Supplemental Digital Content, containing 2 tables. The Supplemental Digital Content was not

Supplementary Table 1: Summary of clinicopathological, immunohistochemical and molecular genet

Lead author [Reference No.]	**Loarer et al. 2015 [1]**			
Case S.No.	L1	L2	L2	L4
Age in years	47	43	62	34
Sex (M-male; F - female)	F	M	M	M
Smoker Yes/No/NA	NA	NA	NA	NA
Stage	IV (T1N2M1)	IV (T2N1M1)	IIIB (pT4N2M0)	IIIA (pT3N2M0)
Specimen	Mediastinal LN	NA	NA	NA
Histology	LCC	ADCA solid	ADCA solid	LCC
BRG1	Lost	Lost	Lost	Lost
BRM	Retained	Retained	Lost	Retained
p53	NA	NA	NA	NA
Pan-CK	NA	NA	NA	NA
CK-7	Negative	Positive (f)	Negative	Negative
CK-20	NA	NA	NA	NA
CK5/6	Negative	Negative	Negative	Negative
EMA	NA	NA	NA	NA
TTF-1	Negative	Negative	Positive (f)	Negative
Napsin	NA	NA	NA	NA
p40	Negative	Negative	Negative	Negative
p63	Negative	Negative	Positive (f)	Positive (f)
SALL4	NA	NA	NA	NA
Hepar-1	NA	NA	NA	NA
CD34	NA	NA	NA	NA
SOX2	Negative	Negative	Negative	Negative
CD56/CG/SYN	NA	NA	NA	NA
Claudin 4	NA	NA	NA	NA

SMARCA4 mutations	exon 30 nonsense	exon 25 splice	exon 6 nonsense	exon 16 frameshift
SMARCA4 LOH	Yes	NA	Yes	Yes
EGFR mutations	wild type	wild type	wild type	wild type
ALK/ROS1 fusions	Negative	Negative	Negative	Negative
KRAS mutations	wild type	mutant	wild type	wild type
TP53 mutations	mutant	mutant	mutant	mutant
STK11 mutations	wild type	wild type	wild type	wild type
CDKN2A mutations	wild type	wild type	wild type	mutant
Other	None	SETD2 mutation	ERBB2 mutation	None
Treatment	NA	NA	NA	NA
Outcome	DOD 9 months	DOD 6 months	DOD 19 months	A 44 months

Footnotes:

Abbreviations: N/A- not available; TNM- tumor node metastasis; LN- lymph node; Bx- Biopsy; CK- cytokeratin; BRG1- Brahma related gene SWI/SNF-related, matrix-associated, actin-dependent regulator of chromatin, subfamily A, member 2; EGFR- Epidermal growth factor rec HRAS- HRas Proto-Oncogene, GTPase; PTCH1- Protein patched homolog 1; SMO- Smoothened, Frizzled Class Receptor; PPARG- Peroxison

References:

1. Loarer F, Watson S, Pierron G, et al. SMARCA4 inactivation defines a group of undifferentiated thoracic malignancies transcriptionally r
2. Agaimy A, Fuchs F, Moskalev EA, Sirbu H, Hartmann A, Haller F. SMARCA4-deficient pulmonary adenocarcinoma: clinicopathological, im
3. Naito T, Umemura S, Nakamura H, et al. Successful treatment with nivolumab for SMARCA4-deficient non-small cell lung carcinoma wi
4. Yoshida A, Kobayashi E, Kubo T, et al. Clinicopathological and molecular characterization of SMARCA4-deficient thoracic sarcomas with
5. Matsubara D, Kishaba Y, Ishikawa S, et al. Lung cancer with loss of BRG1/BRM, shows epithelial mesenchymal transition phenotype anc
6. Oike T, Ogiwara H, Tominaga Y, et al. A synthetic lethality-based strategy to treat cancers harboring a genetic deficiency in the chromat

:ic features of lung carcinomas showing loss of SMARCA4/BRG1 protein expression

Agaimy et al. 2017 [2]

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
67	63	55	57	61	41	66	60	65	56
F	M	M	M	F	M	F	M	M	M
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IV (cT2bcN3cM1b)	IV (pT1bpN3pM1a)	IV (TxNxM1)	IV (cT4NxM1)	IIB (pT1apN1cM0)	IIB (pT3pN0cM0)	IV (cTxcN3cM1b)	IV (cT2acN3cM1b)	IV (cT2acN2cM1a)	NA
Cryobiopsy	Wedge resection	Abdominal wall mass excision	Liver Bx	Wedge resection	Lobectomy	EBUS TBNA	Core biopsy	Core biopsy	TBLB
Rhabdoid	ADCA solid with clear cells	Rhabdoid	ADCA solid	ADCA solid with clear cells	ADCA solid with spindling	ADCA solid	ADCA solid	ADCA solid	Rhabdoid
Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost
Retained	Retained	Lost	Lost	Lost	Reduced	Reduced	Lost	Reduced	Lost
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Positive	Positive	Negative	Positive	Positive	Positive	Positive	Positive	Positive (i)	Negative
Negative	Negative	NA	NA	NA	Negative	NA	Negative	NA	NA
Negative	NA	Negative	NA	Negative	NA	NA	NA	NA	Negative
NA	NA	NA	NA	NA	NA	NA	NA	NA	Positive
Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
NA	Negative	Negative	Negative	Negative	Negative	NA	Negative	NA	NA
NA	NA	Negative	NA	Negative	Negative	Negative	Negative	NA	NA
Negative	NA	NA	NA	Negative	NA	NA	NA	NA	NA
Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Positive (i)	Negative
Positive	Negative	Negative	Positive	Positive	Positive (i)	Positive	Positive	Positive	Positive
NA	NA	NA	NA	NA	NA	NA	NA	NA	Negative
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Negative	Negative	Negattive	Negative	NA	Negative	Negative	Negative	NA	SYN Positive
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

9/12 mutations (truncating mutations in 7, inframe deletions in 2)

5/9 *SMARCA4* mutant tumors showed LOH

17 tested were wild type
Negative (*ALK* fusions tested in 9; *ROS* fusions tested in 6)
1/12 *KRAS* mutant (in a *SMARCA4* wild type tumor)
10/12 *TP53* mutant (9 were also *SMARCA4* mutant; 1 was *SMARCA4* wild type)
3/12 *STK11* mutant (2 also *SMARCA4* mutant; 1 *SMARCA4* wild type)
NA

FGFR3 mutations, *ERBB2* amplification, *GNAS* mutation, *CTNNB1* mutations in *SMARCA4* mutant cases; *MYC* amplification, *DDR2* mu

RT/CT	RT/CT	Palliative	Palliative	Resection with adjuvant CT	Resection with LND	CT	Palliative	CT	NA
DOD 1 month	A 28 months	LFU	LFU	AWR 12 months	LFU	DOD 1.6 months	DOD 4.4 months	A 5.5 months	NA

e-1; BRM- Brahma; ADCA- adenocarcinoma; SQCC- squamous cell carcinoma; LCC- large cell carcinoma; PDCA- poorly differentiated car
eptor; ALK- Anaplastic lymphoma kinase; ROS- Ros protooncogene-1; KRAS- Ki-ras2 Kirsten rat sarcoma viral oncogene homolog; STK11
ne proliferator-activated receptor gamma; NOTCH1- Notch homolog 1, translocation-associated; CCND1- Cyclin D1; RT radiotherapy; CT

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th a high tumor mutation burden: A case report. Thorac Cancer. 2019;10:1285-1288.
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d distinct histologic and genetic features. Cancer Sci. 2013;104:266-73.
tin remodeling factor BRG1. Cancer Res. 2013;73:5508-18.

A11	A12	A13	A14	A15	A16	A17	A18	A19	A20
53	66	58	76	50	59	72	48	53	73
M	F	F	F	M	F	M	F	M	M
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IIIC (cT4cN3cM0)	IIIC (cT4cN3cM0)	IV (TxNxM1)	NA (cT4cN3Mx)	IV (cT3cN3cM1b)	IV (cT2cN2pM1b)	NA (pT1apN0cMx)	IV (cT4cN3cM1b)	IV (apT4N3M1)	IV (TxNxM1)
Core biopsy	Core biopsy	Brain biopsy	EBUS-TBNA	Core biopsy	Core Bx	Partial lobectomy	EBUS TBNA	autopsy	Cervical LN
Mucinous	ADCA solid, acinar, papillary	ADCA solid with clear cells	ADCA solid with rhabdoid	ADCA solid	ADCA solid	ADCA solid with clear cells	Mucinous, signet cells, rhabdoid	ADCA solid with clear cells	ADCA solid with clear cells
Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost	Lost
Retained	NA	Reduced	Lost	Reduced	Retained	Reduced	Reduced	NA	Reduced
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
NA	NA	Negative	NA	NA	NA	NA	NA	Negative	NA
NA	NA	Negative	NA	NA	NA	NA	NA	Negative	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Negative	Positive (w)	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative
NA	NA	Negative	NA	Positive	NA	NA	NA	NA	Negative
Negative	NA	NA	NA	Negative	Negative	Positive (f)	Negative	NA	Negative
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Negative	Negative	Positive	Negative	Negative	Negative	Positive (f)	Negative	Negative	Negative
Positive	Positive	Positive (i)	Positive	Negative	Positive	Negative	Positive	Positive	Positive
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Negative	Negative	NA	NA	Negative	Negative	SYN positive	Negative	Negative	Negative
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

utation, *HRAS* amplification in *SMARCA4* wild type cases

RT/CT	NA	Palliative	None	NA	RT/CT	Partial lobecomty and LND	CT/RT	Palliative	Palliative CT
A 9 months	NA	NA	Died immediately	NA	A 2.6 months	NA	DOD 2.3 months	Died immediately	NA

cinoma; f- focal; i- isolated cells postive, w- weak; d- diffuse; EMA- epithelial membrane antigen; SALL4- Sal-like protein 4; HepPar-1- He
- Serine/threonine kinase 11; CDKN2A- cyclin-dependent kinase Inhibitor 2A; SETD2-SET domain containing 2; ERBB2-Receptor tyrosine
T chemotherapy; DOD died of disease; AWR Alive with residual disease; A alive, LFU lost to follow up; LND lymph node dissection

;) immunophenotype. Virchows Arch. 2017;471:599-609.

Current study				**Naito et al. 2019 [3]**	**Yoshida et al. 2017 [4]**
AN1	AN2	AN3	AN4	N1	n=12
67	58	81	41	43	median 55.5 (range 44-69)
M	M	M	M	M	M (11); F (1)
Yes	Yes	NA	NA	Yes (SI 460)	11/12 smokers
II (pT2pNocM0)	NA (cT2 Nx Mx)	IV (TxNxpM1)	IV (cT2 Nx pM1)	IIIA (pT4N0M0)	NA
Lobectomy	Endobronchial mass	Right cervical LN	Cervical LN	Left upper lobectomy	NA
ADCA solid with clear cells	LCC	PDCA	PDCA	ADCA, solid and acinar	All ADCA (solid predominant (7), acniar predominant (4), solid and acinar (1); 4 cases showed abrupt dedifferentiation and SMARCA4 loss only in
Lost	Lost	Lost	Lost	Lost	Lost (8/12), Hybrid loss (4/12)
Reduced	Partial loss	Lost	Lost	Partial loss	Lost (1/12)
Negative	Null	Positive	Positive	NA	NA
Positive	Positive	Positive (i)	NA	NA	Positive (12/12)
Positive	Positive	Positive (i)	Positive(i)	NA	NA
Negative	Negative	Negative	Negative	NA	NA
NA	NA	NA	NA	NA	NA
Positive	Positive	NA	NA	NA	NA
Negative	Negative	Negative	Positive (f)	Negative	Positive (f) (6/12)
NA	NA	NA	NA	NA	NA
Negative	Negative	Positive (i)	Negatve	NA	NA
NA	NA	NA	NA	NA	NA
Negative	Negative	Positive (d,w)	Positive (d,w)	NA	Negative (12/12)
Positive (i)	Negative	Positive (f)	Negative	NA	NA
Negative	Negative	Negative	Negative	NA	Negative (12/12)
Negative	Negative	Negative	Negative	NA	Positive (1/12), positive (f) in 3/12
Negative	Positive CG (i)	Negative	Negative	NA	NA
NA	NA	NA	NA	NA	Positive (12/12)

NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
wild type	wild type	wild type	wild type	wild type	NA
Negative	Negative	Negative	Negative	Negative	NA
NA	NA	NA	NA	wild type	NA
NA	NA	NA	NA	mutant	NA
NA	NA	NA	NA	wild type	NA
NA	NA	NA	NA	mutant	NA
NA	NA	NA	NA	*PTCH1* mutations, *SMO* mutation, *PPARG* mutation, *NOTCH1*	NA
Lobectomy with LND	NA	NA	NA	Resection with LND	NA
A 12 months	NA	NA	Died immediately	Multiple lung metastases in 2 months; No response to two lines of CT, progressed with	NA

epatocyte Paraffin-1; SOX2- SRY Box-2; CG- chromogranin, SYN- synaptophysin; CD56- Cluster of differentiation 56;
-protein kinase erbB-2; FGFR3- Fibroblast growth factor receptor 3 GNAS- guanine nucleotide binding protein, alph

Matsubara et al. 2013 [5] n=11	Oike et al. 2013 [6] n=16	ALL CASES n=68	No. of cases with data avaiable for analysis
NA	11/16 <67 years	58	n=29
NA	M (16); F (0)	4.7:1	n=57
5/6 heavy smokers (SI >600)	Yes (15/16)	34/37	n=37
I (7/11); II/III/IV (4/11)	II (8/16); I (5/16); IV (3/16)	I (12), II (11), III (5), IV (20)	n=48
Resections	NA		
ADCA solid (6/11), ADCA papillary (3/11), mucinous (1/11), ADCA acinar (1/11)	ADCA (8/16), SQCC (8/16)	ADCA (52), LCC (3), PDCA (2), Rhabdoid (3), Squamous (8)	n=68
Lost (11/11)	Lost	Loss (64), Hybrid loss (4)	n=68
Lost (5/11)	Lost (6/16)	Loss (21), Partial loss (2), Hybrid loss (0), Reduced (9), Retained (34)	n=66
NA	NA		n=4
NA	NA		
Positive (4/11)	NA	Positive (23), f(1), i (3)	n=39
NA	NA		
NA	NA	Negative (10)	n=10
NA	NA		
Negative (11/11)	NA	Positive (1), f (8), w (1)	n=52
NA	NA	Positive (2)	n=9
NA	NA	Positive f (1), i(1)	n=19
NA	NA	Positive f(2)	n=6
NA	NA	Positive (1), f (1), i (1), w (2)	n=36
NA	NA	Positive (14), f (1), i (3)	n=24
NA	NA	All negative	n=17
NA	NA	Positive (1), f(3)	n=19
NA	NA	Positive (2)	n=19
NA	NA	All positive	n=12

NA	NA	13/16	n=16
NA	NA	8/12	n=12 *SMARCA4* mutant tumors
wild type (11/11)	NA	All wild type	n=36
NA	NA	All negative	n=17
mutant (2/11)	NA	4/28	n=28
NA	NA	15/17	n=17
NA	NA	3/17	n=17
NA	NA	2/5	n=5
NA	NA	FGFR3 mutations, ERBB2 amplification/mutation, GNAS mutation, CTNNB1	n=17
NA	NA		
NA	NA	Overall median survival 9 months: Stage IV - 4.4 months; Stage III - 31.5 months; Stage II - undefined	n=17

: SMARCA4- SWI/SNF-related, matrix-associated, actin-dependent regulator of chromatin, subfamily A, member 4; SMARCA2-
a stimulating; CTNNB1- Catenin beta-1; MYC- MYC Proto-Oncogene; DDR2- Discoidin Domain Receptor Tyrosine Kinase 2;

ONLY ADCA: Solid (25/52), solid with clear cell (7/52), solid with rhabdoid cells (1/52), acinar/papillary (8/52), mucinous (2/52), mucinous with signet cells (1/52), subtype not mentioned