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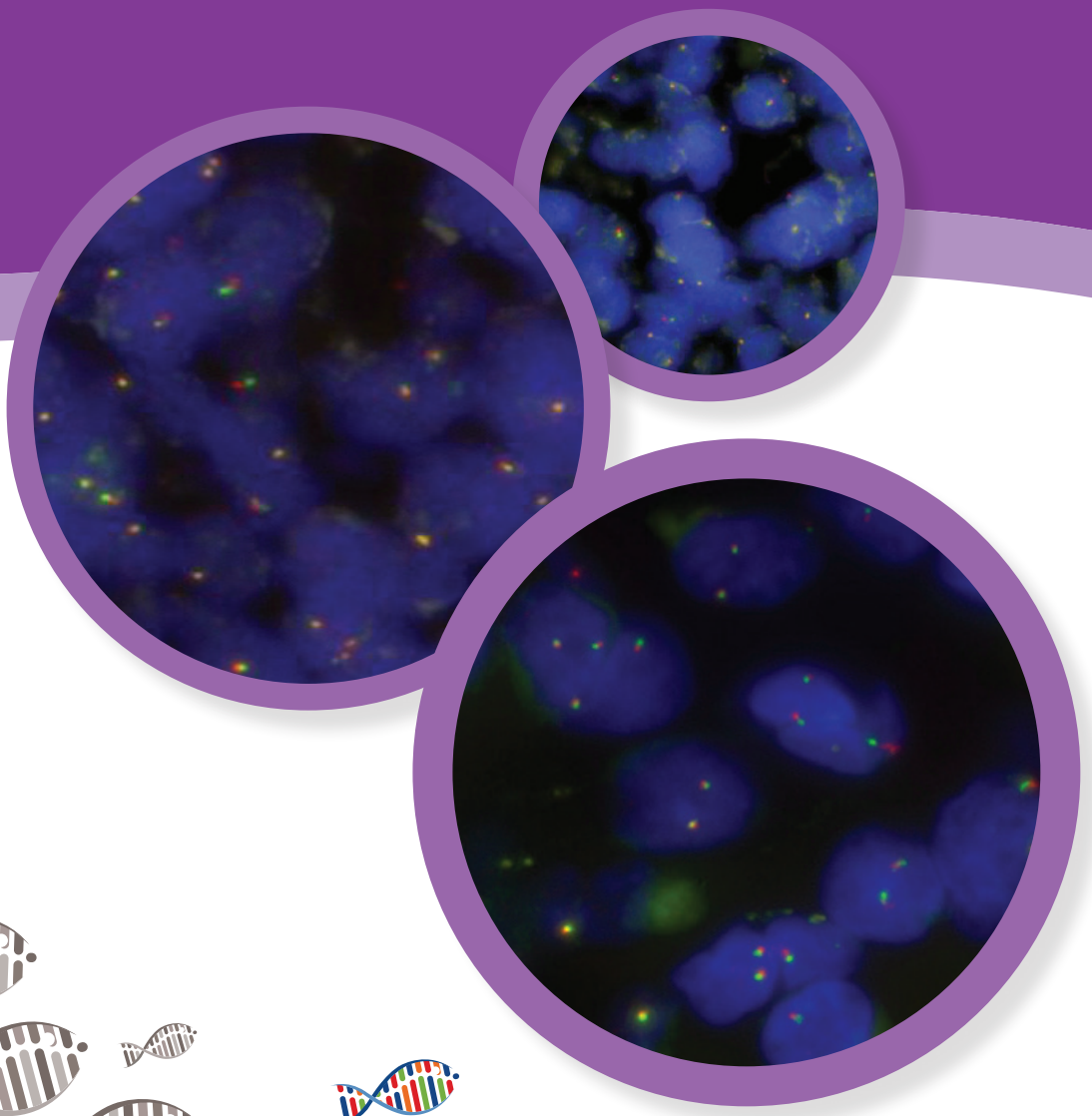
New Pathology Probes for 2017



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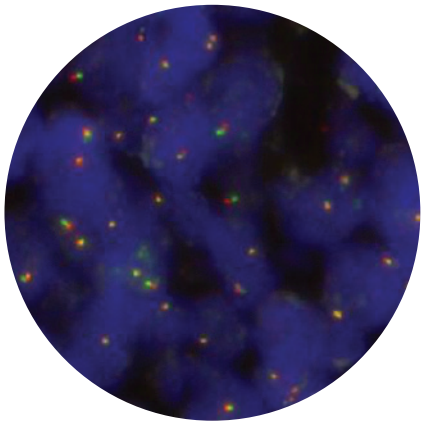
Cat. No. LPS 050-S (5 Tests)

Cat. No. LPS 050 (10 Tests)

FUS Breakapart Probe



The FUS *(FUS RNA binding protein)* gene at 16p11.2 is a member of the FET family of protein-encoding genes, closely-related to the EWSR1 *(EWS RNA binding protein 1)* gene[1].

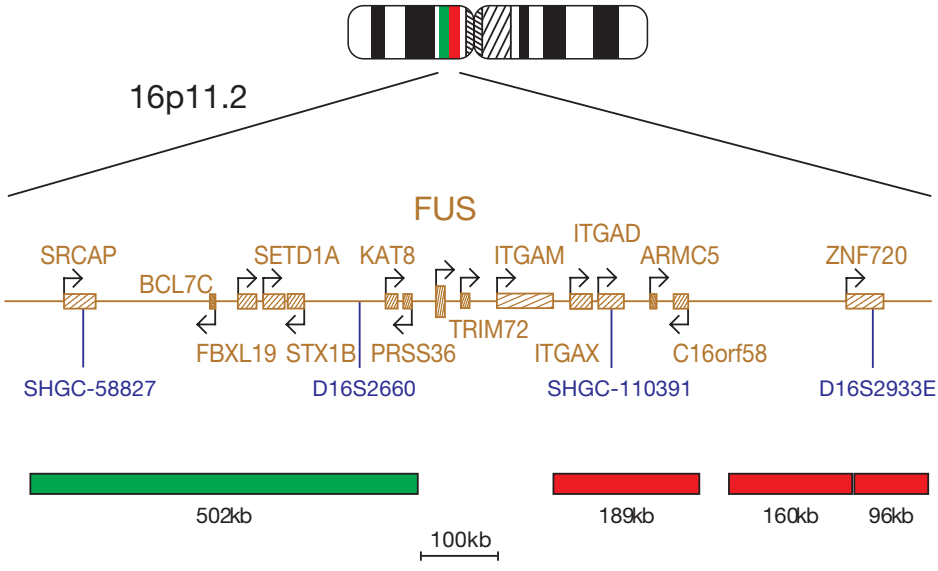
Recurrent rearrangements involving the FUS gene with a number of different partner genes have been reported in various types of neoplastic disease, notably soft tissue sarcomas and acute myeloid leukaemia. In some tumour types FUS and EWSR1 may replace each other as fusion partners[2].

In soft tissue sarcoma, approximately 90% of cases of myxoid liposarcoma are characterised by the presence of a FUS-DDIT3 rearrangement arising from a t(12;16)(q13;p11) translocation[3,4]; the FUS-CREB3L1 and the FUS-CREB3L2 fusions, resulting from t(11;16)(p11;p11) and t(7;16)(q32-34;p11) translocations respectively are characteristic of low-grade fibromyxoid sarcoma[5], whereas the t(12;16)(q13;p11) translocation resulting in a FUS-ATF1 fusion gene is seen in angiomatoid fibrous histiocytoma[6].

This breakapart probe has been designed to allow detection of FUS rearrangements regardless of the partner gene involved.

References:

1. Göransson, M. *et al.,* Oncogene 2009. 28:270–278
2. Andersson, M.K. *et al.,* BMC cell biology 2008. 9:37
3. Willeke, M. *et al.,* Clin Cancer Res. 1998. 4:1779–1784
4. Panagopoulos, I. *et al.,* Cancer Research 1994. 54:6500–6503
5. Mertens, F. *et al.,* Laboratory investigation 2005. 85:408-15
6. Tanas, M.R. *et al.,* Modern pathology 2010. 23:93–7



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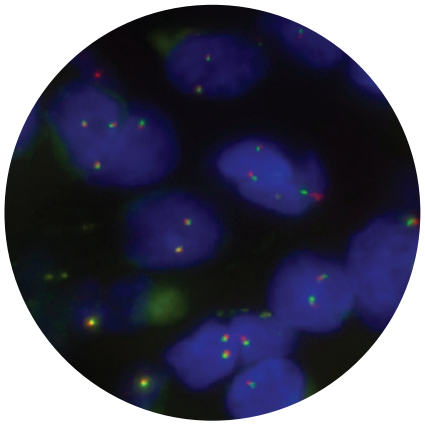
Cat. No. LPS 049-S (5 Tests)

Cat. No. LPS 049 (10 Tests)

FOXO1 Breakapart Probe



Translocations involving the FOXO1 *(forkhead box O1)* gene at 13q14.1 and either the PAX3 *(paired box 3)* gene at 2q36.1 or the PAX7 *(paired box 7)* gene at 1p36.1 are seen frequently in cases of alveolar rhabdomyosarcoma[1,2].

Rhabdomyosarcoma is the most common soft-tissue sarcoma seen in children and younger adults with two major histological subtypes: alveolar rhabdomyosarcoma (ARMS) and embryonal rhabdomyosarcoma (ERMS)[3]. FOXO1 rearrangements are recognised recurrent abnormalities seen in ARMS, but not seen in ERMS[1,2].

Approximately 55% of cases of ARMS are associated with a PAX3-FOXO1 rearrangement via a t(2;13)(q36.1;q14) translocation and 22% of cases of ARMS are associated with a PAX7-FOXO1 rearrangement via a t(1;13)(p36;q14) translocation[4]. These translocations lead to the fusion of transcription factor FOXO1 to the transcription factors PAX3 and PAX7 located at 2q36.1 and 1p36.13 respectively[2].

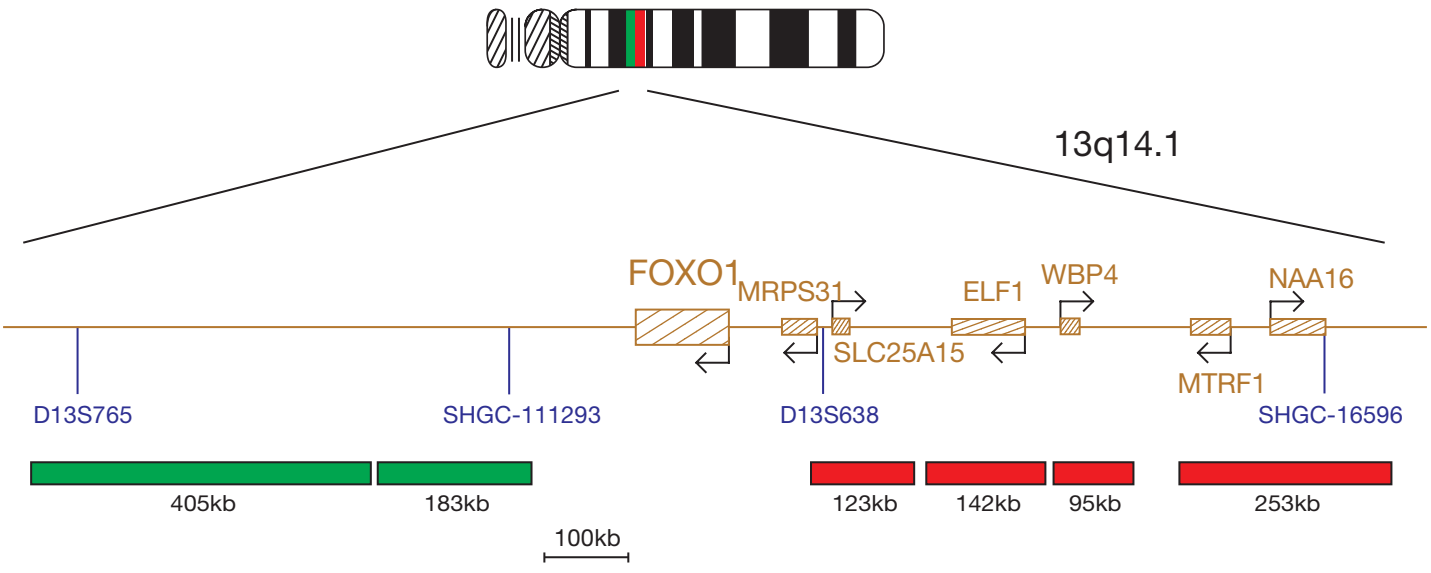
Studies have shown that ARMS patients with PAX-FOXO1 rearrangements have an inferior outcome compared to ERMS patients, whereas ARMS patients without PAX-FOXO1 rearrangements show similar outcomes to ERMS[2,5].

A subset of patients with ARMS may show fusion gene amplification. This is most commonly associated with the presence of PAX7-FOXO1 rearrangements and has been shown to be associated with significantly improved outcome over ARMS patients with PAX-FOXO1 rearrangements without fusion gene amplification[6].

This breakapart probe design allows the detection of FOXO1 rearrangements, regardless of the partner gene involved.

References:

1. Anderson *et al.,* Am J Pathol. 2001 Sep;159(3):1089-96
2. Jothi *et al.,* Mol Cancer Ther. 2013 Dec;12(12):2663-74
3. Ognjanovic *et al.,* Cancer 2009; 115(18): 4218–4226.
4. Sorensen *et al.,* J Clin Oncol. 2002;20(11):2672-9
5. Skapek *et al.,* Pediatr Blood Cancer. 2013 Sep;60(9):1411-7
6. Duan *et al.,* Genes Chromosomes Cancer. 2012 Jul;51(7):662-674



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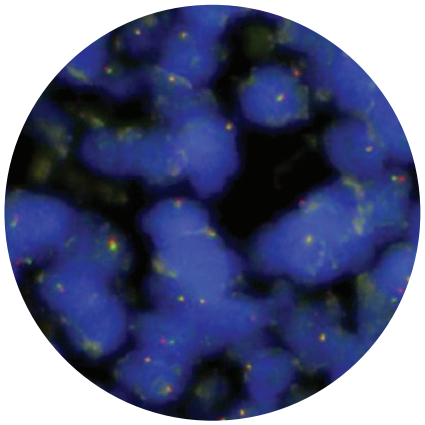
Cat. No. RU-LPS 051-S* (50µl)

Cat. No. RU-LPS 051* (100µl)

TFE3 Breakapart Probe*



TFE3 *(transcription factor binding to IGHM enhancer 3)* is a protein-coding gene located at Xp11.23. Recurrent rearrangements of the TFE3 gene have been reported in a number of neoplastic diseases – often grouped together as 'Xp11 translocation cancers' – these include: renal cell carcinoma (RCC), soft tissue alveolar soft part sarcoma (ASPS), perivascular epithelioid cell tumors (PEComa), epithelioid hemangioendotheliomas (EHE) and melanotic Xp11 translocation renal cancer[1,2].

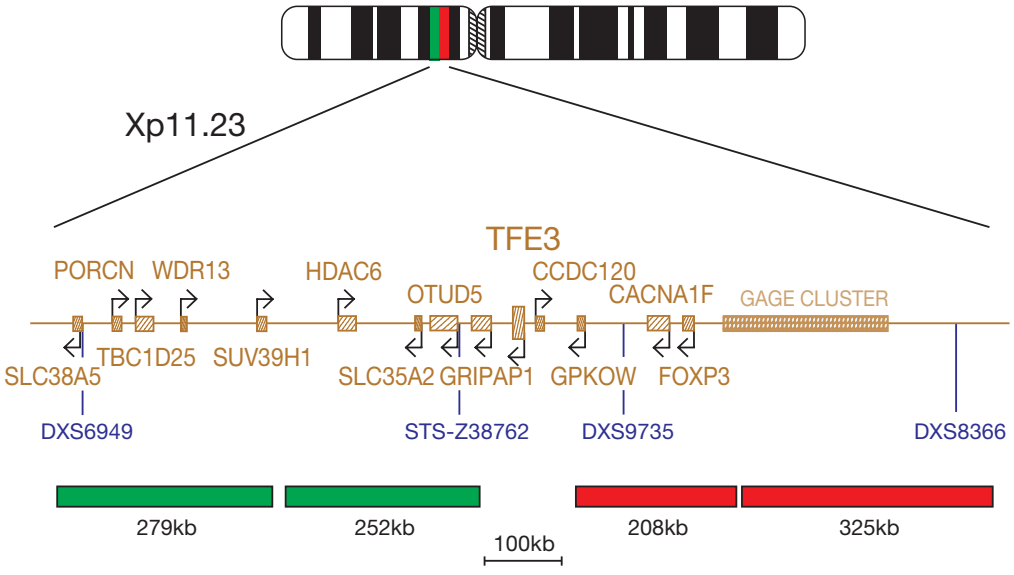
In RCC, TFE3 translocation partners have been shown to include the ASPSCR1, SFPQ and NONO genes[3]. Although RCC and ASPS have been shown to have identical ASPSCR1-TFE3 fusion transcripts, the t(X;17) translocation is consistently balanced in the former but usually unbalanced in the latter - the derivative X chromosome is not seen in ASPS[4].

In epithelioid hemangioendothelioma the novel YAP1-TFE3 fusion is seen, and defines a clinically distinct subset of this disease[5,6], whereas in PEComa, the predominant partner has been shown to be the SFPQ gene[7].

This research use only (RUO) probe has been designed for the investigation of TFE3 rearrangements, regardless of the partner gene involved.

References:

1. Eble JN, *et al.,* World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of the Urinary System and Male Genital Organs. Lyon: IARC Press; 2004.
2. Wu A *et al.,* Histopathology 2008;53(5):533-44
3. Hodge JC, *et al.,* Mod Pathol 2014 Jan;27(1):113–27.
4. Argani P, *et al.,* Am J Pathol 2001;159(1):179–92.
5. Antonescu CR, *et al.,* Genes, Chromosom Cancer. 2013 Aug;52(8):775–84.
6. Lee SJ, *et al.,* Oncotarget. 2016;7(7):7480–8.
7. Rao Q, *et al.,* Am J Surg Pathol. 2015 Sep;39(9):1181-96



* For research use only, not for use in diagnostic procedures.

The Cytocell® Advantage

Choosing Cytocell Aquarius FISH probes from OGT gives you the analytical confidence you require: our cost-effective, quality-assured probes are backed with our unparalleled customer service — we are also on hand to offer advice and evaluation support, should you need it.

Why Choose Cytocell Probes?

- **Enhanced detection and accurate scoring:** superior coverage with bright signals, reducing the number of cells with signal drop out
- **Confidence in your results:** excellent contrast with minimal background and specific high-intensity signals
- **Optimised** for use on FFPE specimens in conjunction with the Tissue Pretreatment Kit
- **Easy to use:** probes are pre-mixed, minimising errors and saving time
- **Ready-to-use** in five and ten test pack sizes: ensure optimal stock levels are kept with minimal wastage and re-validation

Pathology Probe Range

Probe Name	Chromosome Region	Probe Type	Control Probe	No. Tests	Cat. No.*
1p36/1q25 & 19q13/19p13	1p36.32/19q13.33	Deletion	1q25.2/19p13.2	5 or 10	LPS 047
ALK	2p23.2 p23.1	Breakapart	–	5 or 10	LPS 019
CHOP (DDIT3)	12q13.3	Breakapart	–	5 or 10	LPS 015
C-MET (MET)	7q31.2	Amplification	D7Z1	5 or 10	LPS 004
EGFR	7p11.2	Amplification	D7Z1	5 or 10	LPS 003
EML4	2p21	Breakapart	–	5 or 10	LPS 020
EWSR1	22q12.1-q12.2	Breakapart	–	5 or 10	LPS 006
EWSR1/ERG Dual Fusion	21q22.13-q22.2/22q12.1-q12.2	Translocation	–	5 or 10	LPS 008
FGFR1	8p11.23-p11.22	Breakapart/Amplification	D8Z2	5 or 10	LPS 018
FLI1/EWSR1 Dual Fusion	11q24.3/22q12.1-q12.2	Translocation	–	5 or 10	LPS 007
NEW FOXO1	13q14.1	Breakapart	–	5 or 10	LPS 049
NEW FUS	16p11.2	Breakapart	–	5 or 10	LPS 050
HER2 (ERBB2)	17q12	Amplification	D17Z1	5 or 10	LPS 001
MDM2	12q15	Amplification	D12Z1	5 or 10	LPS 016
N-MYC (MYCN)	2p24.3	Amplification	AFF3	5 or 10	LPS 009
PAX3	2q36.1	Breakapart	–	5 or 10	LPS 012
PAX7	1p36.13	Breakapart	–	5 or 10	LPS 013
RET	10q11.21	Breakapart	–	5 or 10	LPS 045
ROS1	6q22.1	Breakapart	–	5 or 10	LPS 022
ROS1 Plus	6q22.1	Breakapart	–	5 or 10	LPS 046
SRD (CHD5)	1p36.31	Deletion	ZNF672	5 or 10	LPS 010
SYT (SS18)	18q11.2	Breakapart	–	5 or 10	LPS 014
NEW TFE3	Xp11.23	Breakapart	–	50µl or 100µl	RU-LPS 051
TMPRSS2/ERG	21q22.2-q22.3/21q22.13-q22.2	Deletion/Breakapart	ERG	5 or 10	LPS 021
TOP2A	17q21.2	Amplification/Deletion	D17Z1	5 or 10	LPS 002
ZNF217	20q13.2	Amplification	DEFB128	5 or 10	LPS 005
Pretreatment Kit	**–**	**–**	**–**	**–**	**LPS 100†**

* for 5 test kit add -S to catalog number, e.g: LPS ###-S

Haematopathology Probe Range

Probe Name	Chromosome Region	Probe Type	Control Probe	No. Tests	Cat. No.*
BCL2	18q21.33-q22.1	Breakapart	–	5 or 10	LPS 028
BCL6	3q27.3-q28	Breakapart	–	5 or 10	LPS 029
CCND1	11q13.3	Breakapart	–	5 or 10	LPS 030
IGH	14q32.33	Breakapart	–	5 or 10	LPS 032
IGH/BCL2 Dual Fusion	14q32.33/18q21.33-q22.1	Translocation	–	5 or 10	LPS 033
IGH/CCND1 Dual Fusion	14q32.33/11q13.3	Translocation	–	5 or 10	LPS 031
IGH/MALT1 Dual Fusion	14q32.33/18q21.31-q21.32	Translocation	–	5 or 10	LPS 034
IGH/MYC Dual Fusion	14q32.33/8q24.21	Translocation	–	5 or 10	LPS 035
IGK	2p11.2	Breakapart	–	5 or 10	LPS 038
IGL	22q11.21-q11.23	Breakapart	–	5 or 10	LPS 039
MALT1	18q21.31-q21.32	Breakapart	–	5 or 10	LPS 017
MYC	8q24.21	Breakapart	–	5 or 10	LPS 027
P16 (CDKN2A)	9p21.3	Deletion	D9Z3	5 or 10	LPS 036
P53 (TP53)	17p13.1	Deletion	D17Z1	5 or 10	LPS 037
RB1	13q14.2	Deletion	LAMP1	5 or 10	LPS 011

* for 5 test kit add -S to catalog number, e.g: LPS ###-S

Visit www.cytocell.com for full details of our FISH ranges and for technical advice on how to get the most from your probes.

Tissue Pretreatment Kit

Cat. No. LPS 100†

Introducing the first pretreatment kit capable of preparing slides for CISH and/or FISH analysis on formalin-fixed, paraffin-embedded (FFPE) tissue.

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To further extend the utility of the kit we have also validated its use with other commercially available CISH (chromogenic in situ hybridisation) and FISH (fluorescence in situ hybridisation) DNA probes**.

**A list of manufacturers is available upon request.

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