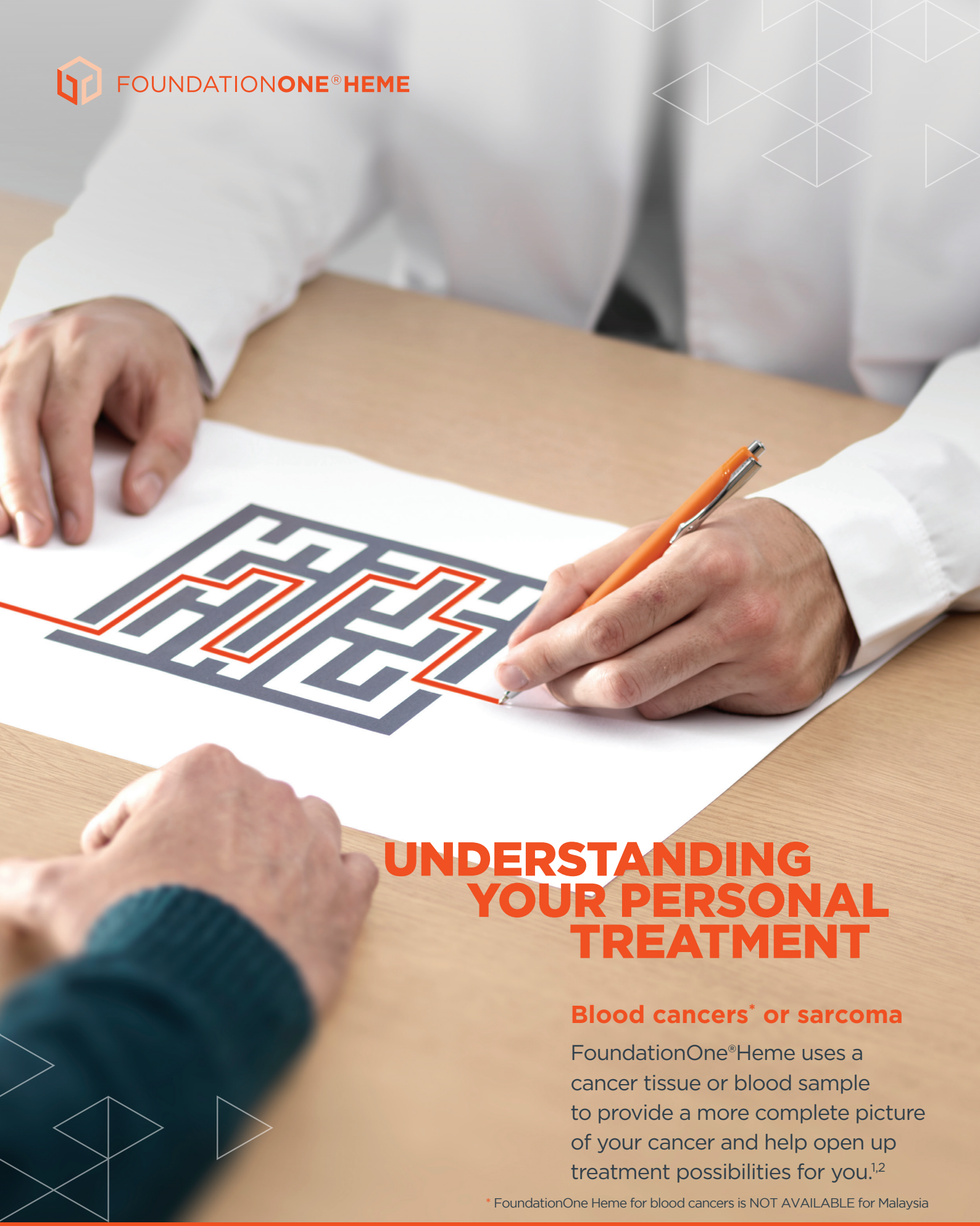
FOUNDATIONONE® HEME



UNDERSTANDING YOUR PERSONAL TREATMENT

Blood cancers* or sarcoma

FoundationOne®Heme uses a cancer tissue or blood sample to provide a more complete picture of your cancer and help open up treatment possibilities for you.[1,2]

* FoundationOne Heme for blood cancers is NOT AVAILABLE for Malaysia

See more, do more

FOUNDATION MEDICINE®

Roche

Cancer occurs due to mutations affecting the way your cells work and grow[3,4]

What causes cancer?

HEALTHY CELL WITH NORMAL DNA AND RNA

DNA and RNA make up the genes within your cells and contain the genomic information needed for your body to work correctly.[5,6] RNA translates genes from DNA to allow cells to make proteins when they are needed. Proteins are essential for normal cell function[6–9]

CHANGED (MUTATED) DNA OR RNA

When your cells divide, the DNA is copied and translated into RNA to make proteins. Together, proteins and RNA control the activities of the cell like what it does and when it divides. Sometimes an error can occur during this process. These errors are called mutations[4,6,10]

CANCER CELL

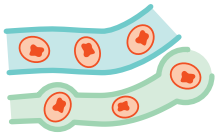
UNCONTROLLED CELL GROWTH

Mutations may affect the way your cells work and cause uncontrolled cell growth. These cells may become cancer cells[6]

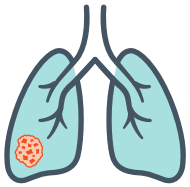
MALIGNANT TUMOUR

Cancer cells can ultimately form a malignant tumour (a mass of cancer cells that may invade nearby tissues).[6] Changes in RNA can also affect cell function, and lead to cancer[7,8]

CANCER CELLS ENTER BLOOD VESSELS OR LYMPHATIC SYSTEM



METASTASES: CANCER CELLS FORM SECONDARY TUMOURS IN OTHER LOCATIONS



If cancer cells enter the blood vessels or the lymphatic system, they spread to other locations within the body and can form tumours (metastases)[11,12]

Each person's cancer has unique mutations that might respond better to certain treatments[13–18]

Due to advances in scientific and medical research, we now understand more about the mutations causing cancer. It is now known that even if you have the same type of cancer as someone else (e.g. sarcoma), your mutations may differ and you may need different treatment. Conversely, even if your primary cancer is a different type, the mutations can be the same. You may then benefit from a similar treatment.[19]

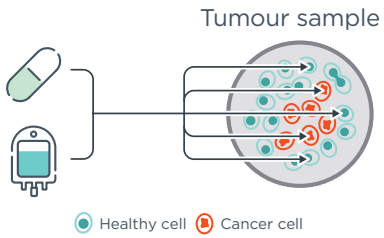
Knowing the mutations in your cancer can help you and your doctor understand your treatment options and may help to personalise your treatment[13–18,20]

What are targeted therapies and personalised treatments?

There are several different treatment options, including surgery, radiotherapy, chemotherapy, targeted therapy and immunotherapy.[21]

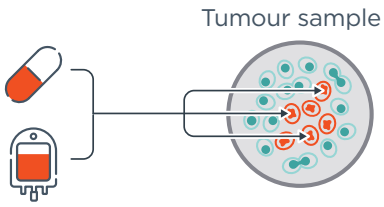
Targeted therapies are able to target cancer cell with specific mutations. These are different from non-targeted therapies, such as chemotherapies, which act on any type of fast-growing cells, whether cancerous or healthy.[22,23] Immunotherapy is a type of targeted therapy that uses the body's immune system to fight cancer.[24] A biomarker is a sign or marker of how a cell is behaving. It might indicate a type of disease or help to predict how the cell will react to certain treatments.[25] If a tumour has a specific biomarker, targeted therapies may be used against this biomarker. By testing your tumour sample, your doctor can consider this information for identifying the most appropriate treatment approach for your cancer.

NON-TARGETED THERAPIES



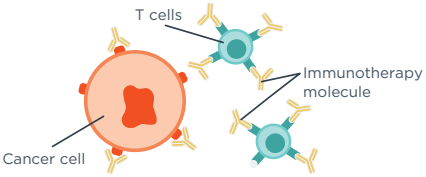
Target any fast-growing cells like cancer, but also cells such as those in your bone marrow, reproductive system, mouth lining and hair follicles.[22,26]

TARGETED THERAPIES



Target cancer cells that only contain certain specific cancer-related mutations.[23]

IMMUNOTHERAPIES

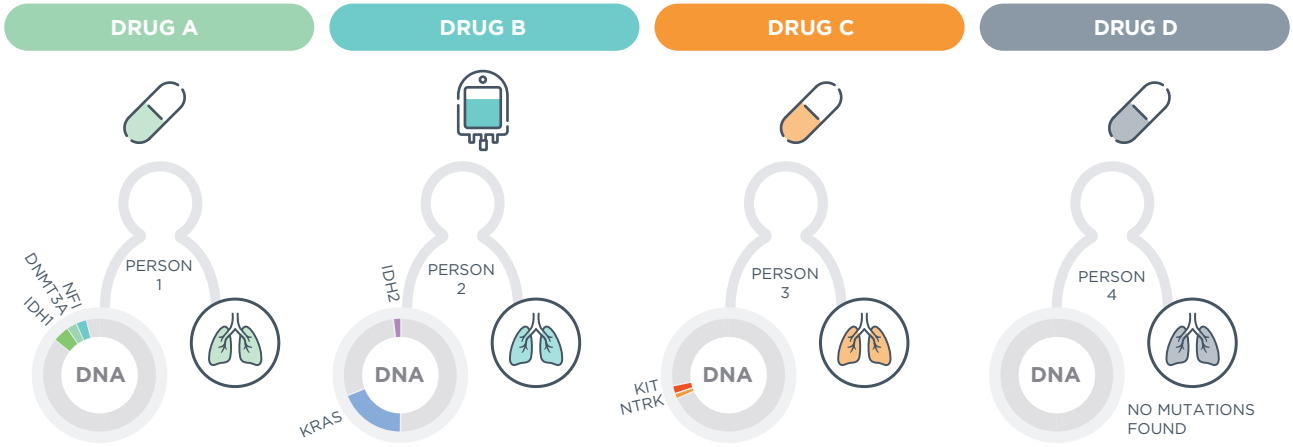


Activate or imitate your immune system to target cancer cells.[24]

How can knowing your cancer's mutations help your treatment plan?

If certain mutations are found in your cancer cells, your doctor may be able to give you a more precise treatment, such as a targeted therapy or immunotherapy, based on this finding. There might be cases where no relevant mutation is found or no targeted treatment option is available for the mutation that has been identified. This is also valuable information to support further treatment planning.[1,2,13–17,20]

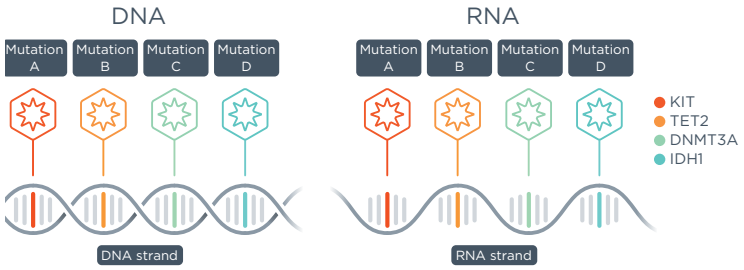
Precision medicine increases the likelihood you will find a targeted therapy, which improves your chance of responding well.[27]



There are several cancer testing methods available, which search for mutations in your cancer cells

Genomic testing encompasses single biomarker testing, hotspot testing and comprehensive genomic profiling. They all test your cancer sample for mutations.

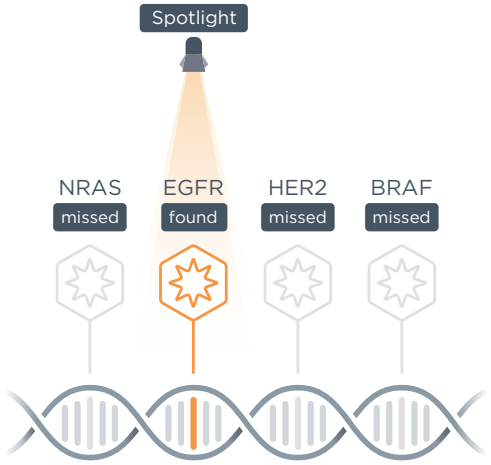
For example, this cancer cell has four mutations. They are carried on the DNA and can be seen in the corresponding RNA.



How do single biomarker tests or hotspot tests work?

Single biomarker testing or hotspot testing only looks for predefined individual mutations within limited regions on your cancer cells' DNA or RNA. These mutations are always chosen before testing starts. **So, if you do not choose to look for a mutation, you will not find it.**[28,29]

Single biomarker testing or hotspot testing



Compared with other tests, comprehensive genomic profiling can find more cancer-driving mutations important for your treatment plan.[1,2]

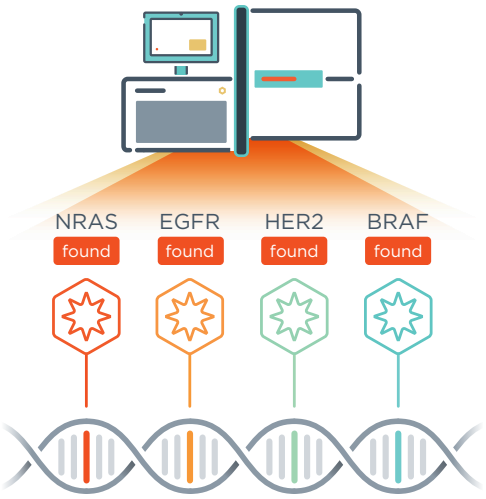
What makes comprehensive genomic profiling different?

Comprehensive genomic profiling provides a more complete picture of your cancer by searching for multiple mutations across a broad region of your cancer cells' **DNA and/or RNA**.

Comprehensive genomic profiling looks at **all potential mutations** that may drive your cancer, even if these are very rare, in a single test.

This **increases your chances of finding important mutations right away.** This may also increase the chance of finding a more precise treatment for you.[1,2]

Comprehensive genomic profiling



Foundation Medicine®'s comprehensive genomic profiling may improve your chance of finding a personalised treatment.

Which Roche Foundation Medicine service may be suitable for you?

Foundation Medicine offers a high-quality portfolio of comprehensive genomic profiling services[1,2,30–33]

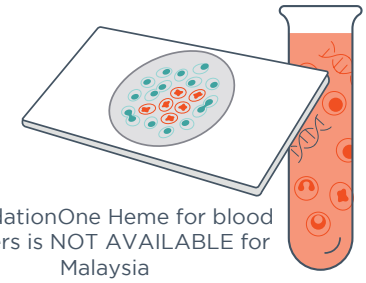
Foundation Medicine offers comprehensive genomic profiling services that can help you and your doctor better understand your treatment options. There are different tests available for patients with different types of cancer. FoundationOne Heme is for patients with sarcomas and blood cancers, such as leukaemia.[2] FoundationOne®CDx and FoundationOne®Liquid CDx are for patients with all types of solid tumour, e.g. lung, prostate or breast cancer.[30,31]

Discuss with your doctor whether FoundationOne Heme is recommended for your cancer and which sample type is suitable

FOUNDATIONONE®HEME

Blood cancers

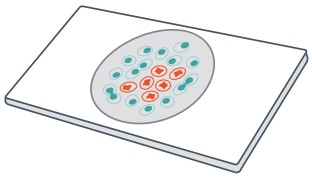
Uses a tissue sample or blood sample



FoundationOne Heme for blood cancers is NOT AVAILABLE for Malaysia

Sarcomas

Uses a tissue sample



Tissue biopsy

Your doctor will take a small sample of tissue from your cancer site using a needle, surgery, bone marrow biopsy or endoscopy. They will preserve this sample and will use it to run the comprehensive genomic profiling test.[34–36]

Why is it important to search for mutations in your cancer?

If certain mutations are found in your cancer cells, your doctor may be able to give you a more precise and personalised treatment based on this finding.[1,2,15,38]

FoundationOne Heme searches for multiple common and rare mutations in your cancer cells. This can help you and your doctor optimise and personalise your treatment plan.[1,2,15,39,40]

FoundationOne Heme can help your doctor diagnose your sarcoma subtype and guide your treatment plan.[2,15,16,18,41] It may help open up new treatment possibilities, including therapies and clinical trials.[1,2]

What if you've already had a test?

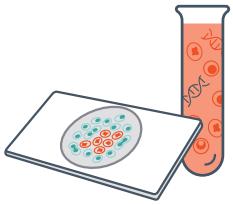
FoundationOne Heme can find more mutations than other tests because it searches for multiple mutations across a broad region of DNA and RNA. So even if you've already had a test, or already received some treatment, it might be beneficial to test your cancer again.[1,42]

Your care team will send your tissue sample to Foundation Medicine laboratory in the United States where it undergoes thorough analysis

A team of experts analyses your sample and creates a comprehensive report based on your cancer's mutations

What happens to your sample?

TUMOUR SAMPLE (TISSUE SAMPLE) → **COMPREHENSIVE GENOMIC PROFILING** → **DATA ANALYSIS** → **FOUNDATION MEDICINE REPORT**



Your care team will send your tissue or blood sample to Foundation Medicine laboratory in the United States where it undergoes thorough analysis.

For FoundationOne Heme, both DNA and RNA are extracted from your sample and searched for mutations possibly responsible for your cancer.[1,2]

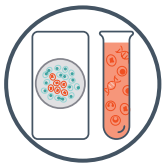
Mutations found are evaluated by cancer experts and an analytical algorithm process that is being constantly updated for treatment options, such as targeted therapies or immunotherapies or relevant clinical trials, using a large cancer information database.[38,43]

Your care team will receive a comprehensive report, including the details of your tumour profile, less than **21 days** after receipt of the sample at the laboratory.[2,38]

The Foundation Medicine information database is continuously updated based on new research, clinical trials and increasing numbers of patient genomic profiles from clinical routine (depending on your consent).[43] This helps to ensure that when a Foundation Medicine report is created, it is based on the latest scientific data.

How to order?

Your doctor orders the test.



Your doctor will arrange for your tissue sample to be collected.

Your sample is sent to the Foundation Medicine laboratory in United States

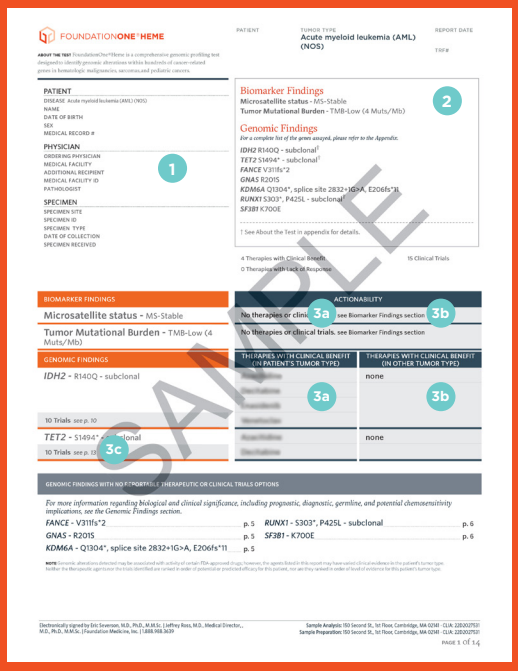
DNA and RNA is extracted from your sample and analysed.

Your doctor receives the report.

Please note: All patient data are pseudonymized, stored securely and may be used to help researchers improve cancer care provided you have given your consent for the processing of your personal data for research and scientific purposes. Access to your data processed for research or clinical purposes will depend on your consent and applicable data protection laws. For more information about data privacy, please see the Patient Consent Form or talk to your doctors.

The FoundationOne Heme report may help guide your treatment plan[38]

Page 1 of an example FoundationOne Heme report[38]



Page 1 provides a summary of your results, while the remaining pages give more details.

1. Your details, your doctor's details and information about your specimen (the cancer tissue sample that was analysed)
2. Biomarker findings and genomic findings: A summary of mutations and other characteristics found in your cancer to help understand which targeted therapies, immunotherapies or clinical trials may be relevant to you. Sometimes no mutations can be found. This information will still be helpful to your doctor, as it may help to rule out therapies that are unlikely to help you
3. Depending on current scientific knowledge and your cancer's mutations, the Foundation Medicine report may indicate:
   - a. Approved therapies according to the respective blood cancer type
   - b. Therapies approved in another cancer type
   - c. Clinical trials for you and your doctor to discuss together

More accurate diagnosis[1,2,15,16,18,40,44,45]

Clearer prognosis[1,2,13,14,18–20,46,47]

Opens up new treatment option[1,2,13–16,20,48,49]

Important considerations about your results

- Sometimes the test can't be performed due to inadequate sample
- Sometimes no mutations can be found
- If a mutation is found, several factors affect if there will be therapies or clinical trials available
- The test cannot predict how your cancer will respond to therapy

Discuss the next steps for your personalised treatment plan with your doctor.

For more information on cancer testing and Foundation Medicine's comprehensive genomic profiling services, please ask your care team.

Molecular insights leader Foundation Medicine has joined the Roche Group as part of our long-standing commitment to pioneering progress in precision medicine[50]

About Roche and Foundation Medicine

Roche and Foundation Medicine are collaborating to bring Foundation Medicine comprehensive genomic profiling services to cancer patients around the world.

Foundation Medicine is a world-leading molecular insights company and innovator in the field of comprehensive genomic profiling.

As part of a long-standing commitment to pioneering progress in precision medicine, Foundation Medicine has joined the Roche Group, a global healthcare company leading in cancer treatments and personalised healthcare.[50]

Glossary

Biomarker	A molecule that is a sign of a normal or abnormal process, or of a condition or disease. A biomarker may be used to see how well the body responds to a treatment for a disease or condition.[25]
Biopsy	The removal of cells or tissues for examination by a pathologist.[51]
Blood cancer	Cancer that begins in the bone marrow or in the immune system where blood is made. Examples of blood cancer include leukaemia, lymphoma and multiple myeloma.[52]
Cells	The basic building blocks of all living things.[53]
Chemotherapy	Treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or by stopping them from dividing.[54]
Clinical trials	Research studies that use human volunteers to test new drugs or other treatments to find out whether they are better than the current, standard treatment. Before giving the treatment to people, it is studied by scientists. If these studies suggest it will work, the next step is to test it in patients.[55]
Comprehensive genomic profiling	A next-generation sequencing approach, able to detect many mutations to help you and your doctor to make treatment decisions personalised to you.[1]
DNA	The genetic 'blueprint' found in the nucleus (centre) of each cell. DNA holds genetic information on cell growth, division and function.[5]
Gene	A section of DNA that contains the information to control the development of one or more of a person's traits. A gene can be passed from parent to offspring.[56,57]
Gene fusion	Parts of two genes joined together that can produce cancer-causing proteins. Gene fusions can be seen in certain kinds of cancer, including leukaemia.[58]
Immunotherapies	Treatments that use the body's immune system to fight cancer.[24]
Malignant tumour	A mass of cancer cells that may invade nearby tissues or spread (metastasise) to distant areas of the body.[59]
Mutation	A change in the DNA of a cell. All types of cancer are thought to be due to mutations that damage a cell's DNA.[4]
Radiotherapy	The use of high-energy radiation from X-rays, gamma rays, neutrons, protons and other sources to kill cancer cells and shrink tumours.[60]
RNA	A segment of genetic code found in all cells that stores and carries messages within the cell to affect cell functioning.[9]
Sarcoma	A type of cancer that begins in bone or soft tissues of the body. Types of sarcoma are categorised based on where they start; for example, cartilage, fat, muscle, blood vessels, fibrous tissue, or other connective or supportive tissue.[61]
Solid tumour	An abnormal mass of tissue that usually does not contain cysts or liquid areas, e.g. lung or breast cancer. Cancers of the blood (leukaemias) generally do not form solid cancers.[62]
Targeted therapy	Treatment that attacks some part of cancer cells that makes them different from normal cells. Targeted therapies tend to have different side effects to chemotherapy drugs with broader action.[63,64]

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