Biomarkers

What you and your family need to know
About the GI Cancer Institute and the AGITG

The GI Cancer Institute is Australia’s only independent, non-government, non-profit organisation with the specific aim of raising awareness and funds to carry out clinical trials and research to test and improve treatments for gastro-intestinal (GI) cancers: a term for the group of cancers that affect the digestive system. This includes cancer of the oesophagus, stomach, liver, pancreas, gallbladder and biliary tract, large and small bowel, rectum and anus.

These trials are conducted by the Australasian Gastro-Intestinal Trials Group (AGITG), a multi-disciplinary collaborative group of medical and research professionals. Since 1991 this network of health professionals has been working to improve medical treatments for people with GI cancers.

This brochure provides information to help patients with metastatic colorectal cancer, as well as their families and friends, learn more about the role of biomarker testing and what this means for personalised treatment.

What is a biomarker?
Biomarkers, short for biological markers, are biological molecules, cells or genes found in blood, other body fluids or tumour tissue itself, that may be assessed to provide more information about a tumour.¹

Personalised cancer medicine is advancing²³
A diagnosis of secondary or metastatic colorectal cancer means the primary cancer has spread (metastasised) beyond the bowel (colon or rectum) into other parts of the body, such as the liver or lungs. A number of investigations are carried out before starting treatment for metastatic colorectal cancer to ensure patients receive the most appropriate treatment.
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Biomarker testing and treatment

Biomarker testing is an important tool used to personalise treatment

The aim of personalised medicine is to help doctors select the best treatment for each patient.(2,3) Steps can be taken to identify patients who may be more likely to benefit, or may be at greater risk of adverse effects, from one particular treatment compared to another 2,3.

Treatment for metastatic colorectal cancer can include surgery, radiotherapy, chemotherapy and/or targeted therapy6. Combination treatment with surgery, chemotherapy and/or targeted therapy has been successful in improving treatment outcomes in patients with a metastatic colorectal cancer 7.

Chemotherapy is a type of cancer treatment that works by killing the rapidly dividing cells that are found in cancer8. Chemotherapy can also affect other healthy fast-growing cells which causes some of the side effects of chemotherapy such as hair loss9.

A ‘targeted therapy’ is a type of cancer treatment that works by targeting specific cancer cell genes or proteins involved in cancer cell growth. Some targeted therapy may be used alone and some only in combination with chemotherapy5,7.

Radiotherapy uses radiation, such as x-rays, to kill or damage cancer cells to stop them from growing and multiplying. It is a localised treatment, which means it usually only affects the part of the body where the radiation is directed10.

How the biomarker test is used

The results of a biomarker test may1,11:

• Indicate normal or abnormal cell function
• Provide a general insight into how likely the cancer is to progress and cause harm (i.e., prognostic biomarker)
• Predict the likelihood of the cancer’s response to a specific treatment (i.e. predictive biomarker)
• Help the patient and their doctor make decisions about how best to treat their cancer

Testing can determine a patient’s biomarker status1,12

Taking a sample and testing colorectal cancer tissue can show if the tumour contains cells with certain genes that are normally functioning, known as ‘wild-type’ genes, or genes that have changed, ‘mutated’12.

16,398 Australians were diagnosed with colorectal cancer in 2019 (estimated)1
Patients with metastatic colorectal cancer

Biomarker Testing

Biomarker-Negative (Wild-type)

Biomarker-Positive (Mutant-type)

Knowing their biomarker status can help the patient and their doctor decide on the most appropriate treatment plan, and possibly provide some information about expected outcomes in general regardless of treatment.1,11

Some commonly tested biomarkers in colorectal cancer are RAS* (KRAS, NRAS) and BRAF.1 Biomarker test results will show if a patient's tumour has no mutations (RAS and BRAF wildtype) and one or more of these mutations (RAS mutant and/or BRAF mutant).

### Biomarker status

<table>
<thead>
<tr>
<th>RAS* genes including KRAS and NRAS.</th>
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<td><strong>RAS</strong>* is a family of genes that includes KRAS and NRAS. RAS biomarkers provide information to guide a patient's treatment and which therapies may or may not be appropriate.**</td>
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<tr>
<td><strong>About 50% of patients with metastatic colorectal cancer have RAS mutant tumours</strong></td>
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<tr>
<td><strong>About 50% of patients with metastatic colorectal cancer have RAS wild-type tumours</strong></td>
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<tr>
<td><strong>Patients with wild-type RAS genes in their tumours may be more likely to respond to certain treatments than those with mutated RAS genes in their tumours.</strong></td>
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*The RAS family of genes also includes HRAS: however mutations in HRAS are rarely found in metastatic colorectal cancer.*

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<th>BRAF gene. BRAF biomarkers provide information that has implications for treatment choice.</th>
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<td><strong>5-10% of patients with metastatic colorectal cancer have BRAF mutant tumours</strong></td>
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<tr>
<td><strong>90-95% of patients with metastatic colorectal cancer have BRAF wild-type tumours</strong></td>
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<tr>
<td><strong>Patients with metastatic colorectal cancer who have BRAF wild-type tumours have been shown to have better outcomes compared with patients with mutated BRAF tumours.</strong></td>
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What this means for you

Knowing your biomarker status may help you and your doctor make important disease management and treatment decisions.\(^{(6,14)}\)

The genetic makeup of each patient’s tumour is unique. Knowing your biomarker status — in this case the genetic properties of your tumour — may help you and your doctor select the most appropriate treatment.\(^{(1)}\)

For patients with metastatic colorectal cancer, testing for RAS biomarkers is reimbursed by the Medical Benefits Scheme.\(^{(15)}\)

When you’re diagnosed with metastatic colorectal cancer, you and your doctor want to get as much information as you can to make appropriate disease management decisions. It’s important to know your tumour biomarker status early, soon after the diagnosis of metastatic disease. When you understand your disease and how it affects your body, you can work with your doctor to plan your disease management.\(^{(1,11)}\)

As a patient with metastatic colorectal cancer, you and your caregivers are encouraged to keep an open dialogue with your doctors to keep up-to-date with genetic testing and what this means for your treatment.

**Discuss your biomarker status with your doctor**

1. Talk to your doctor about biomarker testing soon after your diagnosis of metastatic colorectal cancer so that you can make an informed decision regarding treatment.

2. Ask your doctor whether your tumour has been tested for biomarkers:
   - If YES: What is your status for each of these biomarkers?
   - If NO: Will your tumour be tested and when?

3. Ask your doctor how your biomarker status will affect your management.

**Summary**

1. Personalised medicine is advancing.\(^{(2,3)}\)

2. For patients with metastatic colorectal cancer, biomarker testing is an important tool that may be used to personalise treatment.\(^{(1)}\)

3. KRAS and NRAS are important biomarkers in metastatic colorectal cancer as they can predict whether a patient will respond to a particular treatment. BRAF may be important, as patients with a BRAF mutation may have a worse prognosis.\(^{(1)}\)

4. Knowing your biomarker status will help you and your doctor make important individualised decisions about the most appropriate treatment plan for you.\(^{(1,14)}\)
References:

Helpful Resources
GI Cancer Institute
gicancer.org.au
Cancer Council Australia
cancer.org.au
Cancer Australia
canceraustralia.gov.au
Cancer Council Online Community
cancercouncil.com.au/OC
CancerAid App
www.canceraid.com
Carer Gateway
carergateway.gov.au
Carers Australia
carersaustralia.com.au
Dietitians Association of Australia
daas.asn.au
healthdirect Australia
healthdirect.gov.au
beyondblue
beyondblue.org.au
Black Dog Institute
blackdoginstitute.com.au
Australia and New Zealand Gastric and Oesophageal Surgery Association
anzgosa.org
Gastroenterological Society of Australia
gesa.org.au
Pancare Foundation
pancare.org.au
Palliative care Australia
palliativecare.org.au
Funding the gap

GI cancers are amongst the least funded in Australia, compared to their impact in lives lost.

Pancreas, oesophagus, stomach and bowel cancer have all fared significantly worse in funding than other major cancers such as leukaemia, melanoma, breast and prostate cancers, when compared to the number of deaths they caused.2

“We need to raise community awareness of gastro-intestinal cancers and funding for research – to match their devastating burden of death and disease.”

Russell Conley,
Chief Executive Officer,
GI Cancer Institute & AGITG

To make an online donation go to gicancer.org.au/Donate or phone 1300 666 769

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100% of your donation goes to our research

I would like to make a one-off donation to GI cancer research

Please accept my one-off donation of:

☐ $30 ☐ $60 ☐ $100
☐ $250 ☐ $500

My choice $___________________________

I would like this donation to support the following clinical trials area: (please tick one only)

☐ Area of Greatest Need ☐ Oesophageal
☐ Stomach/ GIST ☐ Liver
☐ Gall Bladder/ Biliary Tract ☐ Pancreatic
☐ Bowel/ Colorectal/ Anal

I will make my donation by:

☐ Cheque enclosed made out to the GI Cancer Institute
☐ Credit card - please select
     ☐ MasterCard ☐ Visa ☐ Amex

Credit Card Number: ____________________________

Expires: ___/___

Cardholder’s Name: ____________________________

Signature: ___________________________________

Email: _______________________________________

Phone: _______________________________________

Mail: Locked Bag M250, Missenden Road NSW 2050

A gift in your Will can help change the lives of those with GI cancer beyond your lifetime.

☐ Yes, I would like to learn more about how I can make a gift to the GI Cancer Institute in my Will.
☐ I have included the GI Cancer Institute in my Will.

Thank you for your support

Our Privacy Policy is available on our website www.gicancer.org.au and contains further details about: (i) how we obtain, store and use the personal information we collect; (ii) where we send it; (iii) how you can access and correct it; (iv) how you can lodge a privacy complaint; (v) how we handle those complaints. You may contact our privacy officer with any queries via email: info@gicancer.org.au, or mail: PO Box M250 Missenden Road NSW 2050 or telephone: 1300 666 769.