

qBiomarker Somatic Mutation PCR Array

Human PDGFR Pathway

Cat. no. 337021 SMH-004

For real-time PCR-based, pathway-focused, somatic mutation profiling

Format	For use with the following real-time cyclers
Format A, with fluorescein	Bio-Rad® models iCycler®, iQ™ 5, MyiQ™, MyiQ2
Format A, with ROX™	Applied Biosystems® models 5700, 7000, 7300, 7500, 7700, 7900HT, ViiA™ 7 (96-well blocks); Bio-Rad/MJ Research Chromo4™; Eppendorf® Mastercycler® ep realplex models 2, 2s, 4, 4s; Stratagene® models Mx3005P®, Mx3000P®
Format C, with ROX	Applied Biosystems models 7500 (Fast, 96-well block), 7900HT (Fast, 96-well block), StepOnePlus™, ViiA 7 (Fast, 96-well block)
Format D, with ROX	Bio-Rad CFX96™; Bio-Rad/MJ Research models DNA Engine Opticon®, DNA Engine Opticon 2; Stratagene Mx4000®
Format E, with ROX	Applied Biosystems models 7900HT (384-well block), ViiA 7 (384-well block); Bio-Rad CFX384™
Format F, with ROX	Roche® LightCycler® 480 (96-well block)
Format G, with ROX	Roche LightCycler 480 (384-well block)



Sample & Assay Technologies

Description

Platelet-derived growth factors (PDGFs) and their receptors (PDGFRs) have served as prototypes for growth factor and receptor tyrosine kinase (RTK) function for more than two decades, and are implicated in a range of diseases. While autocrine activation of PDGF signaling is involved in certain gliomas, sarcomas, and leukemias, paracrine PDGF signaling has been frequently observed in epithelial cancers, where it triggers stromal recruitment and has been implicated in epithelial–mesenchymal transition, thereby affecting tumor growth, angiogenesis, invasion, and metastasis. Mutations in the PDGFR-A gene constitute one major class of genetic alterations that lead to gastrointestinal stromal tumors (GIST), one of the most common mesenchymal tumors of the gastrointestinal tract. Mutations in the PDGFR-A gene are the targets of drug therapies and other agents. Specific PDGFR-A gene mutations appear to confer differential drug sensitivity. Activation of the PDGFR pathway involves key downstream mediators, including mitogen-activated protein kinase (MAPK), phosphoinositide 3-kinase (PI3K), and phospholipase- γ pathways. These downstream components are also possible targets of inhibition. The Human PDGFR Pathway qBiomarker Somatic Mutation PCR Array is a translational research tool that allows rapid and accurate profiling of the somatic mutation status of the PDGFR-A gene and additional key genes in the PDGFR signaling pathway / network: AKT, BRAF, KRAS, HRAS, NRAS, MEK1, PIK3CA, and PTEN. Gene components were selected based on their frequency of mutation in human cancers. The utility of individual and multiple somatic mutation status information in identifying key signaling transduction disruptions has been demonstrated in numerous research studies. For example, the mutation status of the EGFR and KRAS genes can predict the physiological response to certain drugs targeting these molecules. The PDGFR Pathway qBiomarker Somatic Mutation PCR Array, with its comprehensive content coverage, is designed for studying mutations in the context of the PDGFR pathway and downstream effectors. This array covers 85 DNA sequence mutation assays designed to detect the most frequent, functionally verified, and biologically most significant mutations in the PDGFR pathway. These mutations were chosen from curated, comprehensive somatic mutation databases and peer-reviewed scientific literature. The simplicity of the product format and operating procedure allows routine somatic mutation profiling in any research laboratory with access to real-time PCR instruments.

For further details, consult the *qBiomarker Somatic Mutation PCR Handbook*.

Shipping and storage

qBiomarker Somatic Mutation PCR Arrays are shipped at ambient temperature or on blue ice packs. For long term storage, keep plates at -20°C . Ensure that you have the correct qBiomarker Somatic Mutation PCR Array format for your real-time cycler (see table above). qBiomarker Probe Mastermixes are shipped on blue ice packs. For long term storage, keep qBiomarker Probe

Mastermixes at 4°C.

Note: Ensure that you have the correct qBiomarker Probe Mastermix, with the correct reference dye if required, for your instrument.

Note: Open the package and store the products appropriately immediately on receipt.

Assay table

Position	Gene	COSMIC ID	Nucleotide Change	Amino Acid Change	Assay Catalog #
A01	AKT1	33765	c.49G>A	p.E17K	SMPH017162A
A02	BRAF	450	c.1391G>T	p.G464V	SMPH001927A
A03	BRAF	451	c.1397G>T	p.G466V	SMPH001870A
A04	BRAF	460	c.1406G>C	p.G469A	SMPH001906A
A05	BRAF	1130	c.1798G>A	p.V600M	SMPH001846A
A06	BRAF	476	c.1799T>A	p.V600E	SMPH001828A
A07	BRAF	18443	c.1799T>C	p.V600A	SMPH001845A
A08	BRAF	6137	c.1799T>G	p.V600G	SMPH001912A
A09	KRAS	552	c.182A>G	p.Q61R	SMPH007553A
A10	KRAS	553	c.182A>T	p.Q61L	SMPH007544A
A11	KRAS	555	c.183A>T	p.Q61H	SMPH007546A
A12	KRAS	517	c.34G>A	p.G12S	SMPH007533A
B01	KRAS	518	c.34G>C	p.G12R	SMPH007534A
B02	KRAS	516	c.34G>T	p.G12C	SMPH007535A
B03	KRAS	521	c.35G>A	p.G12D	SMPH007531A
B04	KRAS	522	c.35G>C	p.G12A	SMPH007536A
B05	KRAS	520	c.35G>T	p.G12V	SMPH007537A
B06	KRAS	528	c.37G>A	p.G13S	SMPH007543A
B07	KRAS	529	c.37G>C	p.G13R	SMPH007549A
B08	KRAS	527	c.37G>T	p.G13C	SMPH007541A
B09	KRAS	532	c.38G>A	p.G13D	SMPH007538A
B10	KRAS	533	c.38G>C	p.G13A	SMPH007542A
B11	KRAS	534	c.38G>T	p.G13V	SMPH007545A
B12	HRAS	496	c.181C>A	p.Q61K	SMPH006505A
C01	HRAS	499	c.182A>G	p.Q61R	SMPH006502A
C02	HRAS	498	c.182A>T	p.Q61L	SMPH006503A
C03	HRAS	502	c.183G>T	p.Q61H	SMPH006516A
C04	HRAS	480	c.34G>A	p.G12S	SMPH006499A
C05	HRAS	482	c.34G>C	p.G12R	SMPH006506A
C06	HRAS	481	c.34G>T	p.G12C	SMPH006500A
C07	HRAS	484	c.35G>A	p.G12D	SMPH006507A
C08	HRAS	483	c.35G>T	p.G12V	SMPH006497A
C09	HRAS	486	c.37G>C	p.G13R	SMPH006498A
C10	HRAS	488	c.37G>T	p.G13C	SMPH006511A
C11	NRAS	580	c.181C>A	p.Q61K	SMPH010073A
C12	NRAS	582	c.182A>C	p.Q61P	SMPH010096A
D01	NRAS	584	c.182A>G	p.Q61R	SMPH010069A
D02	NRAS	583	c.182A>T	p.Q61L	SMPH010076A
D03	NRAS	563	c.34G>A	p.G12S	SMPH010075A
D04	NRAS	564	c.35G>A	p.G12D	SMPH010071A
D05	NRAS	565	c.35G>C	p.G12A	SMPH010066A
D06	NRAS	569	c.37G>C	p.G13R	SMPH010074A
D07	NRAS	573	c.38G>A	p.G13D	SMPH010070A
D08	NRAS	575	c.38G>C	p.G13A	SMPH010084A
D09	NRAS	574	c.38G>T	p.G13V	SMPH010082A
D10	NRAS	577	c.52G>A	p.A18T	SMPH010105A
D11	MEK1	99000002	167A>C	Q56P	SMPH017164A
D12	MEK1	99000004	171G>T	K57N	SMPH017166A
E01	MEK1	99000001	199G>A	D67N	SMPH017163A
E02	MEK1	99000003	371C>T	P124L	SMPH017165A
E03	PIK3CA	759	c.1616C>G	p.P539R	SMPH010637A
E04	PIK3CA	760	c.1624G>A	p.E542K	SMPH010629A
E05	PIK3CA	763	c.1633G>A	p.E545K	SMPH010627A
E06	PIK3CA	764	c.1634A>G	p.E545G	SMPH010633A
E07	PIK3CA	765	c.1635G>T	p.E545D	SMPH010638A
E08	PIK3CA	775	c.3140A>G	p.H1047R	SMPH010630A
E09	PIK3CA	776	c.3140A>T	p.H1047L	SMPH010632A
E10	PTEN	5033	c.389G>A	p.R130Q	SMPH011486A
E11	PTEN	5219	c.388C>G	p.R130G	SMPH011480A
E12	PTEN	5152	c.388C>T	p.R130*	SMPH011473A
F01	PTEN	5089	c.517C>T	p.R173C	SMPH011475A
F02	PTEN	5039	c.518G>A	p.R173H	SMPH011472A
F03	PTEN	5154	c.697C>T	p.R233*	SMPH011506A
F04	PDGFRA	21973	c. 1659_1664delGAGGTA	p.R554_Y555del	SMPH010454A
F05	PDGFRA	741	c.1678_1692del15	p.R560_S564del	SMPH010497A
F06	PDGFRA	739	c.1682T>A	p.V561D	SMPH010452A
F07	PDGFRA	28053	c.1694_1695insA	p.S566fs*6	SMPH010466A
F08	PDGFRA	742	c.1696_1713>CGC	p.S566_E571>R	SMPH010473A
F09	PDGFRA	12417	c.1697_1711del15	p.S566_E571>K	SMPH010472A
F10	PDGFRA	12418	c.1698_1712del15	p.S566_E571>R	SMPH010471A
F11	PDGFRA	22416	c.1975A>T	p.N659Y	SMPH010460A

Position	Gene	COSMIC ID	Nucleotide Change	Amino Acid Change	Assay Catalog #
F12	PDGFRA	743	c.2021C>T	p.T674I	SMPH010461A
G01	PDGFRA	12401	c.2524_2532del9	p.D842_M844del	SMPH010485A
G02	PDGFRA	737	c.2524_2535del12	p.D842_H845del	SMPH010476A
G03	PDGFRA	12411	c.2524_2536>A	p.D842_D846>N	SMPH010491A
G04	PDGFRA	12396	c.2524G>T	p.D842Y	SMPH010481A
G05	PDGFRA	12412	c.2525_2538>GA	p.D842_D846>G	SMPH010492A
G06	PDGFRA	736	c.2525A>T	p.D842V	SMPH010453A
G07	PDGFRA	12408	c.2526_2538>G	p.D842_D846>E	SMPH010489A
G08	PDGFRA	12415	c.2526_2541>GGCC	p.D842_S847>EA	SMPH010494A
G09	PDGFRA	12400	c.2527_2538del12	p.I843_D846del	SMPH010484A
G10	PDGFRA	12407	c.2528_2539del12	p.I843_S847>T	SMPH010488A
G11	PDGFRA	12402	c.2530_2541del12	p.M844_S847del	SMPH010463A
G12	PDGFRA	738	c. 2534_2543ATGATTCG AA>C	p.H845_N848>P	SMPH010502A
H01	PDGFRA	12399	c.2536G>T	p.D846Y	SMPH010483A
H02	AKT1	99000005	copy number	copy number	SMPH017167A
H03	BRAF	99000006	copy number	copy number	SMPH017168A
H04	KRAS	99000008	copy number	copy number	SMPH017170A
H05	HRAS	99000009	copy number	copy number	SMPH017171A
H06	NRAS	99000010	copy number	copy number	SMPH017172A
H07	MEK1	99000011	copy number	copy number	SMPH017173A
H08	PIK3CA	99000012	copy number	copy number	SMPH017174A
H09	PTEN	99000013	copy number	copy number	SMPH017175A
H10	PDGFRA	99000014	copy number	copy number	SMPH017176A
H11	SMPC	99000017	positive PCR control	positive PCR control	SMPH017179A
H12	SMPC	99000017	positive PCR control	positive PCR control	SMPH017179A

Array layout

	1	2	3	4	5	6	7	8	9	10	11	12
A	AKT1	BRAF	BRAF	BRAF	BRAF	BRAF	BRAF	BRAF	KRAS	KRAS	KRAS	KRAS
B	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	KRAS	HRAS
C	HRAS	HRAS	HRAS	HRAS	HRAS	HRAS	HRAS	HRAS	HRAS	HRAS	NRAS	NRAS
D	NRAS	NRAS	NRAS	NRAS	NRAS	NRAS	NRAS	NRAS	NRAS	NRAS	MEK1	MEK1
E	MEK1	MEK1	PIK3CA	PIK3CA	PIK3CA	PIK3CA	PIK3CA	PIK3CA	PIK3CA	PTEN	PTEN	PTEN
F	PTEN	PTEN	PTEN	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA
G	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA	PDGFRA
H	PDGFRA	AKT1	BRAF	KRAS	HRAS	NRAS	MEK1	PIK3CA	PTEN	PDGFRA	SMPC	SMPC

qBiomarker Somatic Mutation PCR Array products are intended for molecular biology applications. These products are not intended for the diagnosis, prevention, or treatment of a disease.

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