L	NCI-H747	<u>CCL-252</u> ™

Table 13: Cerebellum

Tumor source	Histology	Zygosity	Gene Sequencet	Protein Sequence†	Name	ATCC [®] No.
primary	Medulloblastoma, desmoplastic	homozygous	c.725G>T	p.C242F	Daoy	<u>HTB-186</u> ™
primary	Neuroectoderm, primitive, malignant	homozygous	c.823T>G	p.C275G	PFSK-1	<u>CRL-2060</u> ™

Table 14: Cervix

0

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma	homozygous	c.817C>T	p.R273C	C-33 A	<u>HTB-31</u> ™
metastasis, lymph node	Carcinoma	homozygous	c.734G>T	p.G245V	HT-3	<u>HTB-32</u> ™

Table 15: Colon

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma	heterozygous	c.1101-2A>C	р.?	HCT-15	<u>CCL-225</u> ™
primary	Adenocarcinoma	homozygous	c.476C>A	p.A159D	SW1116	<u>CCL-233</u> ™
primary	Adenocarcinoma	heterozygous	c.524G>A	p.R175H	LS123	<u>CCL-255</u> ™
primary	Adenocarcinoma	homozygous	c.610G>T	p.E204*	C2BBe1	<u>CRL-2102</u> ™
primary	Adenocarcinoma	homozygous	c.712_725delTG- TAACAGTTCCTG	p.C238fs*21	SW1417	<u>CCL-238</u> ™
primary	Adenocarcinoma	heterozygous	c.722C>T	p.S241F	HCT-15	<u>CCL-225</u> ™
primary	Adenocarcinoma	homozygous	c.742C>T	p.R248W	COLO 320HSR	<u>CCL-220.1</u> ™
primary	Adenocarcinoma	homozygous	c.818G>A	p.R273H	HT-29	<u>HTB-38</u> ™
metastasis, ascites	Adenocarcinoma	homozygous	c.308_333>TA	p.Y103_L111>L	COLO 205	<u>CCL-222</u> ™
metastasis, lung	Carcinoma	homozygous	c.376-1G>T	р.?	Т84	<u>CCL-248</u> ™
metastasis, lymph node	Adenocarcinoma	homozygous	c.818G>A	p.R273H	SW620	<u>CCL-227</u> ™
metastasis, lymph node	Adenocarcinoma	homozygous	c.925C>T	p.P309S	SW620	<u>CCL-227</u> ™
metastasis, ovary	Adenocarcinoma	homozygous	c.785G>T	p.G262V	SW 626	<u>HTB-78</u> ™
metastasis, peritoneum	Adenocarcinoma	homozygous	c.497C>A	p.S166*	SNU-C1	<u>CRL-5972</u> ™
Table 16: Connect	ive Tissue					
Tumor source	Histology	Zygosity	Gene Sequence [†]	Protein Sequence [†]	Name	ATCC [®] No.
primary	Fibrosarcoma	homozygous	c.637C>T	p.R213*	SW 684	<u>HTB-91</u> ™
primary	Liposarcoma	homozygous	c.752T>A	p.I251N	SW 872	<u>HTB-92</u> ™
Table 17: Eye, Reti	na					
Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.

primary Retinoblastoma heterozygous c.292C>T p.P98S WERI-Rb-1 <u>HTB-169</u> ™	Tunior Source	mstoregy	Lygosity	dente bequentee	Troteinsequence	Itallie	/1100 1101
	primary	Retinoblastoma	heterozygous	c.292C>T	p.P98S	WERI-Rb-1	<u>HTB-169</u> ™

Table 18: Kidney

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma, renal cell	heterozygous	c.560-2A>G	p.?	786-0	<u>CRL-1932</u> ™
primary	Adenocarcinoma, renal cell	heterozygous	c.832C>G	p.P278A	786-0	<u>CRL-1932</u> ™
metastasis, pleural effusion	Tumor, Wilms'	homozygous	c.733G>A	p.G245S	SK-NEP-1	<u>HTB-48</u> ™

Table 19: Liver

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, hepatocellular	homozygous	c.481G>A	p.A161T	SNU-449	<u>CRL-2234</u> ™
primary	Carcinoma, hepatocellular, pleomorphic	homozygous	c.490A>T	p.K164*	SNU-387	<u>CRL-2237</u> ™
primary	Carcinoma, hepatocellular	heterozygous	c.715A>G	p.N239D	SNU-475	<u>CRL-2236</u> ™
primary	Carcinoma, hepatocellular	homozygous	c.747G>T	p.R249S	PLC/PRF/5	<u>CRL-8024</u> ™
primary	Carcinoma, hepatocellular	heterozygous	c.785G>A	p.G262D	SNU-475	<u>CRL-2236</u> ™

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Table 20: Lung

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma, large cell	heterozygous	c.430C>T	p.Q144*	NCI-H1581	<u>CRL-5878</u> ™
primary	Carcinoma, squamous cell	homozygous	c.438G>A	p.W146*	NCI-H520	<u>HTB-182</u> ™
primary	Carcinoma, small cell	homozygous	c.440T>A	p.V147D	NCI-H1963	<u>CRL-5982</u> ™
primary	Carcinoma, squamous cell	homozygous	c.472C>G	p.R158G	NCI-H2170	<u>CRL-5928</u> ™
primary	Carcinoma, squamous cell	homozygous	c.499C>T	p.Q167*	SW 900	<u>HTB-59</u> ™
primary	Carcinoma, small cell	homozygous	c.524G>T	p.R175L	NCI-H1417	<u>CRL-5869</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.527G>A	p.C176Y	NCI-H1651	<u>CRL-5884</u> ™
primary	Carcinoid, atypical	homozygous	c.528C>G	p.C176W	NCI-H720	<u>CRL-5838</u> ™
primary	Carcinoma, small cell	homozygous	c.528C>G	p.C176W	SHP-77	<u>CRL-2195</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.572delC	p.P191fs*56	NCI-H522	<u>CRL-5810</u> ™
primary	Adenocarcinoma	heterozygous	c.578A>G	p.H193R	SK-LU-1	<u>HTB-57</u> ™
primary	Carcinoma, anaplastic	homozygous	c.586C>T	p.R196*	Calu-6	<u>HTB-56</u> ™
primary	Adenocarcinoma, non-small cell	heterozygous	c.625A>T	p.R209*	NCI-H1793	<u>CRL-5896</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.659A>G	p.Y220C	NCI-H2342	<u>CRL-5941</u> ™
primary	Carcinoid	homozygous	c.681_681delT	p.D228fs*19	UMC-11	<u>CRL-5975</u> ™
primary	Carcinoma, small cell lung cancer	heterozygous	c.722C>T	p.S241F	DMS 53	<u>CRL-2062</u> ™
primary	Carcinoma, adenosquamous	homozygous	c.733G>T	p.G245C	NCI-H596	<u>HTB-178</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.738G>C	p.M246I	NCI-H23	<u>CRL-5800</u> ™
primary	Carcinoma, small cell	homozygous	c.783-2A>C	p.?	NCI-H2227	<u>CRL-5934</u> ™
primary	Adenocarcinoma, non-small cell	heterozygous	c.818G>A	p.R273H	NCI-H1793	<u>CRL-5896</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.818G>A	p.R273H	NCI-H1975	<u>CRL-5908</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.818G>T	p.R273L	NCI-H1734	<u>CRL-5891</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.818G>T	p.R273L	NCI-H1838	<u>CRL-5899</u> ™
primary	Carcinoma, non-small cell	homozygous	c.879_880GG>CT	p.E294>*	NCI-H810	<u>CRL-5816</u> ™
primary	Adenocarcinoma, squamous cell	homozygous	c.919+1G>T	p.?	NCI-H1703	<u>CRL-5889</u> ™
primary	Adenocarcinoma, non-small cell	homozygous	c.991C>T	p.Q331*	NCI-H2228	<u>CRL-5935</u> ™
metastasis, adrenal gland	Carcinoma, small cell	homozygous	c.844C>G	p.R282G	NCI-H510A	<u>HTB-184</u> ™
metastasis, ascites	Carcinoma, small cell	homozygous	c.783-1G>T	p.?	NCI-H1694	<u>CRL-5888</u> ™
metastasis, ascites	Adenocarcinoma, non-small cell	homozygous	c.818G>A	p.R273H	NCI-H2405	<u>CRL-5944</u> ™
metastasis, bone marrow	Carcinoma, small cell	homozygous	c.469G>T	p.V157F	NCI-H2196	<u>CRL-5932</u> ™

Table 20: Lung (continued)

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
metastasis, bone marrow	Carcinoma, small cell	homozygous	c.673-2A>C	p.?	NCI-H1092	<u>CRL-5855</u> ™
metastasis, bone marrow	Carcinoma, small cell	homozygous	c.673-2A>T	р.?	NCI-H209	<u>HTB-172</u> ™
netastasis, bone narrow	Carcinoma, small cell	homozygous	c.707A>G	p.Y236C	NCI-H345	<u>HTB-180</u> ™
netastasis, bone narrow	Carcinoma, small cell	homozygous	c.743G>A	p.R248Q	NCI-H719	<u>CRL-5837</u> ™
netastasis, bone narrow	Carcinoma, small cell	homozygous	c.743G>T	p.R248L	NCI-H1618	<u>CRL-5879</u> ™
netastasis, bone narrow	Carcinoma, small cell	homozygous	c.953_971del19	p.P318fs*21	NCI-H146	<u>HTB-173</u> ™
netastasis, bone narrow	Carcinoma, small cell	homozygous	c.97-1G>C	p.?	NCI-H711	CRL-5836™
netastasis, bone narrow	Carcinoma, small cell variant	homozygous	c.97-1G>C	р.?	NCI-H526	<u>CRL-5811</u> ™
netastasis, brain	Carcinoma, small cell	homozygous	c.830G>T	p.C277F	NCI-H250	<u>CRL-5828</u> ™
netastasis, liver	Carcinoma, small cell	homozygous	c.463A>C	p.T155P	DMS 153	<u>CRL-2064</u> ™
netastasis, liver	Adenocarcinoma, non-small cell	homozygous	c.725G>T	p.C242F	NCI-H1755	<u>CRL-5892</u> ™
netastasis, lymph 10de	Carcinoma, small cell	homozygous	c.1001G>T	p.G334V	NCI-H1184	<u>CRL-5858</u> ™
netastasis, lymph 10de	Adenocarcinoma	homozygous	c.104_105insT	p.L35fs*8	NCI-H1648	<u>CRL-5882</u> ™
netastasis, lymph 10de	Adenocarcinoma, non-small cell	homozygous	c.184G>T	p.E62*	NCI-H838	<u>CRL-5844</u> ™
netastasis, lymph 10de	Carcinoma, small cell	homozygous	c.193A>T	p.R65*	NCI-H2330	<u>CRL-5940</u> ™
netastasis, lymph 10de	Adenocarcinoma, non-small cell	homozygous	c.461G>T	p.G154V	NCI-H2291	<u>CRL-5939</u> ™
netastasis, lymph Iode	Carcinoma, small cell variant	homozygous	c.464C>A	p.T155N	NCI-H524	<u>CRL-5831</u> ™
netastasis, lymph 10de	Adenocarcinoma, non-small cell	homozygous	c.469G>T	p.V157F	NCI-H2087	<u>CRL-5922</u> ™
netastasis, lymph Iode	Carcinoma,large cell	homozygous	c.473G>T	p.R158L	NCI-H661	<u>HTB-183</u> ™
netastasis, lymph 10de	Carcinoma, non-small cell	homozygous	c.492G>T	p.K164N	NCI-H650	<u>CRL-5835</u> ™
netastasis, lymph 10de	Carcinoma, small cell	homozygous	c.537T>G	p.H179Q	NCI-H1436	<u>CRL-5871</u> ™
netastasis, lymph 10de	Carcinoma, small cell	homozygous	c.625A>T	p.R209*	NCI-H2141	<u>CRL-5927</u> ™
netastasis, lymph Iode	Carcinoma,large cell	heterozygous	c.644G>T	p.S215I	NCI-H661	<u>HTB-183</u> ™
netastasis, lymph Iode	Carcinoma, small cell	homozygous	c.658T>G	p.Y220D	NCI-H2029	<u>CRL-5913</u> ™
netastasis, lymph Iode	Carcinoma, small cell	homozygous	c.659A>G	p.Y220C	NCI-H748	<u>CRL-5841</u> ™
netastasis, lymph 10de	Carcinoma, small cell	homozygous	c.725G>C	p.C242S	NCI-H889	<u>CRL-5817</u> ™
netastasis, lymph 10de	Adenocarcinoma, non-small cell	homozygous	c.726C>G	p.C242W	NCI-H1993	<u>CRL-5909</u> ™
netastasis, lymph Iode	Carcinoma, small cell	homozygous	c.733G>C	p.G245R	NCI-H1930	<u>CRL-5906</u> ™

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Table 20: Lung (continued)

Decisions, lymph ode Carcinoms, mail neuroendocrine Democrygous C74/15/42CC>TT p.R248W NCI-H1770 CRI-5832** ode Carcinoms, small homocrygous C7476>T p.R248W NCI-H1170 CRI-5832** ode Carcinoms, small homocrygous C7476>T p.R248W NCI-H1105 CRI-5856** ode Carcinoms, small homocrygous C7856>T p.67672V NCI-H1105 CRI-5912** ode Carcinoms, small homocrygous C8196>A p.R273L NCI-H1203 CRI-5912** netsatssis, lymph Aderocarcinoma, homocrygous C8196>T p.R273L NCI-H1203 CRI-5927** netsatssis, lymph Aderocarcinoma, homocrygous C8396>C p.R273L NCI-H1623 CRI-5927** netsatssis, lymph Aderocarcinoma, homocrygous C8396>C p.R233 DMS 114 CRI-5927** netsatssis, lymph Aderocarcinoma, homocrygous C1404C p.R233* DMS 114 CRI-5927** netsatssis, lymph Aderocarcinoma, homocrygous C1404C p.R218L NCI-H	Tumor source	Histology	Zygosity	Gene Sequence [†]	Protein Sequence ⁺	Name	ATCC [®] No.
non-small cell mearcades non-sma				· · ·	· · ·		
ode cell c.7856-T p.6262V NCI-H2030 CIL-5013* ode cell homozygous c.8186-A p.8273H NCI-H2030 CIL-5013* net satusik, lymph cell homozygous c.8186-A p.8273H NCI-H2030 CIL-5013* net satusik, lymph denocarcinoma, homozygous c.8186-T p.8273L NCI-H2030 CIL-5031* net satusik, lymph denocarcinoma, mall homozygous c.8386-C p.8283P NCI-H1633 CIL-5076* net satusik, lymph cell homozygous c.6370-F1 p.7273L NCI-H1643 CIL-5076* net satusik, lymph cell homozygous c.6370-F1 p.7213* NCI-H1643 CIL-5076* net satusik, lymph denocarcinoma, small homozygous c.6370-F1 p.7213* NCI-H1048 CIL-5076* net satusik, lymph denocarcinoma, small homozygous c.6370-F1 p.7475*76 NCI-H1048 CIL-505* net satusik, lymph certoma, small homozygous c.14064C p.7475*76 <	node	non-small cell,	nomozygous	L./41_/42CU>TT	p.nz40W	NCI-H1770	<u>CKL-3033</u>
ode non-systawis p.8273H NCI-H1155 CR-5618** ode Carcinoma,large homozygous c.8186-A p.8273H NCI-H2009 CR-5618** ode Adenocarcinoma homozygous c.8186-A p.8273L NCI-H2009 CR-5618** netastasis,lymph Adenocarcinoma, anall homozygous c.8186-C p.8237 NCI-H1623 CR-5628** netastasis,lymph Carcinoma, small homozygous c.6376-T p.8238P NCI-H1693 CR-5628** netastasis,lymph Adenocarcinoma, small homozygous c.6376-T p.8218* NCI-H1693 CR-5682** netastasis,lymph Adenocarcinoma, small homozygous c.6376-T p.8218* NCI-H1693 CR-5682** netastasis,lymph Adenocarcinoma, small homozygous c.6376-T p.8218* NCI-H1693 CR-5682** netastasis,lymph Carcinoma, small homozygous c.6406-T p.8218* NCI-H1208 CR-5858** netastasis,lymph Carcinoma, small homozygous c.6206-T p.	metastasis, lymph node		homozygous	c.747G>T	p.R249S	NCI-H1105	<u>CRL-5856</u> ™
inded index index index index index statistic stymph Adenocarcinoma homozygous c.8186-T p.R273L NCI-H2009 CRL5911" index statistic stymph Adenocarcinoma, non-small cell homozygous c.8186-T p.R273L NCI-H3E33 CRL5911" index statistic stymph Carcinoma, small homozygous c.8186-C p.R283P NCI-H3E33 CRL59278" index statistic stymph Carcinoma, small cell homozygous c.637C>T p.R213* DMS 114 CRL59278" index statistic stymph Adenocarcinoma, homozygous c.637C>T p.R138L NCI-H4048 CRL59278" index statistic stymph Adenocarcinoma, monzygous c.647G>T p.R138L NCI-H4048 CRL5937" index statistic pleura Carcinoma, small homozygous c.140de1C p.P476*76 NCI-H3122 CRL5937" intext statis pleura Carcinoma, small homozygous c.2026>T p.G68* NCI-H3122 CRL5937" intext statis pleura Carcinoma, small homozygous c.4016>T	metastasis, lymph node	,	homozygous	c.785G>T	p.G262V	NCI-H2030	<u>CRL-5914</u> ™
indef Function Function Function Function inde Adenocarcinoma, small homozygous c.8186-T p.8231 NCI-H1623 CRL-5881" inde Carlinoma, small homozygous c.8486>C p.8283P NCI-H64 CRL-5976" intestatasis, lymph Adenocarcinoma, non-small cell homozygous c.637C>T p.8213* DMS 114 CRL-5882" intestatasis, lymph Adenocarcinoma, small homozygous c.637C>T p.8138L NCI-H1693 CRL-5882" intestatasis, lymph Adenocarcinoma, small homozygous c.637C>T p.8138L NCI-H1693 CRL-5853* intestatasis, lymph Carcinoma, small homozygous c.140delC p.P47fs*76 NCI-H1226 CRL-5874* iffusion Carcinoma, small homozygous c.2026>T p.658* NCI-H1522 CRL-5874* iffusion Carcinoma, small homozygous c.430C>T p.0144* NCI-H1226 CRL-5929* iffusion Carcinoma, small homozygous c.430C>T p.01	metastasis, lymph node	, ,	homozygous	c.818G>A	p.R273H	NCI-H1155	<u>CRL-5818</u> ™
ode non-small cell c.R.4 non-small cell c.R.4 netastasis, lymph Carcinoma, small homozygous c.848G>C p.R283P NCI-H64 CRL-5976* netastasis, lymph Adenocarcinoma, non-small cell homozygous c.993+16-T1 p.R213* NCI-H1693 CRL-5887* netastasis, lymph Adenocarcinoma, cell cell homozygous c.637C>T p.R158L NCI-H1643 CRL-5887* netastasis, lymph Adenocarcinoma, small homozygous c.140delC p.P47fs*766 NCI-H1048 CRL-5853* retastasis, pleura Carcinoma, small homozygous c.184G>T p.662* NCI-H121C CRL-5874* retastasis, pleura Carcinoma, small homozygous c.430C>T p.668* NCI-H121C CRL-5874* retastasis, pleura Carcinoma, small homozygous c.430C>T p.6164* NCI-H121C CRL-5824* retastasis, pleura Adenocarcinoma, small homozygous c.4716>T p.0164 NCI-H212C CRL-5804* reclastasis, pleura Adenocarcinoma, small	metastasis, lymph node	Adenocarcinoma	homozygous	c.818G>T	p.R273L	NCI-H2009	<u>CRL-5911</u> ™
ode cell CRL-5887* netastasis, lymph Adenocarcinoma, small cell homozygous c.993.1G>T p.? NCI-H1693 CRL-5887* netastasis, cerinoma, small cell homozygous c.637C>T p.R213* DMS 114 CRL-5887* netastasis, cerinoma, small homozygous c.4736>T p.R158L NCI-H1048 CRL-5893* netastasis, pleural Carcinoma, small homozygous c.140delC p.P47fs*76 NCI-H1048 CRL-5893* ffusion Carcinoma, small homozygous c.184G>T p.E62* NCI-H1048 CRL-5893* ffusion Carcinoma, small homozygous c.400C>T p.E68* NCI-H1226 CRL-5892* netastasis, pleural Carcinoma, small homozygous c.400C>T p.0144* NCI-H2121 CRL-5892* ffusion Carcinoma, small homozygous c.470>T p.016L NCI-H1460 HTB-171** ffusion Carcinoma, small homozygous c.470>T p.016L NCI-H1212 CRL-5892** ffusion	metastasis, lymph node	,	homozygous	c.818G>T	p.R273L	NCI-H1623	<u>CRL-5881</u> ™
index index index netastasis, cell Carcinoma, small homozygous c.637c>T p.813* DMS 114 C.R.2066" netastasis, cell denocarcinoma, papillary homozygous c.4736>T p.8158L NCI-H411 HTE-174" netastasis, pleural Carcinoma, small heterozygous c.140delC p.947fs*76C NCI-H1226 CCL-256" netastasis, pleural Carcinoma, small homozygous c.2026>T p.668* NCI-H1226 CRL-5829" netastasis, pleural Carcinoma, small homozygous c.430C>T p.0144* NCI-H122 CRL-5829" netastasis, pleural Carcinoma, small homozygous c.430C>T p.0154V NCI-H4212 CRL-5829" netastasis, pleural Adenocarcinoma, monzygous c.4516>T p.0154V NCI-H4212 CRL-5898" netastasis, pleural Adenocarcinoma, manal homozygous c.5116>T p.016L NCI-H378 CRL-5898" netastasis, pleural Adenocarcinoma homozygous c.5276>T p.0176F NCI-H1792 CRL-5898	metastasis, lymph node		homozygous	c.848G>C	p.R283P	NCI-H64	<u>CRL-5976</u> ™
nediastinal cell netastasis, periadral fiusion Adenocarcinoma, papillary homozygous c.4736-T p.8158L NCI-H411 HTB-174" netastasis, pleural fiusion Carcinoma, small heterozygous c.140delC p.P47fs*76 NCI-H1048 GRL-5853" netastasis, pleural fiusion Carcinoma, small homozygous c.2026-T p.E62* NCI-H1226 CRL-5874" netastasis, pleural fiusion Carcinoma, small homozygous c.430C>T p.C144* NCI-H2126 CRL-5874" netastasis, pleural fiusion Carcinoma, small homozygous c.430C>T p.0144* NCI-H4217 CRL-5929" netastasis, pleural fiusion Carcinoma, small homozygous c.4610-T p.0194 NCI-H446 HTB-171" rifusion Carcinoma, small homozygous c.471A>T p.0194 NCI-H446 HTB-171" rifusion Carcinoma, small homozygous c.471A>T p.0194 NCI-H4202 CRL-5929" netastasis, pleural fifusion Adenocarcinoma, homozygous c.5276>T p.2171*	metastasis, lymph node	,	homozygous	c.993+1G>T	р.?	NCI-H1693	<u>CRL-5887</u> ™
pericardial fluidpapillarypericardialnetastasis, pleuralCarcinoma, smallheterozygousc.140delCp.P47fs*76NCI-H1048CRL-5853**netastasis, pleuralCarcinoma, small cellhomozygousc.184G>Tp.E62*NCI-H1522CRL-5874**netastasis, pleuralCarcinoma, smallhomozygousc.202G>Tp.E68*NCI-H1522CRL-5874**netastasis, pleuralCarcinoma, smallhomozygousc.430C>Tp.C144*NCI-H1522CRL-5874**netastasis, pleuralCarcinoma, smallhomozygousc.461G>Tp.0144*NCI-H2122CRL-5895**netastasis, pleuralCarcinoma, smallhomozygousc.47A>Tp.016LNCI-H2122CRL-5808**iffusioncellnon-small cellhomozygousc.511G>Tp.116LNCI-H2122CRL-5808**iffusioncellnon-small cellhomozygousc.527G>Tp.C176FNCI-H2122CRL-5895**netastasis, pleuralAdenocarcinomahomozygousc.672+1G>Ap.2171*NCI-H1792CRL-5895**netastasis, pleuralAdenocarcinomahomozygousc.672+1G>Ap.2241CNCI-H1792CRL-5883**netastasis, pleuralAdenocarcinomahomozygousc.672-CAp.2241CNCI-H1792CRL-5883**netastasis, pleuralAdenocarcinomahomozygousc.712C>Gp.R273CNCI-H1437CRL-5883**netastasis, pleuralAdenocarcinomahomozygousc.722C>Gp.R273CNCI-H1437CRL-5863** <t< td=""><td>metastasis, mediastinal</td><td></td><td>homozygous</td><td>c.637C>T</td><td>p.R213*</td><td>DMS 114</td><td><u>CRL-2066</u>™</td></t<>	metastasis, mediastinal		homozygous	c.637C>T	p.R213*	DMS 114	<u>CRL-2066</u> ™
iffusion cell retastasis, pleural Carcinoma, small cell homozygous c.1846>T p.E62* NCI-H2126 CCI_256** netastasis, pleural Carcinoma, small homozygous c.202G>T p.E68* NCI-H1522 CRI-5874** retastasis, pleural Carcinoma, small homozygous c.430C>T p.0144* NCI-H2171 CRI-5929** retastasis, pleural Carcinoma, small homozygous c.430C>T p.0154V NCI-H2171 CRI-5929** netastasis, pleural Carcinoma, small homozygous c.430C>T p.0154V NCI-H2171 CRI-5929** netastasis, pleural Adenocarcinoma, mall homozygous c.4616>T p.0154V NCI-H2122 CRI-5985** retastasis, pleural Adenocarcinoma, mall homozygous c.47A>T p.016L NCI-H378 CRI-5985** retastasis, pleural Carcinoma, small homozygous c.5716>T p.171** NCI-H199 HTB-119** retastasis, pleural Adenocarcinoma homozygous c.672+16>A p.2176F NCI-H197<	metastasis, pericardial fluid		homozygous	c.473G>T	p.R158L	NCI-H441	<u>HTB-174</u> ™
iffusion non-small cell retastasis, pleural fifusion Carcinoma, small cell homozygous c.2026>T p.E68* NCI-H1522 CRL-5874" netastasis, pleural fifusion Carcinoma, small homozygous c.430C>T p.Q144* NCI-H2171 CRL-5929" netastasis, pleural fifusion Carcinoma, small homozygous c.4616>T p.Q144* NCI-H2172 CRL-5929" netastasis, pleural fifusion Carcinoma, small homozygous c.47A>T p.Q16L NCI-H2122 CRL-5908" netastasis, pleural fifusion Carcinoma, small homozygous c.511G>T p.Q16L NCI-H2122 CRL-5908" netastasis, pleural fifusion Carcinoma, small homozygous c.527G>T p.C176F NCI-H197 CRL-5895" netastasis, pleural fifusion Adenocarcinoma non-small cell homozygous c.672+16>A p.? NCI-H197 CRL-5895" netastasis, pleural fifusion Adenocarcinoma nomozygous c.673-2A>G p.? Cal-3 HT8-55" netastasis, pleural fifusion Adenocarcrinoma nomozygous c.7116>T	metastasis, pleural effusion		heterozygous	c.140delC	p.P47fs*76	NCI-H1048	<u>CRL-5853</u> ™
iffusioncell <t< td=""><td>metastasis, pleural effusion</td><td>,</td><td>homozygous</td><td>c.184G>T</td><td>p.E62*</td><td>NCI-H2126</td><td><u>CCL-256</u>™</td></t<>	metastasis, pleural effusion	,	homozygous	c.184G>T	p.E62*	NCI-H2126	<u>CCL-256</u> ™
Iffusioncellcellnetastasis, pleural iffusionCarcinoma, small cellhomozygousc.461G>Tp.6154VNCI-H446HTB-171"*iffusioncellAdenocarcinoma, heterozygousc.47A>Tp.Q16LNCI-H2122CRL-5985"*iffusionCarcinoma, small cellhomozygousc.478A>Tp.Q16LNCI-H2122CRL-5985"*iffusionCarcinoma, small cellhomozygousc.488A>Gp.Y163CNCI-H378CRL-5985"*iffusionCarcinoma, small cellhomozygousc.511G>Tp.E171*NCI-H69HTB-119"*iffusionCarcinoma, small cellhomozygousc.527G>Tp.C176FNCI-H192CRL-5985"*iffusionAdenocarcinoma non-small cellhomozygousc.672+1G>Ap.?NCI-H1792CRL-5895"*iffusionAdenocarcinoma homozygousc.673+2A>Gp.?NCI-H1792CRL-5895"*iffusionAdenocarcinoma homozygousc.711G>Tp.M237ICalu-3HTB-55"*iffusionCarcinoma, small homozygousc.722C>Gp.S241CNCI-H187CRL-5804"*iffusionCarcinoma, small homozygousc.800G>Cp.R267PNCI-H1437CRL-5872"*iffusionCarcinoma, small homozygousc.817C>Tp.R273CNCI-H1437CRL-5853"*iffusionCarcinoma, small homozygousc.834_835TG>Ap.R280fs*65DNS 79CRL-5865"*iffusionCarcinoma, small homozygousc.834_835TG>Ap.E285KNCI-H135C <td>metastasis, pleural effusion</td> <td></td> <td>homozygous</td> <td>c.202G>T</td> <td>p.E68*</td> <td>NCI-H1522</td> <td>CRL-5874™</td>	metastasis, pleural effusion		homozygous	c.202G>T	p.E68*	NCI-H1522	CRL-5874™
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InfusioncellControlControlnetastasis, pleural iffusionCarcinoma, small cellhomozygousc.511G>Tp.E171*NCI-H69HTB-119"netastasis, pleural iffusionAdenocarcinoma, non-small cellheterozygousc.527G>Tp.C176FNCI-H2122CRL-5985"netastasis, pleural iffusionAdenocarcinoma non-small cellhomozygousc.672+1G>Ap.?NCI-H1792CRL-5895"netastasis, pleural iffusionAdenocarcinoma homozygoushomozygousc.673-2A>Gp.?NCI-H1650CRL-5883"netastasis, pleural iffusionAdenocarcinoma homozygousc.673-2A>Gp.221NCI-H1650CRL-5883"netastasis, pleural iffusionAdenocarcinoma homozygousc.673-2A>Gp.221NCI-H1650CRL-5883"netastasis, pleural iffusionAdenocarcinoma homozygousc.711G>Tp.M237ICalu-3HTB-55"netastasis, pleural iffusionAdenocarcinoma, homozygousc.722C>Gp.S241CNCI-H187CRL-5804"netastasis, pleural iffusionAdenocarcinoma, homozygousc.800G>Cp.R267PNCI-H1437CRL-5853"netastasis, pleural iffusionCarcinoma, small cellheterozygousc.817C>Tp.R273CNCI-H1048CRL-5853"netastasis, pleural iffusionCarcinoma, small cellhomozygousc.834_835TG>Ap.E285KNCI-H1355CRL-5865"netastasis, pleural iffusionAdenocarcinoma homozygousc.892G>Tp.E298*SK-MES-1HT	metastasis, pleural effusion		heterozygous	c.47A>T	p.Q16L	NCI-H2122	<u>CRL-5985</u> ™
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AffusionAdenocarcinomahomozygousc.673-2A>Gp.?NCI-H1650CRL-5883**AffusionAdenocarcinomahomozygousc.711G>Tp.M237ICalu-3HTB-55**AffusionAdenocarcinomahomozygousc.711G>Tp.M237ICalu-3LTB-55**Antestastasis, pleural AffusionCarcinoma, small cellhomozygousc.722C>Gp.S241CNCI-H187CRL-5804**Adenocarcinoma, andrestastasis, pleural AffusionAdenocarcinoma, non-small cellnonozygousc.800G>Cp.R267PNCI-H1437CRL-5872**Intestastasis, pleural affusionCarcinoma, small cellheterozygousc.817C>Tp.R273CNCI-H1048CRL-5853**Intestastasis, pleural affusionCarcinoma, small cellhomozygousc.834_835TG>Ap.R280fs*65DMS 79CRL-2049**Intestastasis, pleural affusionAdenocarcinoma cell lung cancerhomozygousc.853G>Ap.E285KNCI-H1355CRL-5865**Intestastasis, pleural affusionAdenocarcinoma cell lung cancerhomozygousc.892G>Tp.E298*SK-MES-1HTB-58**	metastasis, pleural effusion		heterozygous	c.527G>T	p.C176F	NCI-H2122	<u>CRL-5985</u> ™
Adenocarcinomahomozygousc.711G>Tp.M237lCalu-3HTB-55™Inetastasis, pleural iffusionCarcinoma, small cellhomozygousc.722C>Gp.S241CNCI-H187CRL-5804™Inetastasis, pleural iffusionCarcinoma, small cellhomozygousc.722C>Gp.R267PNCI-H1437CRL-5804™Inetastasis, pleural iffusionAdenocarcinoma, mon-small cellhomozygousc.800G>Cp.R267PNCI-H1437CRL-5872™Inetastasis, pleural iffusionCarcinoma, small cellhomozygousc.817C>Tp.R273CNCI-H1048CRL-5853™Inetastasis, pleural iffusionCarcinoma, small cell lung cancerhomozygousc.834_835TG>Ap.R280fs*65DMS 79CRL-2049™Inetastasis, pleural iffusionAdenocarcinoma cell lung cancerhomozygousc.853G>Ap.E285KNCI-H1355CRL-5865™Inetastasis, pleural iffusionCarcinoma, homozygousc.892G>Tp.E298*SK-MES-1HTB-58™	metastasis, pleural effusion	Adenocarcinoma	homozygous	c.672+1G>A	p.?	NCI-H1792	<u>CRL-5895</u> ™
InffusionCarcinoma, small cellhomozygousc.722C>Gp.S241CNCI-H187CRL-5804™Inetastasis, pleural effusionAdenocarcinoma, non-small cellhomozygousc.800G>Cp.R267PNCI-H1437CRL-5872™Inetastasis, pleural effusionCarcinoma, small cellheterozygousc.817C>Tp.R273CNCI-H1048CRL-5853™Inetastasis, pleural effusionCarcinoma, small cell lung cancerhomozygousc.834_835TG>Ap.R280fs*65DMS 79CRL-2049™Inetastasis, pleural effusionAdenocarcinoma cell lung cancerhomozygousc.853G>Ap.E285KNCI-H1355CRL-5865™Inetastasis, pleural effusionCarcinoma, homozygousc.892G>Tp.E298*SK-MES-1HTB-58™	metastasis, pleural effusion	Adenocarcinoma	homozygous	c.673-2A>G	p.?	NCI-H1650	<u>CRL-5883</u> ™
effusioncellmetastasis, pleural iffusionAdenocarcinoma, non-small cellhomozygousc.800G>Cp.R267PNCI-H1437CRL-5872™metastasis, pleural iffusionCarcinoma, small cellheterozygousc.817C>Tp.R273CNCI-H1048CRL-5853™metastasis, pleural iffusionCarcinoma, small cell lung cancerhomozygousc.834_835TG>Ap.R280fs*65DMS 79CRL-2049™metastasis, pleural iffusionAdenocarcinoma cell lung cancerhomozygousc.853G>Ap.E285KNCI-H1355CRL-5865™metastasis, pleural iffusionCarcinoma, homozygousc.892G>Tp.E298*SK-MES-1HTB-58™	metastasis, pleural effusion	Adenocarcinoma	homozygous	c.711G>T	p.M237I	Calu-3	<u>HTB-55</u> ™
Inffusionnon-small cellnetastasis, pleural iffusionCarcinoma, small cellheterozygousc.817C >Tp.R273CNCI-H1048CRL-5853™netastasis, pleural iffusionCarcinoma, small 	metastasis, pleural effusion		homozygous	c.722C>G	p.S241C	NCI-H187	<u>CRL-5804</u> ™
Instastasis, pleural offusion cell cell Carcinoma, small cell lung cancer homozygous c.834_835TG>A p.R280fs*65 DMS 79 CRL-2049™ Instastasis, pleural offusion Adenocarcinoma homozygous c.853G>A p.E285K NCI-H1355 CRL-5865™ Instastasis, pleural carcinoma, homozygous c.892G>T p.E298* SK-MES-1 HTB-58™	metastasis, pleural effusion		homozygous	c.800G>C	p.R267P	NCI-H1437	<u>CRL-5872</u> ™
Iffusion cell lung cancer cell lung cell lung cancer cell lung cell l	metastasis, pleural effusion		heterozygous	c.817C>T	p.R273C	NCI-H1048	<u>CRL-5853</u> ™
rffusion	metastasis, pleural effusion		homozygous	c.834_835TG>A	p.R280fs*65	DMS 79	<u>CRL-2049</u> ™
	metastasis, pleural effusion	Adenocarcinoma	homozygous	c.853G>A	p.E285K	NCI-H1355	<u>CRL-5865</u> ™
	metastasis, pleural effusion		homozygous	c.892G>T	p.E298*	SK-MES-1	<u>HTB-58</u> ™

Table 20: Lung (continued)

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
metastasis, soft tissue	Carcinoma, small cell	homozygous	c.1024C>T	p.R342*	NCI-H774	<u>CRL-5842</u> ™
metastasis, soft tissue	Adenocarcinoma	homozygous	c.743G>T	p.R248L	NCI-H1573	<u>CRL-5877</u> ™

Table 21: Lung, bronchus

Tumor source	Histology	Zygosity	Gene Sequence [†]	Protein Sequence [†]	Name	ATCC [®] No.
primary	Carcinoid	homozygous	c.496_497ins9	p.Q165_ S166insYKQ	NCI-H727	<u>CRL-5815</u> ™
primary	Carcinoma	heterozygous	c.824G>T	p.C275F	ChaGo-K-1	<u>HTB-168</u> ™
primary	Carcinoma	homozygous	c.97-1G>C	р.?	ChaGo-K-1	<u>HTB-168</u> ™

Table 22: Lymph node

Tumor source	Histology	Zygosity	Gene Sequence [†]	Protein Sequence ⁺	Name	ATCC [®] No.
metastasis, ovary	Lymphoma, Burkitt's	homozygous	c.731G>A	p.G244D	EB2	<u>HTB-61</u> ™

Table 23: Lymphoid

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Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Leukemia, acute lymphocytic	heterozygous	c.541C>T	p.R181C	Reh	<u>CRL-8286</u> ™
primary	Lymphoma, cutaneous	homozygous	c.586C>T	p.R196*	H9	<u>HTB-176</u> ™
primary	Lymphoma, Burkitt's	homozygous	c.638G>A	p.R213Q	Raji	<u>CCL-86</u> ™
primary	Lymphoma, Burkitt's	heterozygous	c.700T>C	p.Y234H	Raji	<u>CCL-86</u> ™
primary	Lymphoma, Burkitt's	homozygous	c.743G>A	p.R248Q	CA46	<u>CRL-1648</u> ™
primary	Lymphoma, Burkitt's	homozygous	c.760_761AT>GA	p.I254D	Ramos.2G6.4C10	<u>CRL-1923</u> ™
primary	Leukemia, acute lymphoblastic	heterozygous	c.916C>T	p.R306*	MOLT-4	<u>CRL-1582</u> ™
metastasis, ascites	Lymphoma, Burkitt's	homozygous	c.394A>C	p.K132Q	Jiyoye	<u>CCL-87</u> ™
metastasis, ascites	Lymphoma, non-Hodgkin's	homozygous	c.412G>C	p.A138P	RL	<u>CRL-2261</u> ™
metastasis, ascites	Lymphoma, Burkitt's	heterozygous	c.473G>A	p.R158H	ST486	<u>CRL-1647</u> ™
metastasis, ascites	Lymphoma, diffuse mixed	heterozygous	c.646G>A	p.V216M	HT	<u>CRL-2260</u> ™
metastasis, ascites	Lymphoma, undifferentiated	homozygous	c.713G>A	p.C238Y	MC116	<u>CRL-1649</u> ™
metastasis, ascites	Lymphoma, Burkitt's	heterozygous	c.715A>G	p.N239D	ST486	<u>CRL-1647</u> ™
metastasis, ascites	Lymphoma, large B cell	heterozygous	c.743G>A	p.R248Q	DB	<u>CRL-2289</u> ™
metastasis, ascites	Lymphoma, diffuse mixed	heterozygous	c.818G>A	p.R273H	HT	<u>CRL-2260</u> ™
metastasis, pleural effusion	Lymphoma, histiocytic	homozygous	c.559+1G>A	р.?	TUR	<u>CRL-2367</u> ™
metastasis, pleural effusion	Lymphoma, T-cell lymphoblastic	heterozygous	c.743G>A	p.R248Q	SUP-T1	<u>CRL-1942</u> ™
metastasis, pleural effusion	Lymphoma, T-cell lymphoblastic	heterozygous	c.800G>T	p.R267L	SUP-T1	<u>CRL-1942</u> ™
metastasis, pleural effusion	Lymphoma, T-cell lymphoblastic	heterozygous	c.818G>A	p.R273H	SUP-T1	<u>CRL-1942</u> ™

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Table 24: Muscle

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Rhabdomyosarcoma	homozygous	c.354_355insCA	p.A119fs*5	A-673	<u>CRL-1598</u> ™
primary	Rhabdomyosarcoma	homozygous	c.742C>T	p.R248W	RD	<u>CCL-136</u> ™

Table 25: Ovary

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma	homozygous	c.406C>T	p.Q136*	Caov-3	<u>HTB-75</u> ™
metastasis, ascites	Adenocarcinoma	homozygous	c.267delC	p.S90fs*33	SK-OV-3	<u>HTB-77</u> ™
metastasis, fallopian tube	Adenocarcinoma	homozygous	c.440T>A	p.V147D	Caov-4	<u>HTB-76</u> ™

Table 26: Pancreas

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma	homozygous	c.376-1G>T	р.?	Panc 03.27	<u>CRL-2549</u> ™
primary	Adenocarcinoma	homozygous	c.659A>G	p.Y220C	BxPC-3	<u>CRL-1687</u> ™
primary	Carcinoma	homozygous	c.742C>T	p.R248W	MIA PaCa-2	<u>CRL-1420</u> ™
primary	Adenocarcinoma	heterozygous	c.764T>A	p.1255N	Panc 10.05	<u>CRL-2547</u> ™
metastasis, ascites	Adenocarcinoma	homozygous	c.403delT	p.C135fs*35	AsPC-1	<u>CRL-1682</u> ™
metastasis, ascites	Adenocarcinoma	homozygous	c.451C>T	p.P151S	HPAF-II	<u>CRL-1997</u> ™
metastasis, liver	Adenocarcinoma, ductal	homozygous	c.724T>C	p.C242R	CFPAC-1	<u>CRL-1918</u> ™

Table 27: Peripheral blood

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Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Leukemia, acute promyelocytic	homozygous	c.1_1182del1182	p.0?	HL-60	<u>CCL-240</u> ™
primary	Leukemia, acute T cell	heterozygous	c.1083delG	p.G361fs*8	J.RT3-T3.5	<u>TIB-153</u> ™
primary	Lymphoma, cutaneous T cell	homozygous	c.376-1G>A	р.?	HH	<u>CRL-2105</u> ™
primary	Lymphoma, Burkitt's	heterozygous	c.455C>T	p.P152L	GA-10 (Clone 4)	<u>CRL-2393</u> ™
primary	Leukemia, acute monocytic	homozygous	c.520_545del26	p.R174fs*3	THP-1	<u>TIB-202</u> ™
primary	Leukemia, acute lymphoblastic	heterozygous	c.524G>A	p.R175H	CCRF-CEM	<u>CCL-119</u> ™
primary	Leukemia, acute T cell	heterozygous	c.586C>T	p.R196*	J.RT3-T3.5	<u>TIB-153</u> ™
primary	Lymphoma, Burkitt's	heterozygous	c.695T>A	p.I232N	GA-10 (Clone 4)	<u>CRL-2393</u> ™
primary	Leukemia, acute lymphoblastic	heterozygous	c.743G>A	p.R248Q	CCRF-CEM	<u>CCL-119</u> ™
primary	Leukemia, acute myeloblastic	homozygous	c.743G>A	p.R248Q	Kasumi-1	<u>CRL-2724</u> ™
primary	Lymphoma, Burkitt's	heterozygous	c.797G>A	p.G266E	Daudi	<u>CCL-213</u> ™
primary	Leukemia, acute lymphoblastic	homozygous	c.814G>A	p.V272M	Loucy	<u>CRL-2629</u> ™
primary	Leukemia, plasma cell	homozygous	c.818G>A	p.R273H	ARH-77	<u>CRL-1621</u> ™
primary	Plasmacytoma, myeloma	homozygous	c.853G>A	p.E285K	RPMI 8226	<u>CCL-155</u> ™
primary	Leukemia, acute monocytic	homozygous	c.993+2T>G	p.?	AML-193	<u>CRL-9589</u> ™

Table 28: Pharynx

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, squamous cell	heterozygous	c.376-1G>A	р.?	FaDu	<u>HTB-43</u> ™
primary	Carcinoma, squamous cell	heterozygous	c.743G>T	p.R248L	FaDu	<u>HTB-43</u> ™
metastasis, pleural effusion	Carcinoma	homozygous	c.524G>A	p.R175H	Detroit 562	<u>CCL-138</u> ™

Table 29: Prostate

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma	heterozygous	c.992A>G	p.Q331R	22Rv1	<u>CRL-2505</u> ™
metastasis, brain	Carcinoma	heterozygous	c.668C>T	p.P223L	DU 145	<u>HTB-81</u> ™
metastasis, brain	Carcinoma	heterozygous	c.820G>T	p.V274F	DU 145	<u>HTB-81</u> ™
metastasis, bone	Adenocarcinoma	homozygous	c.414delC	p.K139fs*31	PC-3	<u>CRL-1435</u> ™

Table 30: Rectum

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Adenocarcinoma	homozygous	c.742C>T	p.R248W	SW837	<u>CCL-235</u> ™
primary	Adenocarcinoma	homozygous	c.743G>A	p.R248Q	SW1463	<u>CCL-234</u> ™

Table 31: Retroperitoneal

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Primitive neuroectodermal, malignant	homozygous	c.527G>T	p.C176F	SK-PN-DW	<u>CRL-2139</u> ™

Table 32: Salivary Gland

Tumor source	Histology	Zygosity	Gene Sequence [†]	Protein Sequence [†]	Name	ATCC [®] No.
primary	Carcinoma, epidermoid	homozygous	c.539delA	p.E180fs*67	A-253	<u>HTB-41</u> ™

Table 33: Skin

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Melanoma, malignant	homozygous	c.434_435TG>GT	p.L145R	SK-MEL-28	<u>HTB-72</u> ™
primary	Melanoma	homozygous	c.578A>G	p.H193R	CHL-1	<u>CRL-9446</u> ™
primary	Carcinoma, epidermoid	homozygous	c.818G>A	p.R273H	A-431	<u>CRL-1555</u> ™
metastasis, lymph node	Melanoma, malignant	homozygous	c.497C>A	p.S166*	RPMI-7951	<u>HTB-66</u> ™
metastasis, lymph node	Melanoma, malignant	heterozygous	c.772G>A	p.E258K	MeWo	<u>HTB-65</u> ™
metastasis, lymph node	Melanoma, malignant	homozygous	c.799C>T	p.R267W	SK-MEL-3	<u>HTB-69</u> ™
metastasis, lymph node	Melanoma, malignant	homozygous	c.820G>T	p.V274F	A2058	<u>CRL-11147</u> ™
metastasis, lymph node	Melanoma, malignant	heterozygous	c.949C>T	p.Q317*	MeWo	<u>HTB-65</u> ™
metastasis, pleural effusion	Melanoma, amelanotic	heterozygous	c.797G>A	p.G266E	MDA-MB-435S	<u>HTB-129</u> ™
metastasis, skin	Melanoma, malignant	heterozygous	c.733G>A	p.G245S	SK-MEL-2	<u>HTB-68</u> ™

Table 34: Stomach

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
metastasis, ascites	Carcinoma	homozygous	c.614A>T	p.Y205F	SNU-16	<u>CRL-5974</u> ™
metastasis, ascites	Carcinoma	homozygous	c.783-2A>C	p.?	SNU-5	<u>CRL-5973</u> ™
metastasis, liver	Carcinoma	homozygous	c.743G>A	p.R248Q	NCI-N87	<u>CRL-5822</u> ™
metastasis, pleural effusion	Carcinoma	homozygous	c.1_1182del1182	p.0?	KATO III	<u>HTB-103</u> ™

Table 35: Testis

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Teratocarcinoma	homozygous	c.814delG	p.V272fs*73	NCCIT	<u>CRL-2073</u> ™

Table 36: Tongue

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, squamous cell	homozygous	c.451C>T	p.P151S	SCC-4	<u>CRL-1624</u> ™
primary	Carcinoma, squamous cell	homozygous	c.578A>T	p.H193L	CAL 27	<u>CRL-2095</u> ™
primary	Carcinoma, squamous cell	homozygous	c.625_626delAG	p.R209fs*6	SCC-25	<u>CRL-1628</u> ™
primary	Carcinoma, squamous cell	homozygous	c.672+1G>T	р.?	SCC-15	<u>CRL-1623</u> ™
primary	Carcinoma, squamous cell	homozygous	c.822_853del32	p.C275fs*20	SCC-9	<u>CRL-1629</u> ™

Table 37: Unknown

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
metastasis, lung	Histiocytoma, fibrous	heterozygous	c.741_742CC>TT	p.R248W	GCT	<u>TIB-223</u> ™
metastasis, lung	Histiocytoma, fibrous	heterozygous	c.948_949CC>TT	p.Q317*	GCT	<u>TIB-223</u> ™
metastasis, lymph node	Carcinoma, epidermoid	heterozygous	c.404G>T	p.C135F	A388	<u>CRL-7905</u> ™

Table 38: Urinary bladder

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma, transitional cell	homozygous	c.1045G>T	p.E349*	TCCSUP	<u>HTB-5</u> ™
primary	Carcinoma, transitional cell	homozygous	c.338T>G	p.F113C	UM-UC-3	<u>CRL-1749</u> ™
primary	Carcinoma, transitional cell	homozygous	c.378C>G	p.Y126*	T24	<u>HTB-4</u> ™
primary	Carcinoma	homozygous	c.749C>T	p.P250L	HT-1376	<u>CRL-1472</u> ™
primary	Carcinoma, transitional cell	heterozygous	c.783_919del137	p.?	J82	<u>HTB-1</u> ™
primary	Carcinoma	homozygous	c.839G>C	p.R280T	5637	<u>HTB-9</u> ™
primary	Carcinoma, transitional cell	homozygous	c.960G>C	p.K320N	J82	<u>HTB-1</u> ™

Table 39: Uterus

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Leiomyosarcoma	heterozygous	c.524G>A	p.R175H	SK-UT-1	<u>HTB-114</u> ™
primary	Leiomyosarcoma	heterozygous	c.743G>A	p.R248Q	SK-UT-1	<u>HTB-114</u> ™

Table 40: Uterus, endometrium

Tumor source	Histology	Zygosity	Gene Sequence ⁺	Protein Sequence ⁺	Name	ATCC [®] No.
primary	Carcinoma	heterozygous	c.216delC	p.V73fs*50	RL95-2	<u>CRL-1671</u> ™
primary	Adenocarcinoma	homozygous	c.524G>A	p.R175H	KLE	<u>CRL-1622</u> ™
primary	Carcinoma	heterozygous	c.652_654delGTG	p.V218del	RL95-2	<u>CRL-1671</u> ™
metastasis, lymph node	Adenocarcinoma	heterozygous	c.1165G>T	p.G389W	AN3 CA	<u>HTB-111</u> ™
metastasis, lymph node	Adenocarcinoma	heterozygous	c.267delC	p.S90fs*33	AN3 CA	<u>HTB-111</u> ™
metastasis, lymph node	Adenocarcinoma	heterozygous	c.638G>A	p.R213Q	AN3 CA	<u>HTB-111</u> ™

Table 41: Vulva

ATCC [®] No.	Designation	Tissue	Disease	TP53 status		
primary	Carcinoma, squamous cell	homozygous	c.473G>A	p.R158H	SW 954	<u>HTB-117</u> ™
primary	Leiomyosarcoma	heterozygous	c.733G>A	p.G245S	SK-LMS-1	<u>HTB-88</u> ™
metastasis, lymph node	Carcinoma	heterozygous	c.797G>T	p.G266V	SW 962	<u>HTB-118</u> ™

+For a description of the sequence variation nomenclature please refer to: den Dunnen JT and Antonarakes SE (2000), Hum. Mutat. 15:7-12.

The mutation data was obtained from the Sanger Institute Catalogue Of Somatic Mutations In Cancer web site, http://www.sanger.ac.uk/ cosmic Bamford et al (2004) The COSMIC (Catalogue of Somatic Mutations in Cancer) database and website. Br J Cancer, 91,355-358. ATCC and The Sanger Institute provide these data in good faith, but make no warranty, express or implied, nor assumes any legal liability or responsibility for any purpose for which the data are used.

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