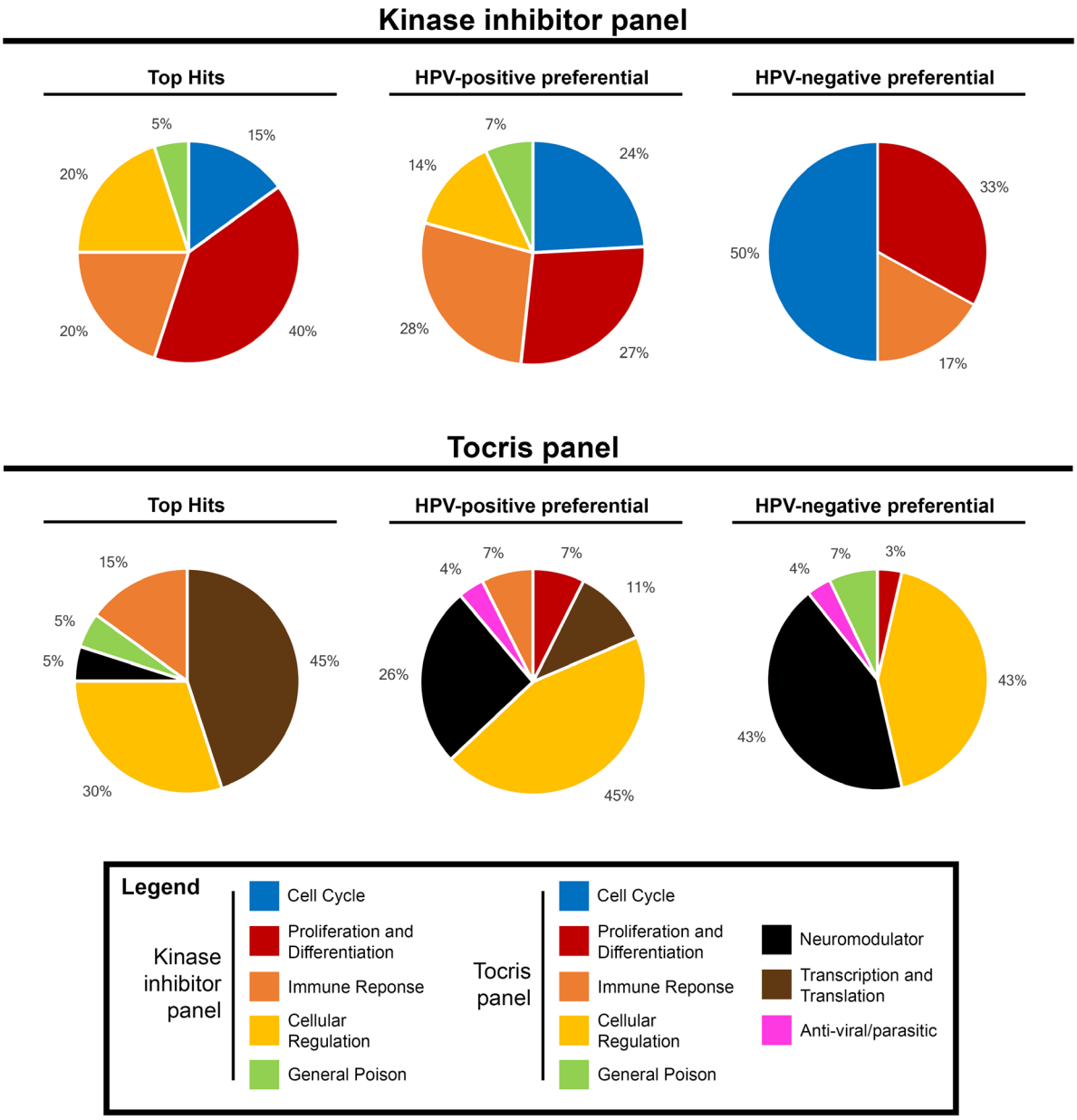
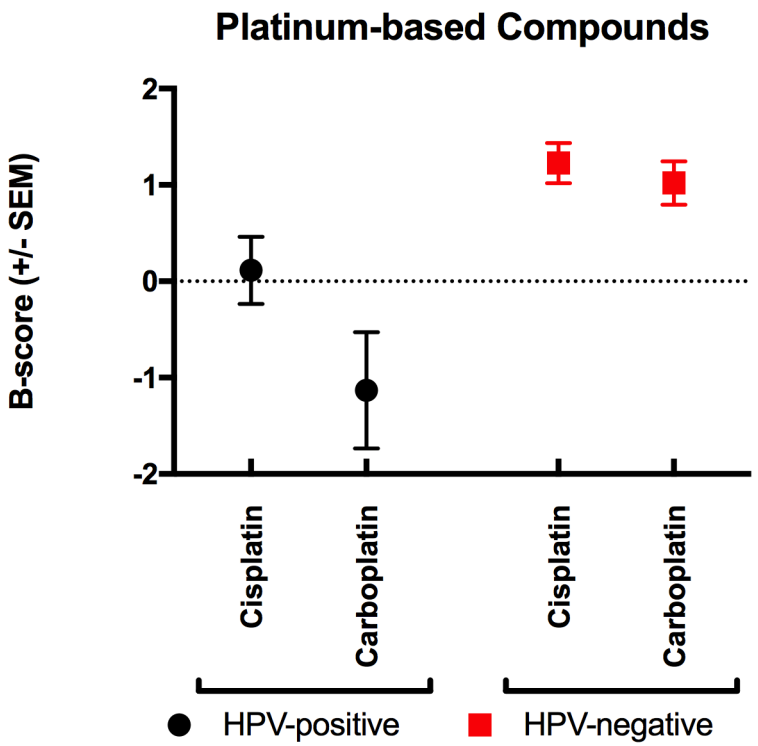
High-throughput testing in head and neck squamous cell carcinoma identifies agents with preferential activity in human papillomavirus-positive or negative cell lines

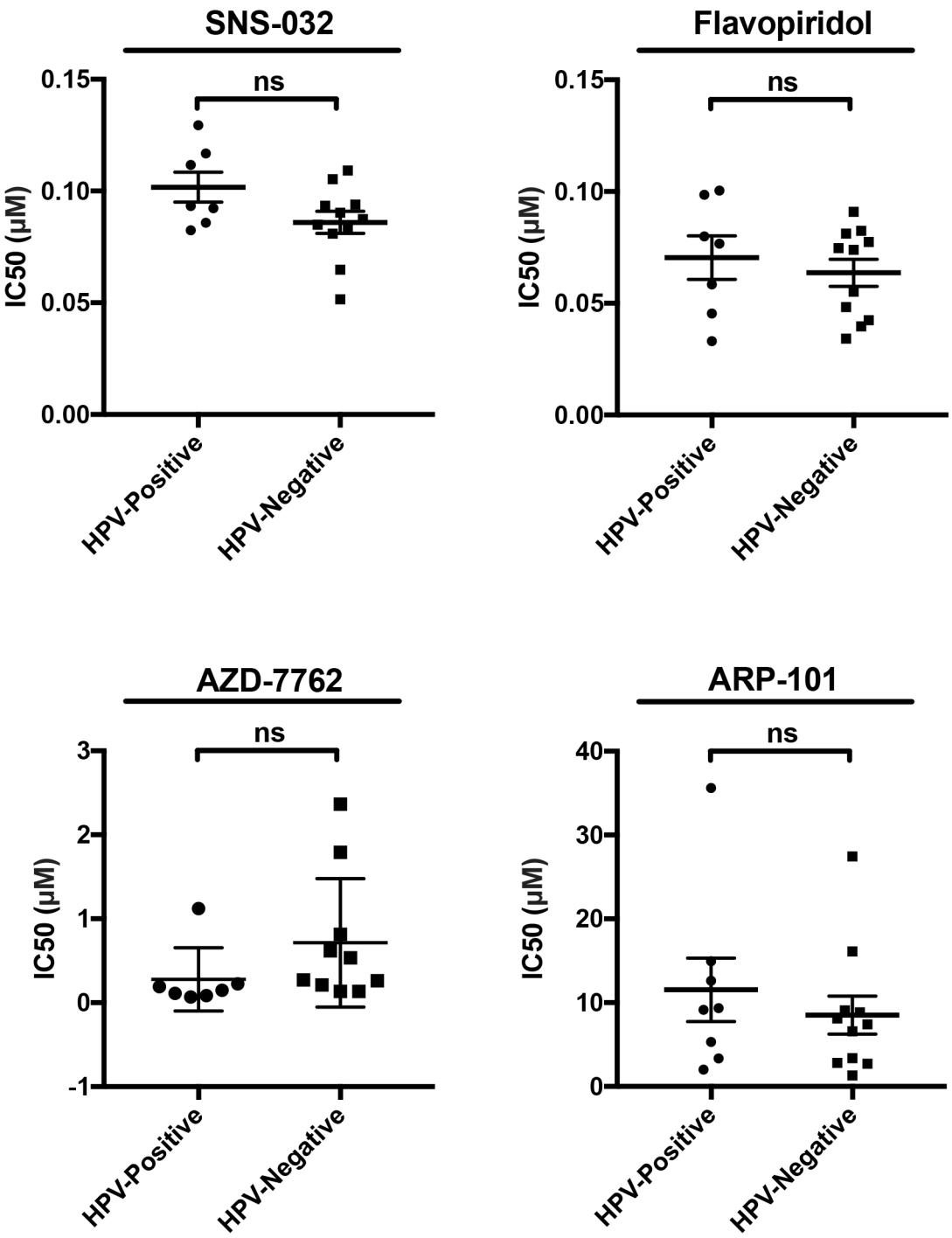
SUPPLEMENTARY MATERIALS



Supplementary Figure 1: Compounds identified as top hits in potency, preferential activity against HPV-positive and preferential activity against HPV-negative cell lines using the Kinase inhibitor and Tocris panels grouped by their mechanism of action.



Supplementary Figure 2: Cisplatin and carboplatin, chemotherapeutics in routine use head and neck cancer, were included in the compound panels, but did not meet the set criteria for significant activity (B-score < -2) at a dose of 4µM.



Supplementary Figure 3: Validation studies on SNS-032, Flavopiridol, AZD-7762 and ARP-101 did not reveal significantly selective potency against HNSCC cell lines stratified by HPV status (p=0.07, 0.54, 0.19 and 0.48 respectively). (ns = not significant).

Supplementary Table 1: Top 20 compounds with highest potency from the kinase inhibitor and tocris panels against HNSCC cell lines

Compound	All Cell lines		Primary mechanism of action	Category
	Mean	SEM		
Top 20 overall Hits from Kinase Inhibitor Panel				
Staurosporine	-4.66	0.46	Non-selective protein kinase inhibitor	General Poison
TCS 2312 dihydrochloride	-3.73	0.54	Potent Chk1 inhibitor	Cell Cycle
GDC-0941 bismesylate	-3.45	0.41	Inhibitor of class I PI3 kinase	Proliferation & Differentiation
IMD 0354	-3.36	0.33	Inhibitor of IKKβ	Immune Response
ER 27319 maleate	-3.11	0.31	Selective Syk kinase inhibitor	Immune Response
IC261	-3.08	0.35	Selective casein kinase 1δ and 1ε inhibitor	Cellular Regulation
Alsterpaullone	-3.04	0.51	Inhibitor of multiple CDKs	Cell Cycle
BI 78D3	-2.81	0.72	Competitive JNK inhibitor	Immune Response
Dasatanib	-2.72	0.56	Inhibitor of Abl, Src and c-Kit	Proliferation & Differentiation
NVP-BEZ235	-2.70	0.24	Inhibitor of PI3K and mTOR	Proliferation & Differentiation
PIK-75	-2.64	0.52	Inhibitor of p110α	Proliferation & Differentiation
A-443654	-2.63	0.39	Inhibitor of Akt	Proliferation & Differentiation
TAE-684	-2.48	0.51	Inhibitor of ALK	Proliferation & Differentiation
5-Iodotubercidin	-2.45	0.35	Potent adenosine kinase inhibitor	Cellular Regulation
FAK Inhibitor 14	-2.43	0.45	Selective FAK inhibitor	Proliferation & Differentiation
Ryuvidine	-2.40	0.58	Inhibitor of SETD8 and CDK4	Cellular Regulation
Lestaurtinib	-2.31	0.23	Inhibitor of JAK2, FLT3 and TrkA	Immune Response
NVP-AEW541, AEW541	-2.11	0.35	Inhibitor of IGF-1R/InsR	Cellular Regulation
SB-505124 hydrochloride hydrate	-2.06	0.67	Inhibitor of ALK5	Proliferation & Differentiation
NSC 663284	-2.05	0.43	Inhibitor of Cdc25 phosphatase	Cell Cycle
Top 20 Overall Hits from Tocris panel				
Pyrrolidinedithiocarbamate ammonium	-19.71	1.92	Inhibits NF-κB, prevents increase in NOS mRNA	Immune Response
Daunorubicin hydrochloride	-16.78	1.53	Inhibits topoisomerase II	Transcription and translation
Actinomycin D	-16.64	1.64	Inhibits RNA polymerase	Transcription and translation
SCS	-15.54	2.18	Selective GABAA receptor antagonist	Neuromodulators
NSC 146109 hydrochloride	-15.41	1.23	activates p53-dependent transcription	Transcription and translation
Doxorubicin hydrochloride	-14.70	1.88	Inhibits DNA topoisomerase II	Transcription and translation
Homoharringtonine	-14.62	1.26	Inhibitor of protein synthesis	Transcription and translation
A23187, free acid	-14.34	1.49	Calcium ionophore	General Poison
BNTX maleate	-14.31	1.20	Standard δ1 selective antagonist	Cellular regulation & physiology
MG 132	-13.67	1.32	Inhibitor of Proteasome, calpain and NF-κB activation	Immune Response
Brefeldin A	-13.61	1.21	Disrupts protein translocation to Golgi	Transcription and translation
Bay 11-7085	-13.32	1.38	Inhibitor of TNF-α-induced IκBα phosphorylation	Immune Response
Diphenyleneiodonium chloride	-13.21	1.15	GPR3 agonist; also inhibits NOS and NADPH oxidases	Cellular regulation & physiology
NSC 632839 hydrochloride	-13.11	1.11	Inhibitor of ubiquitin isopeptidase activity	Cellular regulation & physiology
SN 38	-12.50	1.17	Inhibitor of DNA topoisomerase I	Transcription and translation
Cycloheximide	-12.14	1.16	Inhibitor of protein synthesis	Transcription and translation
JTC 801	-12.00	1.10	Selective NOP antagonist	Cellular regulation & physiology
SCH 79797 dihydrochloride	-11.72	1.05	Selective casein kinase 1δ and 1ε inhibitor	Cellular regulation & physiology
Camptothecin	-11.61	1.25	DNA topoisomerase inhibitor	Transcription and translation
Cantharidin	-11.56	1.17	Inhibitor of Protein phosphatase 1/2A	Cellular regulation & physiology

Supplementary Table 2: Complete list of kinase inhibitor panel and Tocris panel compound activity against individual HNSCC cell lines

See Supplementary File 1

Supplementary Table 3: Compounds with preferential activity against HPV-positive cell lines

Compound	HPV-Positive		HPV-Negative		Difference		Primary mechanism of action	Category
	Mean B score	SEM	Mean B score	SEM	Mean B score	SEM		
Kinase inhibitor Panel								
SNS-032, BMS387032	-5.26	0.57	-0.10	0.64	-5.16	0.29	CDK 2 inhibitor	Cell Cycle
MK-1775	-4.90	0.42	-0.40	0.51	-4.50	0.25	Wee1 inhibitor	Cell Cycle
Flavopiridol	-3.94	0.49	-0.30	0.59	-3.64	0.27	CDK9 Kinase Inhibitor	Cell Cycle
AZ-960	-2.50	0.28	0.15	0.40	-2.65	0.18	JAK2 inhibitor	Immune Response
Merck-5, Mk-5	-2.90	0.29	-0.41	0.37	-2.49	0.17	JAK kinase family inhibitor	Immune Response
AZD-7762 hydrochloride	-3.29	0.35	-0.82	0.33	-2.47	0.15	Chk1/2 inhibitor	Cell Cycle
AT9283	-2.51	0.35	-0.12	0.40	-2.39	0.18	JAK2/3 inhibitor	Immune Response
BMS-3	-2.85	0.62	-0.56	0.53	-2.29	0.25	LIMK inhibitor	Cellular Regulation
KU0063794	-2.62	0.58	-0.46	0.39	-2.16	0.20	mTOR inhibitor	Proliferation & Differentiation
SKF 86002 dihydrochloride	-2.38	0.86	-0.33	0.25	-2.05	0.21	p38 MAP kinase inhibitor	Immune Response
RDEA-119, AR-119	-2.98	0.89	-1.16	0.30	-1.82	0.23	MEK1/2 inhibitor	Immune Response
GSK461364	-2.02	0.77	-0.24	0.27	-1.78	0.19	PLK1 inhibitor	Cell Cycle
GSK690693	-2.19	0.41	-0.53	0.21	-1.66	0.12	Akt 1/2/3 inhibitor	Proliferation & Differentiation
Foretinib	-2.28	0.79	-0.65	0.48	-1.63	0.26	HGF receptor family tyrosine kinase inhibtor	Proliferation & Differentiation
TWS119	-2.67	0.44	-1.14	0.42	-1.53	0.20	GSK-3β inhibitor	Cellular Regulation
PD 180970	-2.43	0.17	-0.96	0.46	-1.47	0.19	p210Bcr/Abl kinase inhibitor	Proliferation & Differentiation
BI 2536	-3.00	0.98	-1.56	0.20	-1.43	0.22	PLK1 inhibitor	Cell Cycle
SP-600125	-2.02	0.51	-0.64	0.37	-1.38	0.19	Selective JNK inhibitor	Immune Response
PI-103	-3.01	0.22	-1.73	0.34	-1.28	0.15	multi-targeted PI3K inhibitor for p110α/β/δ/γ	Proliferation & Differentiation
HDS 029	-2.38	0.37	-1.15	0.40	-1.23	0.18	ErbB receptor family inhibitor	Cellular Regulation
Akt 1/2 Kinase inhibitor	-2.73	0.28	-1.54	0.28	-1.19	0.13	Akt 1/2 Kinase Inhibitor	Proliferation & Differentiation
ZM 306416 hydrochloride	-2.17	0.42	-1.01	0.38	-1.15	0.18	VEGF receptor tyrosine kinase inhibitor	Proliferation & Differentiation
SB 218078	-2.77	0.35	-1.65	0.28	-1.12	0.14	Chk1 inhibitor	Cell Cycle
TCS JNK 5a	-2.74	0.30	-1.74	0.59	-1.00	0.25	JNK 2/3 inhibitor	Immune Response
Lestaurtinib	-3.03	0.40	-2.11	0.26	-0.92	0.14	JAK2, FLT3 and TrkA inhibitor	Immune Response
JNJ-10198409	-2.09	0.66	-1.22	0.59	-0.87	0.28	PDGF-RTK inhibitor	Proliferation & Differentiation
PKC-412	-2.50	0.30	-1.72	0.21	-0.78	0.11	Multi-targeted kinase inhibitor	General Poison
EKI-785, CL-387,785	-2.39	0.55	-1.63	0.46	-0.76	0.22	EGFR inhibitor	Cellular Regulation
K-252a	-2.58	0.47	-1.84	0.24	-0.74	0.15	Multi-targeted kinase inhibitor	General Poison
PIK 90	-2.40	0.35	-1.82	0.30	-0.58	0.15	PI3Kα/γ/δ inhibitor	Proliferation & Differentiation
Tocris Panel								
DIPPA hydrochloride	-5.52	2.63	0.49	0.50	-6.02	0.58	Selective irreversible κ antagonist	Neuromodulators
ARP 101	-5.59	2.10	-0.31	0.60	-5.28	0.50	Inhibitor of MMP-2	Cellular regulation & physiology
NNC 05-2090	-4.05	1.22	-0.02	0.46	-4.03	0.32	GABA uptake inhibitor	Neuromodulators
ICI-118,551	-3.58	1.30	0.33	0.30	-3.91	0.30	β2 antagonist/inverse agonist	Cellular regulation & physiology
JLK 6	-4.74	1.58	-0.85	0.40	-3.89	0.37	Inhibitor of γ-secretase-mediated βAPP processing	Cellular regulation & physiology
WAY 629 hydrochloride	-4.18	1.78	-0.43	0.58	-3.75	0.44	Selective 5-HT2C agonist	Neuromodulators
(S)-(-)-Propranolol hydrochloride	-3.18	1.05	0.47	0.21	-3.65	0.23	β antagonist	Cellular regulation & physiology
(-)-U-50488 hydrochloride	-3.60	3.26	-0.19	0.20	-3.41	0.68	Standard selective κ agonist	Neuromodulators
CGS 12066B dimaleate	-3.25	1.26	-0.29	0.25	-2.96	0.28	5-HT1B agonist	Cellular regulation & physiology
Amthamine dihydrobromide	-2.94	1.38	-0.39	0.29	-2.55	0.31	Highly selective standard H2 agonist	Immune Response
Evans Blue tetrasodium salt	-2.29	1.09	0.24	0.15	-2.53	0.23	inhibitor of L-glutamate uptake	Cellular regulation & physiology
Naltrindole hydrochloride	-2.86	1.32	-0.34	0.47	-2.52	0.34	Selective non-peptide δ antagonist	Cellular regulation & physiology
Physostigmine hemisulfate	-3.35	0.37	-0.84	0.35	-2.52	0.17	Cholinesterase inhibitor	Neuromodulators
Fenretinide	-2.22	1.19	0.15	0.58	-2.37	0.34	Synthetic retinoid and antiproliferative	Proliferation and differentiation
Cordycepin	-2.36	0.34	-0.18	0.26	-2.18	0.13	RNA synthesis inhibitor	Transcription and translation
PHTPP	-2.67	1.02	-1.01	0.58	-1.66	0.32	Selective ERβ antagonist	Cellular regulation & physiology
Deguelin	-2.02	1.09	-0.50	0.34	-1.52	0.27	Multi-target inhibitor including PI3K	Proliferation and differentiation
GF 109203X	-2.54	0.48	-1.10	0.49	-1.44	0.23	Protein kinase C inhibitor	Cellular regulation & physiology
Acyclovir	-2.03	0.72	-0.65	0.42	-1.38	0.23	Inhibits viral DNA polymerase	Anti-viral/parasitic
PNU 120596	-2.34	0.75	-1.05	0.27	-1.29	0.19	Positive allosteric modulator of α7 nAChR	Neuromodulators
N-Acetyl-N-acetoxy-4-chlorobenzenesulfonamide	-2.71	1.29	-1.54	0.49	-1.17	0.34	Inhibitor of aldehyde dehydrogenase	Cellular regulation & physiology
RITA	-2.40	1.67	-1.24	0.52	-1.16	0.41	MDM2-p53 interaction inhibitor	Transcription and translation
NNC 55-0396 dihydrochloride	-2.31	0.76	-1.18	0.70	-1.13	0.33	Inhibitor of T-type calcium channels	Neuromodulators
Caffeic acid phenethyl ester	-2.40	0.74	-1.39	0.45	-1.01	0.24	Specific inhibitor of NF-κB activation	Immune Response
CD 1530	-2.05	0.40	-1.17	0.64	-0.88	0.28	Potent and selective RARγ agonist	Transcription and translation
BMS 191011	-2.76	0.61	-1.89	0.42	-0.86	0.21	Potent BKCa channel opener	Cellular regulation & physiology
Ceramide	-2.21	0.58	-1.47	0.56	-0.74	0.26	Ser/Thr protein phosphatase activator	Cellular regulation & physiology

Supplementary Table 4: Compounds with preferential activity against HPV-negative cell lines

Compound	HPV-Positive		HPV-Negative		Difference		Primary mechanism of action	Category
	Mean B score	SEM	Mean B score	SEM	Mean B score	SEM		
Kinase inhibitor Panel								
Ryuvidine	-0.003	1.31	-3.08	0.58	3.08	0.36	SETD8 and CDK4 inhibitor	Cell Cycle
SB-505124 hydrochloride hydrate	-0.38	0.52	-2.54	0.82	2.16	0.36	ALK 4/5/7 inhibitor	Proliferation & Differentiation
FAK Inhibitor 14	-1.03	0.83	-2.87	0.50	1.84	0.28	FAK inhibitor	Proliferation & Differentiation
NSC 663284	-0.73	0.42	-2.43	0.52	1.69	0.23	CDC 25 phosphatase inhibitor	Cell Cycle
BI 78D3	-1.52	1.32	-3.18	0.84	1.66	0.44	JNK inhibitor	Immune Response
PHA 767491 hydrochloride	-1.35	0.51	-2.02	0.34	0.67	0.18	Cdc7/CDK9	Cell Cycle
Tocris Panel								
BTS 54-505	-1.66	1.90	-10.29	1.28	8.63	0.66	Potent serotonin and noradrenalin reuptake inhibitor	Neuromodulators
Paxilline	-0.73	1.85	-8.76	1.20	8.03	0.63	Potassium channel blocker; cellular toxin	General Poison
N-ArachidonylGABA	0.32	1.51	-6.17	1.32	6.49	0.63	Various cell signalling pathways	Neuromodulators
Roxindole hydrochloride	0.41	1.04	-5.27	1.15	5.68	0.52	Dopamine D2 autoreceptor agonist	Neuromodulators
N-Acetyltryptamine	-0.68	1.36	-6.33	1.00	5.65	0.50	Mixed agonist-antagonist at melatonin receptors	Neuromodulators
Y-26763	-1.68	0.38	-6.68	1.07	5.00	0.45	KATP channel openner	Cellular regulation & physiology
Scopolamine hydrobromide	1.69	0.65	-2.92	1.02	4.61	0.44	Muscarinic receptor antagonist	Neuromodulators
D-AP7	-1.79	0.62	-6.28	0.73	4.49	0.33	Specific NMDA antagonist	Cellular regulation & physiology
BADGE	0.94	0.52	-3.15	1.38	4.09	0.58	PPARγ antagonist	Cellular regulation & physiology
Tacrine hydrochloride	-0.74	0.48	-4.43	1.47	3.69	0.62	Cholinesterase inhibitor	Neuromodulators
SKF 96365 hydrochloride	-1.67	1.52	-5.19	0.91	3.52	0.49	TRPC channel blocker	Cellular regulation & physiology
Olvanil	-0.57	0.70	-3.47	0.37	2.90	0.21	Vanilloid receptor agonist	Cellular regulation & physiology
(R)-(+)-HA-966	-0.46	0.89	-3.31	0.51	2.85	0.28	NMDA partial agonist/ antagonist	Neuromodulators
(S)-SNAP 5114	0.63	0.76	-2.14	0.29	2.76	0.20	GABA uptake inhibitor	Neuromodulators
2-Methyl-5-hydroxytryptamine hydrochloride	-0.52	0.54	-3.02	0.53	2.51	0.25	5-HT3 agonist/potent 5-HT6 ligand	Neuromodulators
5,7-Dichlorokynurenic acid	-0.34	0.74	-2.84	0.40	2.50	0.23	Potent NMDA antagonist	Neuromodulators
Embelin	0.11	1.32	-2.37	0.68	2.48	0.39	Inhibitor of X-linked inhibitor of apoptosis (XIAP)	Cellular regulation & physiology
Ivermectin	-0.98	0.89	-3.25	0.82	2.27	0.39	Allosteric modulator of α7 nicotinic receptors	Anti-viral/parasitic
Tomoxetine hydrochloride	-0.22	0.35	-2.32	1.14	2.11	0.48	Selective noradrenalin re-uptake inhibitor	Neuromodulators
GR 127935 hydrochloride	-0.29	1.02	-2.38	0.75	2.09	0.38	5-HT1B/1D antagonist	Cellular regulation & physiology
Demethylasterriquinone B1	-0.15	0.53	-2.16	0.78	2.01	0.34	Selective insulin RTK activator	Cellular regulation & physiology
Tyrphostin B44, (+) enantiomer	-0.16	0.61	-2.16	0.47	2.00	0.23	EGFR-kinase inhibitor	Cellular regulation & physiology
PD 102807	-0.33	0.50	-2.29	0.37	1.97	0.18	Selective M4 antagonist	Neuromodulators
Ro 90-7501	-0.74	1.02	-2.69	1.21	1.95	0.54	Inhibitor of Aβ42 fibril formation	Cellular regulation & physiology
Aminopurvalanol A	-1.92	1.08	-3.66	0.48	1.74	0.30	Cyclin-dependent kinase inhibitor	Proliferation and differentiation
Gossypol	-0.62	1.16	-2.19	0.72	1.57	0.38	Proapoptotic; downregulates Bcl-2 and Bcl-XL	General Poison
PALDA	-0.91	0.92	-2.15	0.64	1.24	0.33	Endogenous lipid affecting TRPV1 receptors	Cellular regulation & physiology
OLDA	-1.97	0.45	-2.98	0.73	1.00	0.32	TRPV1 agonist	Cellular regulation & physiology

Supplementary Table 5: Source, HPV status and growth media of cell lines in the high-throughput study (HTS) and dose-response validation studies (DRVS)

Cell line	HPV status	Source	Study	Media
HMS-001	Positive	Rocco	HTS & DRVS	DMEM/F12
UM-SCC47	Positive	Carey	HTS & DRVS	DMEM/F12
93-VU-147T	Positive	deWinter	HTS & DRVS	DMEM/F12
UPCI:SCC090	Positive	Gollin	HTS & DRVS	DMEM/F12
UPCI:SCC154	Positive	Gollin	HTS & DRVS	DMEM/F12
UD-SCC2	Positive	Rocco	HTS & DRVS	DMEM/F12
UWO37	Positive	In House	DRVS	DMEM/F12
UWO23	Positive	In House	DRVS	DMEM/F12
SCC9	Negative	ATCC	HTS	DMEM/F12
FaDu	Negative	ATCC	HTS	DMEM/F12
Detroit 562	Negative	ATCC	HTS & DRVS	DMEM/F12
SCC15	Negative	ATCC	HTS & DRVS	DMEM/F12
SCC4	Negative	ATCC	HTS	DMEM/F12
SCC25	Negative	ATCC	HTS & DRVS	DMEM/F12
Cal 27	Negative	ATCC	HTS & DRVS	DMEM/F12
HSC2	Negative	JHSF	HTS & DRVS	DMEM/F12
JHU011	Negative	Rocco	HTS & DRVS	DMEM/F12
Cal33	Negative	DSMZ	HTS & DRVS	DMEM
JHU029	Negative	Rocco	HTS & DRVS	DMEM/F12
PCI 6B	Negative	Ferris	HTS & DRVS	DMEM/F12
PCI 13	Negative	Ferris	HTS	DMEM/F12
PCI 22B	Negative	Ferris	HTS	DMEM/F12
PCI 6A	Negative	Ferris	HTS	DMEM/F12
RF 15A	Negative	Ferris	HTS & DRVS	DMEM/F12
RF 15B	Negative	Ferris	HTS	DMEM/F12
RF 22A	Negative	Ferris	HTS	DMEM/F12
RF 37B	Negative	Ferris	HTS & DRVS	DMEM/F12
JHU 006	Negative	Rocco	HTS	DMEM/F12

Legend: **HPV** – human papillomavirus; **HTS** – High-throughput study; **DRVS** – Dose-response studies; **Rocco** - Dr. James Rocco, Harvard Medical School; **Carey** - Dr. Tom Carey, University of Michigan; **deWinter** - Dr. Johann deWinter, Free University of Amsterdam; **Gollin** - Dr. Suzanne Gollin, University of Pittsburgh Cancer Institute; **JHSF** - Japan Health Sciences Foundation; **DSMZ** - Deutsche Sammlung von Mikroorganismen und Zellkulturen; **Ferris** - Dr. Robert Ferris, University of Pittsburgh Cancer Institute; **In House;** Developed in our laboratory at Western University.

Supplementary Table 6: Short tandem repeat (STR) profiles of HNSCC cell line panel

Cell Line	Amelogenin	CSF1PO	D13S317	D16S539	D5S818	D7S820	TH01	TPOX	vWA	D18S51	D19S433	D21S11	D2S1338	D3S1358	D8S1179	FGA
93-VU-147T	X, Y	11, 11	8, 11	9, 12	11, 12	12, 12	6, 6	8, 8	17, 17	15, 20	12, 13	28, 29	21, 21	15, 15	12, 15	24, 24
UD-SCC2	X, Y	11, 12	8, 8	11, 13	10, 11	8, 9	8, 9	8, 10	18, 18	ND	ND	30, 31.2	ND	ND	ND	ND
HMS001	X, Y	11, 11	8, 8	9, 12	11, 12	12, 12	6, 6	8, 8	17, 17	15, 20	13, 14	28, 29	21, 21	15, 15	13, 15	24, 24
UM-SCC47	X, Y	11, 13	8, 11	8, 13	11, 12	11, 11	7, 9.3	10, 11	18, 18	18, 18	14, 15	29, 30	25, 25	15, 15	15, 15	25, 25
UPCI:SCC090	X, Y	11, 12	11, 11	12, 13	11, 12	9, 10	7, 7	8, 8	17, 17	14, 18	12, 13	39, 31	22, 22	14, 14	12, 12	20, 20
UPCI:SCC154	X, Y	10, 12	9, 12	13, 13	11, 12	9, 10	7, 7	8, 9	17, 17	15, 15	15.2, 16	28, 29	25, 25	16, 16	12, 12	20, 24
Cal27	X, X	10, 12	10, 11	11, 12	11, 12	10, 10	6, 9.3	8, 8	14, 17	13, 13	14, 15.2	28, 29	23, 24	16, 16	13, 15	25, 25
Detroit 562	X, X	11, 13	12, 12	11, 11	11, 12	8, 10	8, 9	8, 10	16, 16	15, 15	14, 14	28, 30	25, 25	15, 16	13, 13	21, 21
FaDu	----	12, 12	8, 9	11, 11	12, 12	11, 12	8, 8	11, 11	15, 17, 18	16, 16	14, 16	31.2, 31.2	19, 19	17, 18	13, 13	25, 25
SCC-4	X, Y	11, 11	11, 13	12, 12	13, 13	9, 11	9.3	8, 8	15, 17	15, 15	12, 14	32.2, 32.2	16, 24	18, 18	14, 14	21, 22
SCC-9	X, Y	11, 11	9, 9	10, 11	12, 12	8, 8	8, 9	9, 11	17, 17	12, 14	12, 14	28, 28	19, 21	15, 15	13, 13	20, 25
SCC-15	X, Y	10, 13	9, 14	12, 15	12, 12	10, 11	9, 9.3	8, 8	15, 17	16, 16	12, 15	30, 30	16, 23	16, 16	10, 13	24, 24
SCC-25	X, X	10, 10	13, 13	11, 12	12, 12	12, 12	8, 8	8, 12	17, 19	16, 16	13, 14	30, 30	17, 19	17, 17	13, 13	20, 24
Cal33	X, Y	11, 12	8, 13	11, 11	11, 12	8, 10	9, 9.3	8, 8	17, 17	14, 14	14, 15.2	29, 30	20, 25	17, 17	13, 13	21, 22
HSC2	X, Y	12, 13	11, 12	12, 12	10, 12	9, 12	6, 7	8, 8	16, 18	ND	ND	31.2, 31.2	ND	ND	ND	ND
JHU006	X, Y	10, 10	11, 11	12, 12	12, 12	9, 10	6, 6	8, 8	14, 16	16, 16	14, 14.2	31, 31	17, 25	13, 13	13, 14	19, 19
JHU011	X, X	10, 12	12, 12	9, 14	9, 12	11, 11	6, 9	8, 9	16, 17	13, 15	13, 14	31, 31	17, 26	18, 18	13, 13	23, 23
JHU029	X, Y	8, 12	12, 13	10, 13	13, 15	10, 11	8, 8	9, 11	15, 15	15, 15	13, 13	33.2, 33.2	19, 26	16, 16	14, 14	22, 25
PCI6A	X, X	12, 12	9, 11	11, 11	11, 12	8, 12	6, 6	11, 11	15, 18	12, 17	15, 16.2	31.2, 31.2	17, 24	18, 18	14, 14	23, 23
PCI6B	X, Y	10, 11	10, 11	12, 13	12, 12	12, 13	6, 7	8, 9	16, 18	16, 16	12, 14	32.2, 32.2	23, 24	18, 18	13, 14	20, 20
PCI13	X, X	10, 14	10, 11	11, 11	11, 14	11, 12	9, 9.3	6, 8	13, 17	16, 16	13, 15.2	29, 30	24, 24	14, 14	12, 13	22, 22
PCI30	X, Y	10, 10	13, 13	12, 13	11, 11	10, 12	6, 6	10, 11	14, 17	12, 15	12, 12	30, 32.2	18, 18	15, 15	13, 15	21, 21
RF15A	X, X	10, 12	12, 12	9, 9	10, 12	10, 11	6, 6	8, 11	17, 17	16, 18	13, 14	29, 29	20, 23	16, 16	14, 14	22, 22
RF15B	X, Y	11, 11	11, 11	11, 11	11, 11	11, 11	6, 6	8, 8	18, 18	14, 14	14, 15.2	28, 28	20, 25	16, 16	14, 14	23, 23
RF22A	X, X	10, 10	8, 12	9, 11	12, 12	8, 9	6, 6	8, 11	15, 18	18, 18	14, 15	28, 28	17, 20	16, 16	11, 13	22, 24
RF22B	X, X	10, 12	8, 11, 12	9, 12, 13	10, 12, 13	9-12	6, 6	8, 11	15-18	16, 18	12, 13, 14	27, 29	20, 22, 23	16, 18	13-16	18, 22
RF37A	X, X	11, 11	10, 13, 14	11, 14	11, 11	7, 10	7, 9.3	8, 11	16, 17	13, 13	15, 16	30, 32.2	24, 24	17, 17	11, 13	21, 21
RF37B	X, X	10, 12	12, 12	9, 9	10, 12	10, 11	6, 6	8, 11	17, 17	16, 18	13, 14	29, 29	20, 23	16, 16	14, 14	22, 22
SCC61	X, Y	10, 12	10, 12	9, 11	12, 13	8, 12	7, 9	8, 8	16, 17	ND	ND	28, 30	ND	ND	ND	ND
BICR56	X, X	12, 12	12, 12	11, 11	11, 12	8, 12	9, 9.3	8, 9	15, 16	14, 17	14, 15	28, 29	24, 26	14, 14	11, 13	21, 21
PE/CA-PJ49	X, X	11, 12	8, 11	11, 11	8, 12	8, 9	6, 10	8, 8	16, 19	24, 24	14, 14	32, 32	17, 18	16, 16	10, 11	20, 20

ND: not determined.