

# qBiomarker Somatic Mutation PCR Array

## Human Skin Cancers

Cat. no. 337021 SMH-024A

**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

The Human Skin Cancer qBiomarker Somatic Mutation PCR Array is a translational research tool that allows rapid, accurate and comprehensive profiling of the top somatic mutations in human skin cancer samples in the following genes: BRAF, CDKN2A, CTNNB1/beta-catenin, FGFR3, GNAQ, HRAS, KIT, KRAS, NRAS, PIK3CA, PTCH1, PTEN, RB1, SMO, LKB1/STK11, and P53. These mutations warrant extensive investigation to enhance the understanding of carcinogenesis and identify potential drug targets. Numerous research studies have demonstrated the utility of individual and multiple somatic mutation status information in identifying key signaling transduction disruptions. For example, the mutation status of the EGFR and KRAS genes can predict the physiological response to certain drugs targeting these molecules. The Human Skin Cancer qBiomarker Somatic Mutation PCR Array, with its comprehensive content coverage, is designed for the study of mutations in the context of skin cancer and has the potential for discovery and verification of drug target biomarkers for skin cancer types and other cancer types in which these mutations have been identified. This array includes 78 DNA sequence mutation assays designed to detect the most frequent, functionally verified, and biologically significant mutations in human skin cancers. These mutations were chosen from curated, comprehensive somatic mutation databases and peer-reviewed scientific literature, and represent the most frequently recurring somatic mutations compiled from over 7100 skin cancer samples. 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  $-20^{\circ}\text{C}$ . 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  $4^{\circ}\text{C}$ .

**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.

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## Assay table

| Position | Gene   | COSMIC ID | Nucleotide Change | Amino Acid Change | Assay Catalog # |
|----------|--------|-----------|-------------------|-------------------|-----------------|
| A01      | BRAF   | 1125      | c.1790T>A         | p.L597Q           | SMPH001855A     |
| A02      | BRAF   | 473       | c.1798_1799GT>AA  | p.V600K           | SMPH001831A     |
| A03      | BRAF   | 474       | c.1798_1799GT>AG  | p.V600R           | SMPH001833A     |
| A04      | BRAF   | 475       | c.1799_1800TG>AA  | p.V600E           | SMPH001832A     |
| A05      | BRAF   | 477       | c.1799_1800TG>AT  | p.V600D           | SMPH001940A     |
| A06      | BRAF   | 476       | c.1799T>A         | p.V600E           | SMPH001828A     |
| A07      | BRAF   | 478       | c.1801A>G         | p.K601E           | SMPH001863A     |
| A08      | CDKN2A | 12743     | c.143C>T          | p.P48L            | SMPH002676A     |
| A09      | CDKN2A | 12473     | c.172C>T          | p.R58*            | SMPH002668A     |
| A10      | CDKN2A | 13524     | c.237_238CC>TT    | p.R80*            | SMPH003024A     |
| A11      | CDKN2A | 12475     | c.238C>T          | p.R80*            | SMPH002667A     |
| A12      | CDKN2A | 13224     | c.242C>T          | p.P81L            | SMPH002745A     |
| B01      | CDKN2A | 12547     | c.330G>A          | p.W110*           | SMPH002718A     |
| B02      | CDKN2A | 12476     | c.341C>T          | p.P114L           | SMPH002680A     |
| B03      | CTNNB1 | 5671      | c.101G>A          | p.G34E            | SMPH003960A     |
| B04      | CTNNB1 | 5666      | c.110C>A          | p.S37Y            | SMPH003961A     |
| B05      | CTNNB1 | 5679      | c.110C>G          | p.S37C            | SMPH003962A     |
| B06      | CTNNB1 | 5662      | c.110C>T          | p.S37F            | SMPH003946A     |
| B07      | CTNNB1 | 5676      | c.122C>T          | p.T41I            | SMPH003952A     |
| B08      | CTNNB1 | 5667      | c.134C>T          | p.S45F            | SMPH003953A     |
| B09      | CTNNB1 | 5661      | c.94G>T           | p.D32Y            | SMPH003956A     |
| B10      | CTNNB1 | 5669      | c.98C>T           | p.S33F            | SMPH003964A     |
| B11      | FGFR3  | 716       | c.1108G>T         | p.G370C           | SMPH005551A     |
| B12      | FGFR3  | 17461     | c.1111A>T         | p.S371C           | SMPH005553A     |
| C01      | FGFR3  | 718       | c.1118A>G         | p.Y373C           | SMPH005550A     |
| C02      | FGFR3  | 719       | c.1948A>G         | p.K650E           | SMPH005557A     |
| C03      | FGFR3  | 720       | c.1949A>T         | p.K650M           | SMPH005558A     |
| C04      | FGFR3  | 714       | c.742C>T          | p.R248C           | SMPH005552A     |
| C05      | GNAQ   | 28759     | c.625_626CA>TT    | p.Q209L           | SMPH006152A     |
| C06      | GNAQ   | 28758     | c.626A>C          | p.Q209P           | SMPH006151A     |
| C07      | GNAQ   | 28757     | c.626A>T          | p.Q209L           | SMPH006150A     |
| C08      | HRAS   | 496       | c.181C>A          | p.Q61K            | SMPH006505A     |
| C09      | HRAS   | 499       | c.182A>G          | p.Q61R            | SMPH006502A     |
| C10      | HRAS   | 498       | c.182A>T          | p.Q61L            | SMPH006503A     |
| C11      | HRAS   | 502       | c.183G>T          | p.Q61H            | SMPH006516A     |
| C12      | HRAS   | 480       | c.34G>A           | p.G12S            | SMPH006499A     |
| D01      | HRAS   | 481       | c.34G>T           | p.G12C            | SMPH006500A     |
| D02      | HRAS   | 484       | c.35G>A           | p.G12D            | SMPH006507A     |
| D03      | HRAS   | 483       | c.35G>T           | p.G12V            | SMPH006497A     |
| D04      | KIT    | 1290      | c.1727T>C         | p.L576P           | SMPH007118A     |
| D05      | KIT    | 1304      | c.1924A>G         | p.K642E           | SMPH007132A     |
| D06      | KRAS   | 553       | c.182A>T          | p.Q61L            | SMPH007544A     |
| D07      | KRAS   | 521       | c.35G>A           | p.G12D            | SMPH007531A     |
| D08      | KRAS   | 520       | c.35G>T           | p.G12V            | SMPH007537A     |
| D09      | NRAS   | 580       | c.181C>A          | p.Q61K            | SMPH010073A     |
| D10      | NRAS   | 584       | c.182A>G          | p.Q61R            | SMPH010069A     |
| D11      | NRAS   | 583       | c.182A>T          | p.Q61L            | SMPH010076A     |
| D12      | NRAS   | 586       | c.183A>C          | p.Q61H            | SMPH010072A     |
| E01      | NRAS   | 585       | c.183A>T          | p.Q61H            | SMPH010068A     |
| E02      | NRAS   | 563       | c.34G>A           | p.G12S            | SMPH010075A     |
| E03      | NRAS   | 564       | c.35G>A           | p.G12D            | SMPH010071A     |
| E04      | NRAS   | 569       | c.37G>C           | p.G13R            | SMPH010074A     |
| E05      | NRAS   | 573       | c.38G>A           | p.G13D            | SMPH010070A     |
| E06      | NRAS   | 574       | c.38G>T           | p.G13V            | SMPH010082A     |
| E07      | NRAS   | 577       | c.52G>A           | p.A18T            | SMPH010105A     |
| E08      | PIK3CA | 760       | c.1624G>A         | p.E542K           | SMPH010629A     |
| E09      | PIK3CA | 763       | c.1633G>A         | p.E545K           | SMPH010627A     |
| E10      | PIK3CA | 764       | c.1634A>G         | p.E545G           | SMPH010633A     |
| E11      | PTCH1  | 14440     | c.1093C>T         | p.Q365*           | SMPH011301A     |
| E12      | PTCH1  | 17472     | c.1249C>T         | p.Q417*           | SMPH011228A     |
| F01      | PTCH1  | 26363     | c.2446C>T         | p.Q816*           | SMPH011232A     |
| F02      | PTEN   | 5294      | c.416T>G          | p.L139*           | SMPH011794A     |
| F03      | RB1    | 895       | c.1363C>T         | p.R455*           | SMPH012679A     |
| F04      | SMO    | 13146     | c.1604G>T         | p.W535L           | SMPH013985A     |
| F05      | STK11  | 20943     | c.508C>T          | p.Q170*           | SMPH014238A     |
| F06      | TP53   | 10768     | c.535C>T          | p.H179Y           | SMPH015208A     |
| F07      | TP53   | 10733     | c.574C>T          | p.Q192*           | SMPH015161A     |
| F08      | TP53   | 10654     | c.637C>T          | p.R213*           | SMPH014928A     |
| F09      | TP53   | 6932      | c.733G>A          | p.G245S           | SMPH014940A     |
| F10      | TP53   | 10656     | c.742C>T          | p.R248W           | SMPH014929A     |
| F11      | TP53   | 10988     | c.772G>A          | p.E258K           | SMPH015102A     |
| F12      | TP53   | 10867     | c.797G>A          | p.G266E           | SMPH015003A     |

| Position | Gene   | COSMIC ID | Nucleotide Change    | Amino Acid Change    | Assay Catalog # |
|----------|--------|-----------|----------------------|----------------------|-----------------|
| G01      | TP53   | 10939     | c.832C>T             | p.P278S              | SMPH014915A     |
| G02      | TP53   | 10863     | c.833C>T             | p.P278L              | SMPH015086A     |
| G03      | TP53   | 10728     | c.839G>A             | p.R280K              | SMPH015091A     |
| G04      | TP53   | 43585     | c.843_844CC>TT       | p.R282W              | SMPH034842A     |
| G05      | TP53   | 10704     | c.844C>T             | p.R282W              | SMPH014941A     |
| G06      | TP53   | 10726     | c.856G>A             | p.E286K              | SMPH015084A     |
| G07      | BRAF   | 99000006  | copy number          | copy number          | SMPH017168A     |
| G08      | CDKN2A | 99000032  | copy number          | copy number          | SMPH017194A     |
| G09      | CTNNB1 | 99000042  | copy number          | copy number          | SMPH017204A     |
| G10      | FGFR3  | 99000020  | copy number          | copy number          | SMPH017182A     |
| G11      | GNAQ   | 99000044  | copy number          | copy number          | SMPH017206A     |
| G12      | HRAS   | 99000009  | copy number          | copy number          | SMPH017171A     |
| H01      | KIT    | 99000021  | copy number          | copy number          | SMPH017183A     |
| H02      | KRAS   | 99000008  | copy number          | copy number          | SMPH017170A     |
| H03      | NRAS   | 99000010  | copy number          | copy number          | SMPH017172A     |
| H04      | PIK3CA | 99000012  | copy number          | copy number          | SMPH017174A     |
| H05      | PTCH1  | 99000034  | copy number          | copy number          | SMPH017196A     |
| H06      | PTEN   | 99000013  | copy number          | copy number          | SMPH017175A     |
| H07      | RB1    | 99000036  | copy number          | copy number          | SMPH017198A     |
| H08      | SMO    | 99000055  | copy number          | copy number          | SMPH017217A     |
| H09      | STK11  | 99000038  | copy number          | copy number          | SMPH017200A     |
| H10      | TP53   | 99000041  | copy number          | copy number          | SMPH017203A     |
| 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 | BRAF   | BRAF   | BRAF   | BRAF   | BRAF   | BRAF   | BRAF   | CDKN2A | CDKN2A | CDKN2A | CDKN2A | CDKN2A |
| B | CDKN2A | CDKN2A | CTNNB1 | CTNNB1 | CTNNB1 | CTNNB1 | CTNNB1 | CTNNB1 | CTNNB1 | CTNNB1 | FGFR3  | FGFR3  |
| C | FGFR3  | FGFR3  | FGFR3  | FGFR3  | GNAQ   | GNAQ   | GNAQ   | HRAS   | HRAS   | HRAS   | HRAS   | HRAS   |
| D | HRAS   | HRAS   | HRAS   | KIT    | KIT    | KRAS   | KRAS   | KRAS   | NRAS   | NRAS   | NRAS   | NRAS   |
| E | NRAS   | NRAS   | NRAS   | NRAS   | NRAS   | NRAS   | NRAS   | PIK3CA | PIK3CA | PIK3CA | PTCH1  | PTCH1  |
| F | PTCH1  | PTEN   | RB1    | SMO    | STK11  | TP53   | TP53   | TP53   | TP53   | TP53   | TP53   | TP53   |
| G | TP53   | TP53   | TP53   | TP53   | TP53   | TP53   | BRAF   | CDKN2A | CTNNB1 | FGFR3  | GNAQ   | HRAS   |
| H | KIT    | KRAS   | NRAS   | PIK3CA | PTCH1  | PTEN   | RB1    | SMO    | STK11  | TP53   | 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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**Sample & Assay Technologies**