

Direct access to same-day-results



Fully automated Molecular Diagnostics



www.biocartis.com



"We at Biocartis aim to provide direct access to personalized medicine for patients worldwide by developing fully integrated and broadly applicable molecular diagnostics. Our platform can be used in a wide variety of healthcare settings to enable rapid and high-quality care close to patients"

Rudi Pauwels, CEO Biocartis



The need for improved, standardized and fast diagnostics

Cancer can hit anyone at any time and treatment remains a real challenge. Because cancer doesn't follow rules. It fights back against therapies. It adapts. It changes its path. It does whatever it can to stay ahead of us.

At the advanced edge of oncology, **rapid access** to **accurate data** about relevant cancer mutations and treatment resistance is vital and creates the opportunity for early disease interception^{4,5}, reducing the anxiety while waiting for results and the time before starting the best possible treatment. Current technologies in molecular oncology are complex, require a lot of hands-on time and are often difficult to implement in the local laboratory. As a consequence, most laboratories do not perform molecular tests in-house, but send them out to specialized centers, where samples are batched in order to optimize costs.¹⁻³

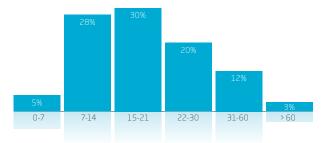
This causes delay to the fast delivery of results, preventing rapid initiation of correct therapy. In the meantime the tumor grows, which is detrimental in case of aggressively growing cancers.

The need for a rapid treatment initiation response towards patients

Fast initiation of immunotherapy or targeted therapy as first-line treatment is crucial for cancer patients, as it increases overall survival rates.^{9,10,11,17,22} Timely detection of biomarkers therefore is very important.

Today, turnaround times of reference technologies are on average 18 days, with 14% of patients waiting longer than a month to be able to start treatment. Ninety-five percent of the patients have to wait more than a week in order to receive the biomarker results.⁶

Total turnaround time of reference technologies

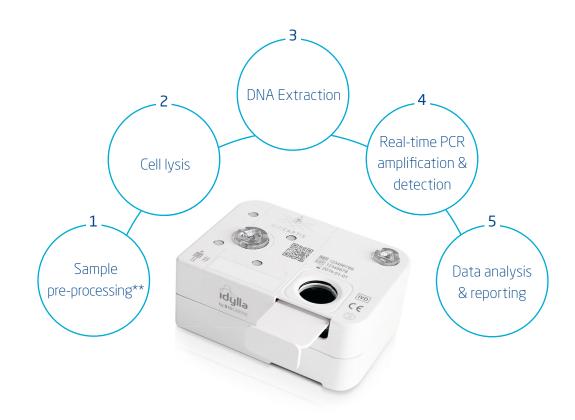


This means that precious time is lost whereas treatment initiation could have been started and unnecessary use of chemotherapy with its side effects could have been avoided.

Idylla[™], the next level in disease interception

Idylla^{TM,} a **fully automated**, sample-to-result PCR based **molecular diagnostics** system, provides **sameday** results enabling physicians to make **timely decisions** on patients' therapy.

Idylla^{TM,} can be used with **multiple sample types**, including **solid** and **liquid*** biopsies. This flexibility allows use of the system for respectively **diagnosis**, and **research** or possibly future **monitoring** applications. ldylla[™], with its **compact scalable design** and **outstanding ease of use**, overcomes the traditional barriers of molecular diagnostics, allowing it to be used in virtually **any laboratory setting**.



* Liquid biopsy currently available only for research applications

** e.g. deparaffinization for FFPE tissue samples

Idylla[™] is the first and only molecular diagnostic system that combines:

EASE OF USE

- Fully automated sample-to-result process
- Walk-away system (no need for any intervention during the automatic process)
- All reagents integrated in a single cartridge
- Only 1 manual step
- Storage and shipment at room temperature

SAMPLE VERSATILITY

• For solid and liquid biopsy*



MULTIPLEXING CAPABILITY

- Detection of up to 52 relevant mutations in one cartridge
- Multiple genes and loci detection in one cartridge

└) FAST RESULTS

- Less than 2 minutes hands-on time
- Short turnaround time 40 to 150 minutes
- Access on demand no need for preprocessing or batching

ACCURATE RESULTS

- High sensitivity
- Highly standardized technology
- Contamination controlled-design

CONNECTIVITY

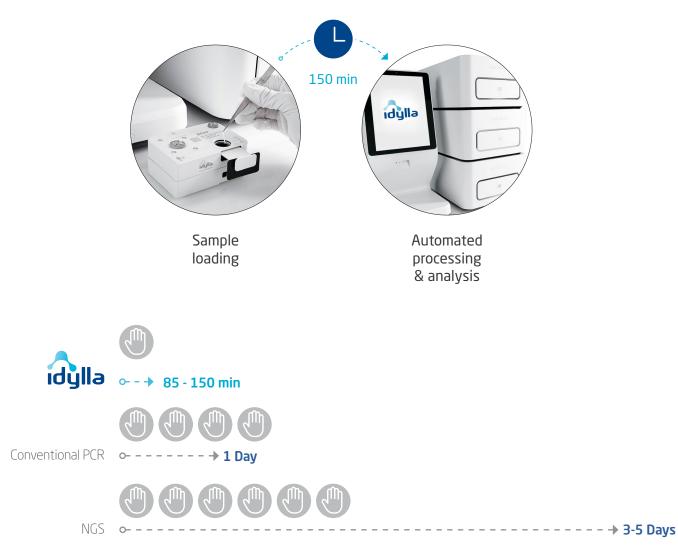
- Remote assistance, monitoring and upgrading
- Bi-directional LIS



The revolutionary Idylla[™] workflow

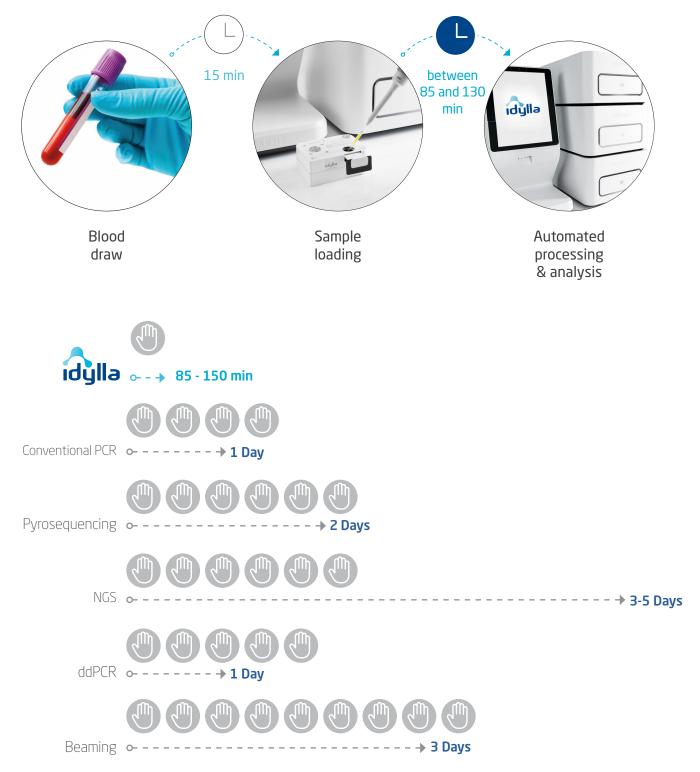
The Idylla[™] system in combination with the Idylla[™] Molecular Oncology Assays differs from other technologies in its outstanding **ease-of-use**, leading to an unsurpassed level of **standardization**, and its **short turnaround time**, allowing immediate access to therapy.

FFPE workflow



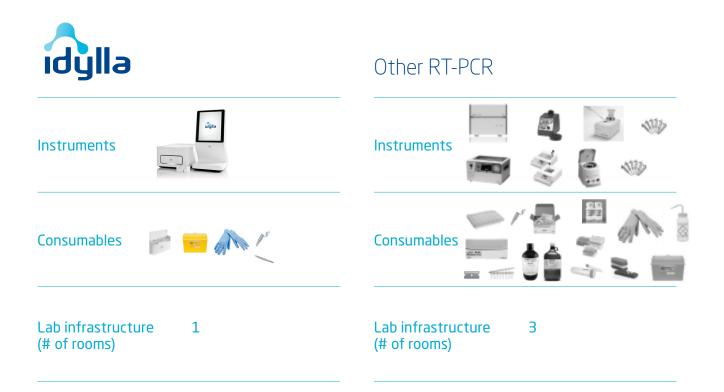


Liquid biopsy* workflow



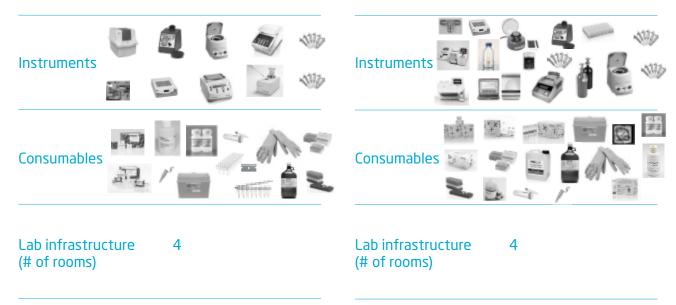
* Liquid biopsy currently available only for research applications

Instruments and consumables





Next generation sequencing





Current oncology assays



FFPE in - report out

Diagnostic products (CE IVD)

- Idylla[™] BRAF Mutation Test
- Idylla[™] KRAS Mutation Test
- Idylla™ NRAS-BRAF Mutation Test

Research products (RUO)

- Idylla[™] BRAF Mutation Assay
- Idylla[™] KRAS Mutation Assay
- Idylla[™] EGFR Mutation Assay
- Idylla[™] NRAS-BRAF-EGFR S492R Mutation Assay

Research products (RUO)

Plasma in - report out

- Idylla[™] ctBRAF Mutation Assay
- Idylla[™] ctKRAS Mutation Assay

Future oncology assay targets



FFPE in - report out

- NRAS
- MSI

Plasma in - report out

- ctNRAS-BRAF-EGFR S492R
- ctNRAS-BRAF
- ctEGFR



Idylla[™] BRAF mutation detection on solid and liquid biopsies

Activating mutations in the BRAF gene are observed in about 8% of all cancers⁷ and have been associated with sensitivity and resistance to a number of targeted anti-cancer therapeutics.

Cancers in which BRAF mutations are observed include: melanoma, colorectal cancer, thyroid cancer, lung cancer, hairy cell leukemia and ovarian cancer. BRAF testing is recommended in all patients with metastatic melanoma and metastatic colorectal cancer (mCRC). About 50% of all metastatic melanoma patients harbor mutations in the BRAF gene, making them eligible for BRAF or BRAF/MEK inhibitor therapy.⁸ In mCRC, BRAF mutation status should be assessed alongside the assessment of tumor RAS mutational status for prognostic assessment (the presence of a BRAF mutation indicates poor prognosis). The prevalence of BRAF in mCRC is about 8-15%.⁹



Prof. B. Neyns, M.D., Ph.D Medical Oncology, UZ Brussels, Belgium

"The ldylla[™] system has the potential to allow the start of targeted therapy within a time window of less than 24 hours following the diagnosis of metastasis, thereby saving precious time"



Idylla[™] EGFR mutation detection on solid biopsy

Activating mutations in the EGFR gene have been associated with sensitivity and resistance to a number of targeted anti-cancer therapeutics.¹⁷

EGFR mutations are mainly observed in lung cancer.

EGFR mutation testing is recommended in all patients with advanced non-small cell lung cancer (NSCLC) of a non-squamous subtype.

The prevalence of EGFR mutations in NSCLC adenocarcinomas is 10-15% of Western and up to 50% of Asian patients. Sensitizing EGFR mutations are predictive for response to EGFR tyrosine kinase inhibitors.^{11,17,21}

RESEARCH PRODUCT

Idylla™ EGFR Mutation Assay (RUO)

Research Use Only, not for diagnostic use



EGFR

Prof Giancarlo Troncone

University of Napoli Federico II, Naples

 "Today, EGFR testing is a cumbersome process and it often takes several weeks before results are analyzed.
 This may lead to the administration of anti-EGFR therapy as second-line agents, which is less efficient than their use in first-line therapy. The ldylla[™] EGFR Mutation assay technology has the potential to change that: it is a cost-effective solution, ensuring reliable and fast detection of all relevant mutations"



Idylla[™] KRAS mutation detection on solid and liquid biopsies

Activating mutations in the RAS genes are observed in 9-30% of all cancers and have been associated with sensitivity and resistance to a number of targeted anti-cancer therapeutics.¹² Cancers in which KRAS mutations are observed include: colorectal cancer, lung cancer and pancreatic cancer.

According to ESMO9, NCCN14, ASCO16 and CAP/AMP/ ASCO guidelines¹⁵, genotyping of clinically actionable mutations at a sensitivity of 5% in RAS genes exon 2 (codons 12 and 13), exon 3 (codons 59 and 61) and exon 4 (codons 117 and 146) is now mandatory on tumor tissue (either primary or metastasis) of all metastatic colorectal cancers, since the presence of these mutations correlate with the lack of response to

DIAGNOSTIC PRODUCT

Idylla^m KRAS Mutation Test (CE IVD)

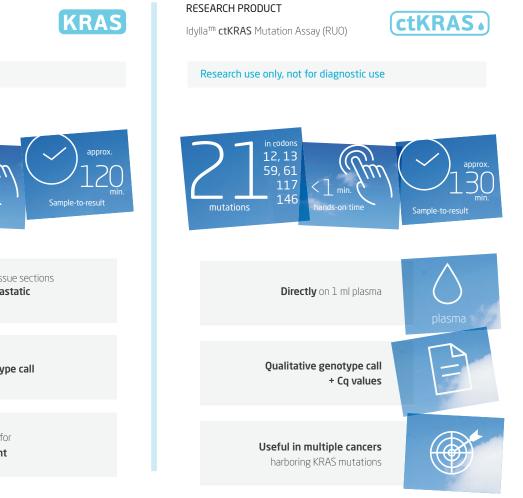
Diagnostic use

Image: Diagnostic use

certain EGFR antibody therapies⁹. About 46% of all metastatic colorectal tumors harbor mutations in exons 2, 3 and 4 of the KRAS gene.¹³

Several studies are ongoing to define the predictive impact of KRAS mutations on therapy decision for non-small-cell lung cancer patients^{18,19,20}. Currently there is evidence that KRAS in lung cancer has a prognostic value, indicating poor survival for patients with NSCLC, compared to the absence of KRAS mutations.¹¹

Using liquid biopsies for KRAS testing is minimally invasive, fast and easy to perform and provides an excellent solution to study the presence of KRAS mutations in different cancer types.



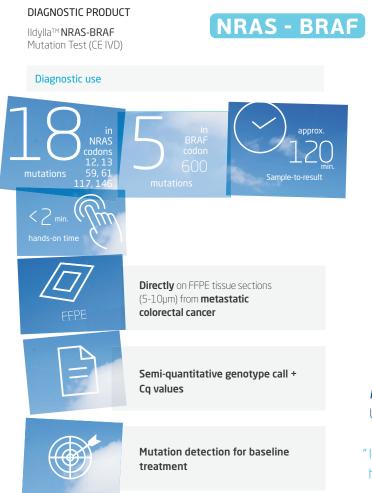
Beatriz Bellosillo

Laboratori de Biologia Molecular, Hospital del Mar, Barcelona " Idylla^{TT} allows very quick results with little hands-on time"

NRAS - BRAF

Idylla[™] NRAS mutation detection on solid biopsy

Activating mutations in the *RAS* genes are observed in 9-30% of all cancers and have been associated with sensitivity and resistance to a number of targeted anticancer therapeutics.¹² Cancers in which NRAS mutations are observed include: colorectal cancer and melanoma. According to ESMO⁹, NCCN¹⁴, ASCO¹⁶ and the CAP/AMP/ ASCO guidelines¹⁵, genotyping of clinically actionable mutations at a sensitivity of 5% in RAS genes exon 2 (codons 12 and 13), exon 3 (codons 59 and 61) and exon 4 (codons 117 and 146) is now mandatory on tumor tissue (either primary or metastasis) of all metastatic colorectal cancers, since the presence of these mutations correlate with the lack of response to certain EGFR antibody therapies⁹. About 5% of all metastatic colorectal tumors harbor mutations in exons 2, 3 and 4 of the NRAS gene.¹³ In metastatic colorectal cancer BRAF mutation status should be assessed alongside the assessment of tumor RAS mutational status for prognostic assessment (the presence of a BRAF mutation indicates poor prognosis). The prevalence of BRAF mutations in mCRC is about 8-15%.⁹ The IdyllaTM NRAS-BRAF-EGFR S492R Mutation Assay, for Research Use Only, detects 2 additional S492R mutations in the EGFR gene. Recent data suggest that the EGFR S492R mutation may develop as a mechanism of resistance, in about 16% of patients, as a result of certain anti-EGFR antibody therapies such as cetuximab.^{23,24} The IdyllaTM NRAS-BRAF-EGFR S492R Mutation Assay can be used for the study of emergence of such mutations.



Richard Colling University of Oxford, UK

" Idylla's unique fully automated and on-demand process has proven to be accurate, reliable and fast"

Idylla™ Connect Engage in the future



Advanced services to ensure continuity in your laboratory workflow

Automatic software updates

New releases of assay and console software are sent to your Idylla[™] console and can be installed with a single touch on the screen.



Immediate and remote service and support

ldylla[™] system parameters and error logs can be analyzed at anytime and anywhere to ensure swift actions and solutions.

More insight into your data with IdyllaTM Explore

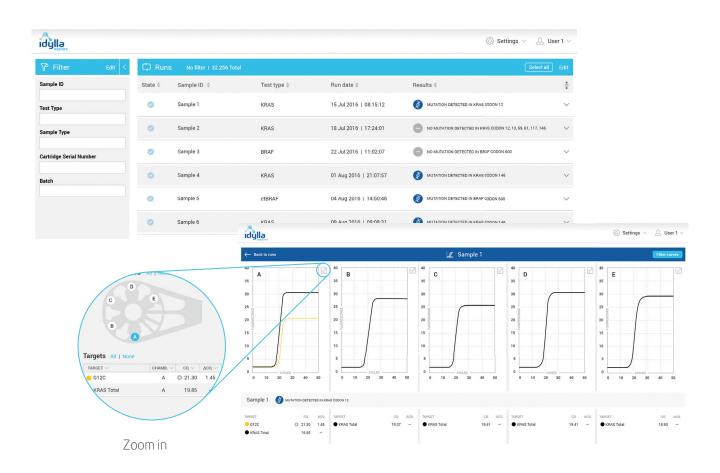
Get connected and enjoy the advantages of IdyllaTM Explore, a web-based application that allows you to analyze your data by providing

- Visualization of PCR curves from Idylla™Test Results
- Cq values per target
- Direct Access to Console result reports

UN SECURED NO DATAFLO

Idylla[™] Explore can be accessed anywhere and anytime from your PC or tablet through the following link: https://idyllaexplore.biocartis.com

Subscribe today and join the IdyllaTM Explore community by sending an email to explore@biocartis.com



Custom-made solutions Biocartis offers personalised solutions that fit your individual needs

- Create a network between different IdyllaTM User sites and share data and knowledge
- Direct access to your data for building your own solution
- Statistical analysis on your obtained data
- Monitoring: Follow-up of your data over time
- Disease surveillance or diagnostic grid: linking of real-time molecular diagnostic test data to geo-location and sample data





Join the investigation

There's a clear need for improved, standardized and fast diagnostics that allow faster initiation of targeted therapy for cancer patients.

IdyllaTM, Biocartis' fully automated molecular diagnostics system, is the first and only molecular diagnostic system that combines unsurpassed ease of use, speed and accuracy on multiple sample types. With its **compact, scalable design and outstanding ease of use**, IdyllaTM overcomes the traditional barriers of molecular diagnostics, allowing it to be used in virtually any laboratory setting. And by providing same-day-results, Idylla[™] enables physicians to make timely decisions on patients' therapy.

Idylla[™], the next level in disease interception.

REFERENCES

- Janku F et al. Oncotarget. 2015; 6(29): 26886–2689. 1
- 2.
- Sam SS et al. Pathol Res Pract. 2015, pii: jclinpath-2015–203345. Colling R et al. J Clin Pathol. 2015. pii: jclinpath-2015–203345. З.
- Bratzman SV et al. Expert Rev Mol Diagn. 2015; 15(6): 715–719
- 4. 5. 6. Siravegna G and Bardelli A. Genome Biol. 2014; 15(8): 449. Accès aux tests moléculaires EGFR, RAS et BRAF /Résultats d'une enquête dans 5 régions françaises, appui à la décision, INCa, janvier 2016
- 7 Mutations of the BRAF gene in human cancer. Helen Davies et al; Nature 2002, 417, 949-954
- 8. Clinical Practice Guidelines - Cutaneous melanoma: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Annals of Oncology 26 (Supplement 5): v126-v132.2015
- 9. ESMO consensus guidelines for the management of patients with metastatic colorectal cancer. Annals of Oncology 0: 1-37, 2016.
- NCCN Clinical Practice Guidelines in Oncology Melanoma Version 3.2016 NCCN Clinical Practice Guidelines in Oncology NSCLC Version 4.2016 10
- 11
- Adrienne D. Cox et al. Drugging the undruggable RAS: Mission Possible? Nature Reviews Drug Discovery Volume:13, Pages: 828-851 Year published: (2014) DOI-12. doi:10.1038/nrd4389
- 13. Jean-Yves Douillard, M.D., Ph.D., et al. Panitumumab-FOLFOX4 Treatment and RAS Mutations in Colorectal Cancer. N Engl J Med 2013;369:1023-34
- NCCN Clinical Practice Guidelines in Oncology Colon Cancer Version 2.2016 14
- http://www.amp.org/committees/clinical_practice/CRCOpenComment.cfm 15
- Allegra CJ. et al. Extended RAS gene mutation testing in metastatic Colorectal Carcinoma to predict response to antiepidermal growth factor receptor monoclonal 16. antibody therapy: American Society of Clinical Oncology Provisional Clinical Opinion Update 2015. Journal of Clinical Oncology 2016; 34(2):179-85 M. Reck et al. Metastatic non-small-cell lung cancer (NSCLC): ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Annals of Oncology, 2014 17.
- ESMO @ ECC 2015: Response to EGFR Agents in Combination With Chemotherapy Demonstrated in Patients with Metastatic Colorectal Cancer of Rare KRAS Molecular Subtype. http://www.esmo.org/Conferences/Past-Conferences/European-Cancer-Congress-2015/News/Response-to-EGFR-Agents-in-Combination-With-Chemother-18 apy-Demonstrated-in-Patients-with-Metastatic-Colorectal-Cancer-of-Rare-KRAS-Molecular-Subtype. Sept 2015.
- P A Janne et al. BJC 2015. Impact of KRAS codon subtypes from a randomised phase II trial of selumetinib plus docetaxel in KRAS mutant advanced non-small-cell lung cancer. 19 20 Alona Zer et al. | Thor Onco 2015. Pooled Analysis of the Prognostic and Predictive Value of KRAS Mutation Status and Mutation Subtype in Patients with NSCLC
- Treated with EGFR TKI's. Wendy A. Cooper et al. J Thorac Dis 2013; 5 (S5): S479-490. Molecular Biology of lung cancer. 21.
- 22. AACR 2016: 5-Year Survival Rates for Patients With Metastatic Melanoma Treated With Nivolumab Much Higher Than Historical Rates. http://www.ascopost.com/News/39500
- 23. Montagut C et al. Identification of a mutation in the extracellular domain of the Enidermal Growth Eactor Recentor conferring Cetuximab resistance in colorectal cancer. Nature Medicine 2012
- 24. Newhall K., Frequency of S492R Mutations in the Epidermal Growth Factor Receptor: Analysis of plasma DNA from Metastatic Colorectal Cancer Patients Treated with Panitumumab or Cetuximab Monotherapy. 16th World Congress on Gastrointestinal Cancer, Barcelona, Spain 2014.

NOTICE

Idylla™ BRAF Mutation Test

The MGB Probe contained in the BRAF Mutation Test is covered by applicable US patents and corresponding patents outside the US and is sold under a license from the ELITech Group. The purchase of this product includes a license to use only this amount of product solely for the purchaser's own use solely in the human in vitro diagnostic field (in accordance with applicable FDA and other regulatory requirements) and may not be used for any other commercial use, including without limitation repackaging or resale in any form (including resale by purchasers who are licensed to make and sell kits for use in the 5' Nuclease Process). No right under any other patent claim or for any other use is conveyed expressly, by implication, or by estoppel. Corresponding products conveying rights for use in all other fields may be obtained from Life Technologies under a separate catalog number. For information on obtaining additional rights, please contact outlicensing@lifetech.com or Out Licensing, Life Technologies Corporation, 5791 Van Allen Way, Carlsbad, California 92008

THE PURCHASE OF THE IDYLLATIM BRAF MUTATION TEST GRANTS THE PURCHASER RIGHTS UNDER CERTAIN ROCHE PATENTS TO USE IT SOLELY FOR PROVIDING HUMAN IN VITRO DIAGNOSTIC SERVICES. NO GENERAL PATENT OR OTHER LICENSE OF ANY KIND OTHER THAN THIS SPECIFIC RIGHT OF USE FROM PURCHASE IS GRANTED HEREBY.

Idylla[™] BRAF Mutation Assay and Idylla[™] ctBRAF Mutation Assay

The MGB Probe contained in the IdyllaTM BRAF Mutation Assay and in the IdyllaTM ctBRAF Mutation Assay is covered by applicable US patents and corresponding patents outside the US and is sold under a license from the ELITech Group. The purchase of this product includes a license to use only this amount of product solely for the purchaser's own research use and may not be used for any other commercial use, including without limitation repackaging or resale in any form (including resale by purchasers who are licensed to make and sell kits for use in the 5' Nuclease Process). No right under any other patent claim or for any other use is conveyed expressly, by implication, or by estoppel. Diagnostic use rights for MGB may be obtained under a separate license from ELItech. Corresponding products conveying commercial and diagnostic use rights for MGB may be obtained from LTC only under a separate agreement. For further information contact outlicensing@lifetech.com or Out Licensing, Life Technologies Corporation, 5791 Van Allen Way, Carlsbad, California 92008.

THE PURCHASE OF THE IDYLLATIM BRAF MUTATION ASSAY AND IDYLLATIM CTBRAF MUTATION ASSAY GRANTS THE PURCHASER RIGHTS UNDER CERTAIN ROCHE PAT-ENTS TO USE IT SOLELY FOR THE PURCHASER'S OWN RESEARCH USE. NO GENERAL PATENT OR OTHER LICENSE OF ANY KIND OTHER THAN THIS SPECIFIC RIGHT OF USE FROM PURCHASE IS GRANTED HEREBY.

Idylla™ KRAS Mutation Test, Idylla™ KRAS Mutation Assay and Idylla™ ctKRAS Mutation Assay

These assays contain PlexZyme and PlexPrime technology covered by patents granted and pending in certain jurisdictions, which are supplied under licence of SpeeDx Pty Ltd. PlexZyme and Plexprime are trademarks of SpeeDx Pty Ltd.

Idylla[™] NRAS-BRAF Mutation Test and Idylla[™] NRAS-BRAF-EGFR S492R Mutation Assay

The IdyllaTM NRAS-BRAF Mutation Test and the IdyllaTM NRAS-BRAF-EGFR S492R Mutation Assay contain PlexZyme and PlexPrime technology covered by patents granted and pending in certain jurisdictions, which are supplied under licence of SpeeDx Pty Ltd. PlexZyme and Plexprime are trademarks of SpeeDx Pty Ltd. The IdyllaTM NRAS-BRAF Mutation Test and the IdyllaTM NRAS-BRAF-EGFR S492R Mutation Assay contain Hilyte and QXL probes. QXL and Hilyte are licensed pursuant to an agreement with Eurogentec S.A., and these licensed probes can be used solely for the purchaser's own research use.

Hilyte[™] is a trademark of Anaspec, Inc. QXL[®] is a registered trademark of Anaspec, Inc.

Idylla[™] EGFR Mutation Assay

The Idylla^m EGFR Mutation Assay contains PlexZyme and PlexPrime technology covered by patents granted and pending in certain jurisdictions, which are supplied under licence of SpeeDx Pty Ltd. PlexZyme and Plexprime are trademarks of SpeeDx Pty Ltd.

IMPORTANT INFORMATION

ldyllaTM platform. IdyllaTM BRAF Mutation Test. IdyllaTM KRAS Mutation Test and IdyllaTM NRAS-BRAF Mutation Test are CE-marked IVDs in Europe. IdyllaTM BRAF Mutation Assay, Idylla^m ctBRAF Mutation Assay, Idylla^m KRAS Mutation Assay, Idylla^m ctKRAS Mutation Assay, Idylla^m NRAS-BRAF-EGFR S492R Mutation Assay, and Idylla^m EGFR Mutation Assay are available for Research Use Only, not for use in diagnostic procedures. Idylla^m ctKRAS Mutation Assay, Idylla^m ctKRAS Mutation Test, Idylla ctNRAS-BRAF-EGFR S492R Mutation Assay, Idylla^m EGFR Mutation Test, Idylla^m MSI Assay, Idylla^m NRAS Mutation Test, Idylla^m ctNRAS-BRAF Mutation Test, Idylla^m ctNRAS-BRAF Mutation Test, Idylla^m ctNRAS-BRAF Mutation Test, Idylla^m ctNRAS-BRAF. Idylla™ ctEGFR Mutation Assay are under development. Idylla™ is not yet for sale in USA and Canada.

COPYRIGHT INFORMATION

Biocartis trademark and logo are trademarks belonging to Biocartis and are used and registered in Europe. IdyllaTM is a registered trademark in the United States (US) and other countries. Idylla trademark and logo are used trademarks belonging to Biocartis.

Biocartis NV Generaal de Wittelaan 11 B3 2800 Mechelen - Belgium T +32 15 632 888

customerservice@biocartis.com www.biocartis.com

Ref: ONCO_AIO_201612



www.biocartis.com