

Title Page

Title: Systematic Analysis of Gene Alterations and Clinical Outcome of Cyclin-Dependent Kinase 5 in Lung Cancer

Authors' names: Jie Zeng^{1#}, Shuanshuan Xie^{1#}, Yang Liu¹, Changxing Shen¹, Xiaolian Song¹, Guo-Lei Zhou^{2,3}, Changhui Wang^{1*}

Authors' affiliations:

¹Department of Respiratory Medicine, Shanghai Tenth People's Hospital, Tongji University, Shanghai 200072, PR China;

²Department of Biological Sciences, Arkansas State University, State University, AR 72467, USA;

³Molecular Biosciences Program, Arkansas State University, State University, AR 72467, USA.

These authors have contributed equally to this work.

Correspondence to: Changhui Wang, No.301, Mid Yanchang Rd, Department of Respiratory Medicine, Shanghai Tenth People's Hospital, Tongji University, Shanghai, China, 200072.

Email: wang-chang-hui@hotmail.com

Fax number: 86-021-66301685, Telephone: 86-021-66301685

Supplementary Table 1: CDK5 expression in cancers

Cancer	Cancer subtype	P-value	Fold change	Rank (10%)	Sample	Reference
Bladder	Superficial bladder	1.85E-18	7.511	10	76	[55]
	Infiltrating bladder	2.56E-7	2.718	10	129	[55]
Brain and CNS	Anaplastic Oligoastrocytoma	4.78E-5	-3.614	10	10	[56]
	Glioblastoma	5.63E-6	-3.247	10	31	[56]
	Astrocytoma	9.31E-5	-2.186	10	51	[57]
	Anaplastic Astrocytoma	7.87E-8	-2.627	10	42	[58]
	Oligodendroglioma	1.28E-9	-2.869	10	73	[58]
Breast	Invasive Ductal and Invasive Lobular Breast Carcinoma	9.17E-49	2.108	10	234	[59]
	Breast Carcinoma	1.22E-10	2.023	10	158	[59]
	Mucinous Breast Carcinoma	1.66E-25	2.246	10	190	[59]
	Tubular Breast Carcinoma	1.27E-35	2.007	10	214	[59]
	Medullary Breast Carcinoma	1.30E-35	2.107	10	176	[59]
	Invasive Ductal Breast Carcinoma	1.73E-102	2.156	10	1700	[59]
	Lobular Breast Carcinoma	3.03E-10	2.449	10	22	[60]
	Invasive Ductal Breast Carcinoma	2.37E-11	2.435	10	37	[60]
	Invasive Breast Carcinoma	1.70E-9	2.094	10	158	[61]

	Invasive Ductal Breast Carcinoma	1.85E-40	2.166	10	450	[62]
Colorectal	Rectal Adenocarcinoma	5.39E-34	2.451	10	130	[63]
	Colon Adenoma	1.54E-10	2.059	10	57	[64]
Head and Neck	Tongue Squamous Cell Carcinoma	2.36E-14	4.819	10	57	[65]
Leukemia	Hairy Cell Leukemia	7.07E-10	-3.125	10	41	[66]
Liver	Hepatocellular Carcinoma	3.54E-20	-2.418	10	179	[67]
Lymphoma	Diffuse Large B-cell Lymphoma	3.44E-6	2.666	10	57	[66]
	Centroblastic Lymphoma	2.49E-8	3.170	10	53	[66]
	Anaplastic Large Cell Lymphoma	1.36E-5	3.920	10	26	[68]
	Angioimmunoblastic T-cell Lymphoma	5.12E-5	2.196	10	26	[68]
Melanoma	Cutaneous Melanoma	4.05E-5	21.456	10	52	[69]
Ovarian	Ovarian Serous Adenocarcinoma	2.16E-5	2.040	10	53	[70]
Other	Seminoma, NOS	4.91E-8	2.318	10	18	[71]
	Yolk Sac tumor, NOS	9.49E-6	2.306	10	15	[71]
	Uterine Corpus Leiomyoma	7.97E-5	2.498	10	77	[72]

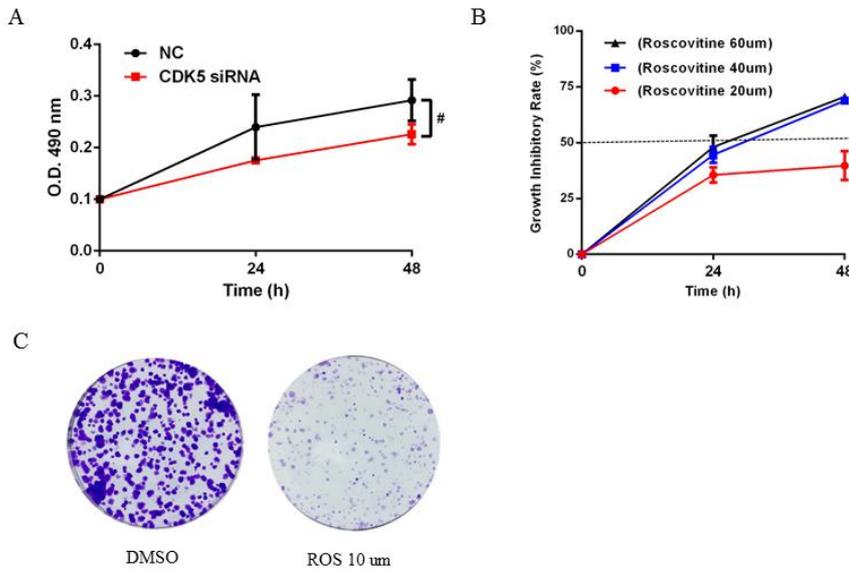
Supplementary Table 2

Dataset	GSE19234	E-TABM-346	jacob-00182-MSK	GSE31210
Cancer type	Skin cancer	Blood cancer	Lung cancer	Lung cancer
Subtype	Melanoma	DLBCL	Adenocarcinoma	Adenocarcinoma
Number	38	53	104	204
Endpoint	Overall survival	Overall survival	Overall survival	Overall survival
Event 0	19	23	65	174
Event 1	19	30	39	30
Female	14	26	67	109
Male	24	27	37	95
	Stage III A: 4	Grade 2: 10	Score N 1: 64	Stage IA: 109
	Stage III B: 18	Grade 3: 26	Score N 2: 20	Stage IB: 53
	Stage III A: 11	Grade 4: 9	Score N 3: 20	Stage II: 42
	Stage IV: 5	Grade 5: 8	Score T 1: 33	ALK-Fusion: 7
			Score T 2: 67	EGFR-Mutation: 116
			Score T 3: 4	EGFR/KRAS/ALK-:62
				KRAS Mutation: 19
				MYC High: 16
				MYC Low: 187
				MYC ND: 1
				Ever-Smoker: 99
				Never-Smoker: 105

Supplementary Figure 1. CDK5 promoted the proliferation ability of lung cancer cells in vitro. (A) MTT experiment was performed in PC9 cells transfected with NC siRNA or CDK5 siRNA. Error bars represent the mean \pm s.d. of three independent experiments. (B) The growth inhibitory rate of PC9 after treated with roscovitine at the concentration for 20um, 40um, 60um. Error bars represent the mean \pm s.d. of three independent experiments. (D) Colony-formation assay was used for detecting the proliferation ability in PC9 cells after treated with roscovitine. (# p<0.05; * p<0.01; ** p<0.001).

Supplementary Figure 2. CDK5 promoted lung cancer cell migration in vitro. (A) Transwell assay was performed in PC9 cells transfected with NC siRNA and CDK5 siRNA. NC: Normal control, S1: siRNA1, S2: siRNA2. (B) Wound healing assay was performed in PC9 cells after treated with roscovitine at the concentration of 20um or 40um. Error bars represent the mean \pm s.d. of three independent experiments. (# $p < 0.05$; * $p < 0.01$; ** $p < 0.001$).

Supplementary Figure 1



Supplementary Figure 2

