Multiple Myeloma in Ireland

What is MM?

What is MM research?

Why should I get involved?

How can I get involved?

RCSI

HRB Health Research Board

HRCI Health Research Charities Ireland

breakthrough CANCER RESEARCH

PPI IGNITE NETWORK

BEAUMONT RCSI CANCER CENTRE

What is Multiple Myeloma?

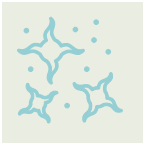
Multiple myeloma (MM) is a blood cancer that develops in the bone marrow. Many people have heard of other blood cancers like leukaemia and lymphoma, but MM is less well-known. Despite this, it is the **second most-commonly diagnosed** blood cancer, and lots of patients in Ireland are living with this disease. MM is mostly diagnosed in patients over 65, but about 20% of patients are under the age of 60. Although many new treatments have been developed in recent years, it is not yet considered curable.

What causes MM?

HOW DOES IT DEVELOP?

MM starts in the **bone marrow**, which is where our body produces all of the cells that make up our blood. Cells are billions of tiny living units that carry out different important jobs in the body. In the case of the blood, there are 3 main types of cells found there: some carry oxygen around the body to give us energy (red blood cells), others form clots to stop us losing too much blood if we get a bad cut (platelets), and yet more cells fight off invaders like bacteria or viruses if we get an infection (white blood cells, also called immune cells).

red blood cells



platelets

white blood cells

Usually, our bodies are very good at balancing the number of cells we have, so that old ones die off and are replaced by whatever number of new cells we need. If this balance goes out of sync, and cells don't die off when they should, cancer can develop. In the case of MM, a certain type of cancerous immune cell called a plasma cell builds up on the bone marrow and as a result normal healthy cells are crowded out. The job that plasma cells normally do is to fight off infections, because they produce special proteins called **antibodies** that attach to invading bacteria or viruses and stop them causing problems. However, having too many cancerous plasma cells means that the immune system cannot work properly, and infections are a big problem for MM patients.

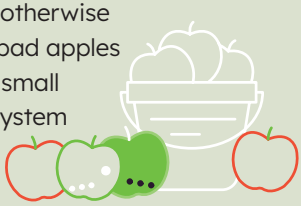
Think of the bone marrow as a garden of different blood cells. Let's say the red blood cells are roses, the platelets are sunflowers, and the cancerous plasma cells are weeds. Initially there is a balance of all the flowers, but in MM patients, the unwanted weeds overgrow until they have taken over all the available space in the garden. When this happens, the bone marrow cannot do its job properly, and people feel unwell or get infections.

PROGRESSIVE STAGES

The progression of MM can vary from person to person, but generally, the disease progresses through three stages: **MGUS**, **SMM**, and **Symptomatic MM**.

MGUS *is the* earliest stage.
It is short for Monoclonal Gammopathy of Undetermined Significance. Here, we see abnormal proteins in the blood or urine, but a patient may not even know that anything is wrong.

It's like having a few bad apples in an otherwise healthy basket of fruit. Just like a few bad apples won't spoil the whole basket, having a small number of abnormal markers in your system won't necessarily cause problems.



In fact most patients with MGUS will never develop any problems and will never develop MM. Studies have shown that the chances of MGUS progressing to symptomatic MM are quite low. Only about 1% of people with MGUS progress to symptomatic MM each year.

SMM *is the* next stage.
It stands for Smouldering Multiple Myeloma. This is where plasma cell numbers are higher than in MGUS, but lower than in a patient with MM. Patients with SMM do not have symptoms such as infections, low blood counts or bone problems. Doctors will monitor these patients closely for any signs that they are progressing to full-blown MM using blood tests and sometimes scans. They may suggest interventions or treatments to help manage your condition such as clinical trials. About 10% of people progress from SMM to symptomatic MM.

Symptomatic MM *is* full form *of the* disease.
This stage is like a weed that has spread out of control and is damaging the garden. The cancer cells have multiplied at this point and can cause a variety of symptoms. The gardeners in this analogy will be your healthcare team, with whom you can work to maintain your overall health, and treat the disease so that the weeds die off and the normal roses and sunflowers grow back.

MM Symptoms

Symptoms vary a lot between patients but can include:

fatigue

bone pain ~ *which may manifest as back pain*

infections ~ *can be different types like chest infections, urine infections etc*

weight loss

high calcium levels ~ *leading to excessive thirst, constipation and confusion*

Is MM treatable?

YES, MM is treatable, *but it is not currently curable.*

Many new MM drugs have been approved by regulatory bodies in the last two decades and research is ongoing for many others.

TREATMENTS CURRENTLY USED

Customized treatment plans consider the unique needs and preferences of the patient. There are many treatments that can help to manage the symptoms and slow the progression of the disease. Many new treatments have been developed in recent years but not all of these are available in Ireland. With the right treatment, MM patients can live for several years and have a good quality of life. **Patients might expect to receive one or more of the following treatments to manage their symptoms, keep the cancer in check and enhance their quality of life:**

Chemotherapy
Using medicines to directly kill cancer cells

Stem cell transplant
High-dose chemotherapy is first used to kill cancer cells. Soon after, healthy stem cells are transplanted into a patient to replace healthy cells that were also killed by the chemotherapy.

Radiation therapy
Using high-energy radiation to kill cancer cells.

Supportive care
Using medications and other treatments, such as blood transfusions and pain medication to manage the symptoms and complications of MM

Bone-strengthening drugs
Used to prevent bone fractures

Immunotherapy
Using the patient's own immune system to attack cancer cells

As MM is a **progressive** condition, cancer cells may become more aggressive, and treatments don't work as well. This is called r**efractory disease**, and your doctor may suggest using a different medicine. This is called "second-line therapy". Having more second- and third-line therapies would be very helpful in treating refractory disease.

How do we create more therapies?

While providing quality care and effective first-line treatments for MM patients is crucial, it is also crucial to invest in research to improve our understanding of the disease and to help develop **new** and **innovative therapies**. This will ensure that patients with advanced stages of MM do not "run out of treatments". This is the reason that other cancers are curable, and in the future research in MM hopes to achieve this also.

What is research?

Because MM is not yet curable, doctors and scientists need to carry out research to learn more about its causes and how it progresses, in addition to finding and testing new therapies. Studying the biology of MM cells in the lab, developing and testing new therapies to progress into clinical trials, and identifying risk factors and patterns for how the disease develops or progresses are all important forms of research going on worldwide.

Why is research important?

MM research is crucial for many reasons. ***Firstly***, MM is a serious condition that has profound effects on patients and their families. The burden of the disease can be lessened, and patient outcomes improved, with research into disease mechanisms and more effective treatments. ***Secondly***, MM is a complicated disease with numerous forms. Its' biology must be studied to find new treatment targets and to help predict which therapies will work best in individual patients. Insights from research on MM may also aid in the development of new therapies for other cancers.

Why should patients get involved?

MM researchers can grow MM cells in labs to study disease biology and to begin the process of developing new medicines. These are what we call “cell lines”. Think of them as little test subjects that scientists can use to learn more about how cells work, and how they respond to different treatments. However, each cell line is derived from a single person’s blood and grown for years under artificial conditions, so they are not perfect as a model.

Therefore, the best option for doing meaningful research is to use MM cells donated by patients when they are getting bone marrow biopsies. A bone marrow biopsy (aspirate) is something your doctor will take as part of your diagnosis or maintenance treatments when you are attending hospital appointments.

If there are abnormal plasma cells in the bone marrow aspirate, this, in combination with other clinical results, is used by your doctor to make a diagnosis. Researchers might also use these cells for several different reasons:

1. **To learn more about the biology of the disease**: MM is complicated as there are many different ways the disease can progress. Researchers can learn more about the biology of the illness, including the genetic and biological changes that take place in MM cells, by studying bone marrow cells taken from patients.
2. **To develop new treatments:** Studying bone marrow cells from patients can assist researchers in finding novel drug targets and developing new MM therapies. Researchers can learn which medications might be effective in different stages of the disease by examining how they affect MM cells from specific patients.
3. **Precision medicine**: MM can differ significantly between individual patients. Using patient-derived bone marrow cells, researchers can create treatment plans that consider each patient's unique features.

Overall, patient-derived materials such as bone marrow aspirates are essential for meaningful MM research. They provide a window into the biology of the disease and help researchers develop new treatments.

CRUCIAL TIME-POINTS FOR RESEARCHERS

If your doctor suspects that you may have MM, based on routine blood tests, they will order a diagnostic bone marrow biopsy. Firstly, your biopsy can be used to determine the number and percentage of normal vs. cancerous plasma cells in the bone marrow. Secondly, it will confirm or deny a diagnosis of MM.

Your **diagnostic bone marrow biopsy** is one of the most precious samples for MM researchers.

Asides from your diagnostic bone marrow biopsy, there is immense value in your **Day-100 biopsy** (100 days after a Stem Cell Transplant), and a biopsy if your condition **relapses**.

You will never be asked to have a bone marrow biopsy done outside of your standard care treatment plan, so you are not having unnecessary procedures. Any research you consent to will use samples taken at the same time.

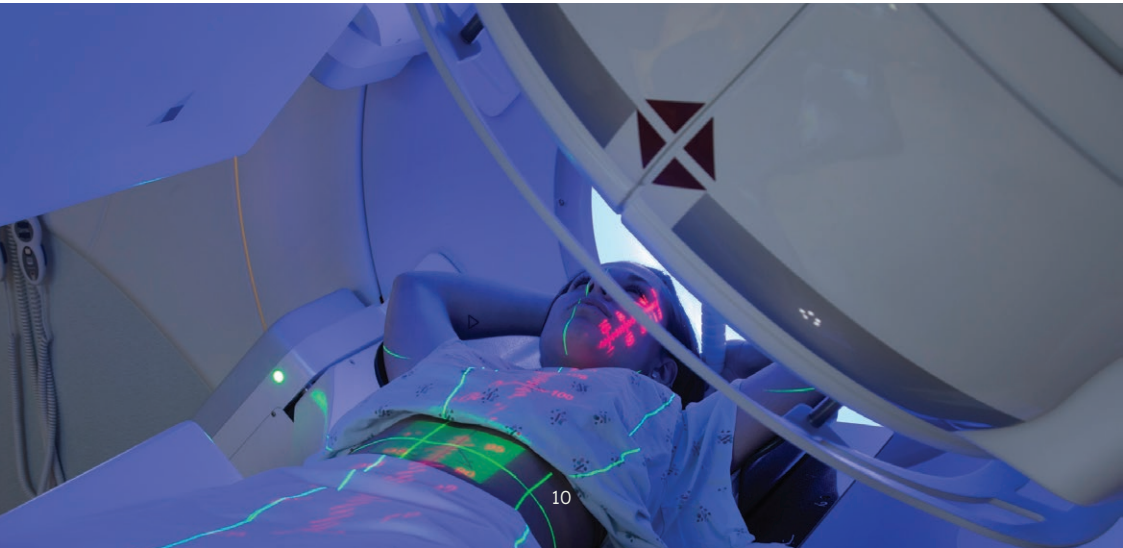
What is cutting edge research?

Cutting edge is something the scientific community talks about a lot. All it means is exploring the unknown, trying new things, and discovering new knowledge to better understand something important.

In the context of MM, some of the most promising areas of research include **targeted therapies** (which aim to attack cancer cells more precisely), immunotherapies (which harness the power of the body's immune system to fight back at cancer), and **genetic testing** (through "Next Generation Sequencing", or NGS, which can help doctors determine the most effective treatments for every patient they see).

There is a real push for researchers to explore new ways to diagnose and monitor MM. Researchers are attempting to identify which MM patients are more likely to experience a worsening of their cancer or a poor response to treatment. Examining the genetic make-up of a patient's cancer cells, using cutting-edge imaging tests to track disease activity, and finding particular markers in the blood or urine that can help predict disease progression or treatment response are a few of the things researchers look at.

By utilizing these tools, medical professionals hope to be better able to identify which patients might benefit from more aggressive treatments, and tailor their care to individual patient requirements. Overall, these advances hold great promise for improving the outlook and quality of life for MM patients.



WHAT IS "NEXT GENERATION SEQUENCING (NGS)?"

It's certainly cutting edge! Sequencing is like reading a book, letter-by-letter as opposed to word-by-word. However, this book is written in a special language (genetic code) that contains instructions on how to build and operate living things. Just like each word in a book is made up of letters, the "words" in this language (genes) are made up of four chemicals (called bases) that scientists can "read" using special machines. By "reading" this genetic code, scientists can learn how different living things are built and how they work, so that this knowledge can be used to help treat diseases like cancer.

Through NGS, researchers can identify what changes occur in the genes of cancer cells that make them different from normal cells. This helps scientists learn more about the causes of MM and find new ways to treat it.

Additionally, these details can be used by doctors to develop treatments tailored to a patient's individual needs. Sequencing can also be used to track disease progression and to identify any genetic misspellings that might reduce the effectiveness of treatment. Altogether, this means that sequencing aids doctors in selecting the most appropriate treatments for every patient, and in finding alternative ones if the treatments stop working.

PROGRESSION THROUGH TIME

While NGS holds great promise for improving our knowledge of MM and creating novel, more effective therapies; it's important to bear in mind that there is also huge value in going back in time and examining older pre-stored samples. The insights researchers get from older samples helps researchers understand how MM progesses over time, and can guide the development of new treatments and diagnostic tests.

But how do researchers get these older pre-stored samples? This is via a process called **biobanking**. In biobanking, clinicians and researchers seek special permission to store blood or tissue samples that are considered important for medical research. A biobank, similar to how a bank keeps your money safe and organized, keeps biological samples safe and organised. A patient will always be asked for consent when providing a sample, and researchers can learn a lot of valuable information about MM and its treatment if they study enough samples in a biobank. If a biobank contains samples from patients at different stages of the disease, researchers can track what happens to MM cells over time in one patient, or in the population!

Finally, biobanking provides a valuable resource for testing new treatments for MM. By using biobanked patient samples to test the effectiveness of new drugs and therapies, researchers can accelerate the development of new treatments and improve outcomes for patients. More is better when testing on patient samples!

MM Research in Ireland

There is a lot of cutting-edge MM research going on all across Ireland, some here:

BEAUMONT RCSI CANCER CENTRE, DUBLIN:

Detecting the disease

MM is unique to each individual, so the way it affects each patient will vary widely. Prof. Siobhan Glavey's group are working on a test known as the MMprofiler, which analyzes 92 different genes associated with MM. This could be used as a tool to predict disease progression in MM patients in Ireland. The test may also help a doctor decide which therapy is best for a patient, based on their unique genetic makeup. However, this will involve studying a large number of MM patients in order to assess the accuracy and clinical relevance of the test.

Another method for predicting how long MM patients might live is also being tested in Prof. Glavey's lab and in many labs internationally. This is known as MRD (Minimal Residual Disease) Testing. MRD Testing uses next generation sequencing (NGS) to detect very small numbers of cancer cells remaining in the body after treatment, even if a patient appears to be in remission. To locate these cells, scientists use your genetic sequence to compare changes that occur before and after treatment. Detecting MRD can offer invaluable insights into the likelihood of relapse. If MRD is detected, doctors can develop treatment plans to prevent relapse. If MRD is not detected, it's a good sign that the patient has responded well to treatment.

New MM drugs

Since drugs sometimes stop working in MM patients, ongoing research is essential to find new drug targets that could kill (or even stall) cancer cell growth. An existing drug called Venetoclax works well in MM patients whose cancers have lots of a protein called BCL-2, but is no use in patients whose cancers have very little BCL-2. However, Dr. Triona Ní Chongaile's group (funded by Leukemia Research Foundation, Science Foundation Ireland, Breakthrough Cancer Research and the Irish Research Council) are investigating a drug that turns certain genes on or off and could be combined with Venetoclax to work even in MM patients with low levels of BCL-2.

New drug-testing models

Creating new models for studying MM is critical to open up new avenues for researchers to better understand disease biology and to test new treatments. Some of the current models use large numbers of laboratory mice, but are still imperfect models of human MM biology. As an alternative, scientists led by Prof. Siobhan Glavey and Dr. Ann Hopkins (funded by Breakthrough Cancer Research and the Health Research Board) are developing innovative new non-animal laboratory models of MM. They will

use these models to test candidate new drugs that they have developed against novel targets on MM cells. The development of new models could help speed up drug testing processes, potentially bringing new treatments into clinical trials sooner.

GALWAY UNIVERSITY HOSPITAL:

Stopping MM from spreading

The group of Prof. Michael O'Dwyer and Dr. Aideen Ryan (funded by Science Foundation Ireland, the Galway University Foundation and the Irish Cancer Society) studies special features on the surface of MM cells. These have a dense coating of natural sugars (especially one called sialic acid) that helps MM cells spread around the body and makes it harder for the body's immune cells to kill them. Their research has found that removing these sugars or blocking/removing the sugar coating of a particular protein called PSGL-1 may help reduce the spread of cells, as well as enhance their killing by a patient's immune cells. Another aspect of their research relates to the study and targeting of normal (non-cancerous) cells, called stromal cells, in the bone marrow of MM patients. It is well-recognised that MM cells can co-opt stromal cells to help them survive and to keep the immune system from killing them. The group has found that sialic acid coatings on stromal cells play an important role in suppressing the immune system, which might explain why some patients do not respond to immunotherapy drugs. They are currently investigating different chemical approaches to strip sialic acid from stromal cells, with the hope that immune cells may again be able to recognise and kill MM cells.

QUEEN'S UNIVERSITY BELFAST:

Combating drug resistance

Drugs called proteasome inhibitors have greatly improved outcomes for MM patients. However, some patients stop responding to these drugs, and their disease relapses. Dr. Lisa Crawford's laboratory at Queen's University Belfast (funded by Leukaemia & Lymphoma Northern Ireland) is investigating ways of "getting around" this problem. Specifically they are trying to understand how MM cells become resistant to proteasome inhibitors, and if other drugs that target different parts of the biological pathway called the proteasome (which is like a built-in recycling centre for cells) could be used as alternatives to kill MM cells that have become resistant to drugs.

Technology to understand MM

Dr. Ian Overton's group develops software that makes sense of large datasets in order to inform clinical decision-making, such as predicting which patients will respond to a particular treatment. They are building personalized molecular maps of drug resistance for individual patients, to help doctors understand how resistance develops and to predict alternative treatment options. They are also working to analyse electronic

healthcare data for MM patients across the island of Ireland, to ultimately improve patient outcomes. Their work is funded by Myeloma UK, Almac Discovery, the UK Engineering and Physical Sciences Research Council and the Higher Education Authority (HEA) Shared Island North-South Research Programme.

LABORATORY AND TRANSLATIONAL RESEARCH

What lab breakthroughs have ended up in patients?

MM research begins in laboratories. Scientists are constantly studying MM biology to develop potential new treatments. New therapies need to be tested through clinical trials to make sure they are safe and effective.

Some examples of lab discoveries that moved successfully into MM clinical trials:

1. **Chimeric antigen receptor (CAR)-T cell therapy**: In this approach, immune cells are taken from a patient's blood and "trained" in a lab to recognize the patient's own tumour cells. Millions of these immune cells are then grown up in the lab, before being transfused back into the patient, where they are much better at recognizing and attacking the tumour. CAR-T and cellular therapies for MM will soon be available in two sites in Ireland, Galway University Hospital and St James's Hospital, Dublin. To read more from MacMillan Cancer Support, visit **bit.ly/46rDTZ5**
2. **Histone deacetylase (HDAC) inhibitors**: These drugs help boost the levels of cancer-killing proteins made by the body. Panobinostat is an example that works well with other MM medications to enhance patient survival.
3. **Immunomodulatory imide drugs (IMiDs)**: Boost our body's immune response against cancer cells. Lenalidomide and pomalidomide are two IMiDs approved for MM treatment. IMiDs in combination with other anti-myeloma medications are being studied in a number of current clinical trials. To read more, visit **bit.ly/3PvQOlJ** from MacMillan Cancer Support.

What MM drugs were approved in clinical trials?

The simple answer – **all existing MM drugs**!

Some of these therapies include:

Proteasome inhibitors (PI):

Bortezomib (Velcade) is a PI drug used to treat MM patients that stop responding to first-line drug treatments. Proteasomes are like mini-shredders inside cells that break up unwanted or damaged proteins so they can be disposed of. Bortezomib works by interfering with this process, causing excess proteins to build up to toxic levels in MM cells, causing cells to die. Because MM cells produce way more proteins than healthy cells, they are more vulnerable to bortezomib's effects. Bortezomib has become the gold standard of treatment in MM patients.

Steroids (Glucocorticoids)

Steroids can help to treat the symptoms of MM by reducing swelling and bone pain. Steroids like dexamethasone or prednisolone can be combined with other drugs to make treatments more effective. The move to “at home steroid treatment” is a way in which research has improved the quality of life for patients.

Immunomodulatory imide drugs (IMiDs)

Thalidomide is one of the oldest IMiDs. Approved drugs in the IMiD class include Lenalidomide (Revlimid), which has fewer side effects than thalidomide, and a third-generation drug called pomalidomide (Pomalyst). They affect the body’s immune system by stopping the growth and survival of myeloma cells,

by blocking the growth of new blood vessels that “nourish” developing tumours, and by alerting immune cells to seek and destroy MM cells.

Stem cell transplantation

Stem cells are cells which are highly versatile. In fact, they’re so versatile that they can develop into all the different cell types in the body! In MM, aggressive therapies that are used to kill the cancer cells end up damaging the patient’s healthy blood cells as well. If a patient’s own stem cells are taken from their blood before their treatments, they can then be put back into the patient afterwards to restore all the blood cells that help the patient recover. This is called an **autologous stem cell transplant**.

Sometimes, older or sicker patients with high-risk disease may receive something called a donor stem cell transplant instead. This involves using stem cells from the blood of a carefully-matched donor to restore the patient’s blood cells after the cancer cells have been killed off.

Ongoing clinical trials continue to evolve the best way to use stem cell transplants in MM patients.

Clinical Trials

If eligible, your healthcare team may offer you a clinical trial as part of your cancer treatment. They will inform you about the trial and what it hopes to achieve. Ultimately, it is your decision whether or not you choose to take part. Patients are free to leave the trial at any point if they choose, and their care will not be compromised.

If you choose not to participate in a clinical trial, your doctor will give you the standard treatment and care for the type and stage of cancer you have.

The benefits and risks of participating in cancer clinical trials are:

Advantages / Benefits	Disadvantages / Risks
Access to novel therapies / therapy combinations not yet available to the public	Although clinical trials are designed with safety at the forefront, unpleasant or unexpected side effects sometimes occur, and in very rare cases a treatment might harm you
Timely access to alternative therapies if your treatment stops working	
Increased follow-up on patients enrolled in clinical trials, so your clinical team will be monitoring very closely what is working best for you	More hospital visits, more blood tests/ scans, more paperwork for you to complete (e.g. questionnaires or diaries); some of which may continue after your treatment has finished
Being involved in the approval of more effective therapies sooner	Approval of new therapies is a long process – the acceptance of a new drug or process might not be seen in your lifetime
Opportunities to change future patient care	

If you are interested in learning more about what cancer clinical trials may be open to you, please ask your healthcare team or contact Cancer Trials Ireland (info@cancertrials.ie).

You can also visit the Cancer Trials Ireland website at www.cancertrials.ie and MacMillan Cancer Support website bit.ly/3PyReHU

Get involved in MM patient advocacy...where do I start?

A patient advocate is somebody who uses their voice and experience to support and educate patients, families, caregivers, researchers, employers or policymakers about MM.

In the words of Ann Fleming: *"As an MM patient, public and patient involvement (PPI) has been incredibly important for me. In recent years there has been a huge increase in the development of new drugs and treatment options, and PPI participation helps me understand my disease better so that I can make informed choices about my treatment pathway. I have also been amazed by the enthusiasm, hard work and drive of the clinicians and researchers that I engaged with, and this has given me and my family a lot of hope for the future. PPI allows me the opportunity to give something back and I hope, as a patient advocate, that sharing my experience with other MM patients gives them hope too".*

If you are interested in becoming an MM patient advocate, you could start by reading the following information from the Myeloma Patients Europe organization www.mpeurope.org/get-involved-in-mpe-activities and the Irish Cancer Society www.cancer.ie/advocate

Useful Links

MM Support Groups hosted by MM Ireland:
www.multiplemyelomaireland.org/support-groups

Current MM trials in Ireland:
www.cancertrials.ie/current-trials/lymphoma-blood-cancers/multiple-myeloma

Lay friendly description of cancer therapies:
www.macmillan.org.uk/cancer-information-and-support/treatments-and-drugs

Myeloma Charities and organizations:
www.multiplemyelomaireland.org

www.mpeurope.org

GLOSSARY

Antibodies: Substances produced by plasma cells that help the body to fight infection.

Autologous Stem Cell transplant: A patient's own healthy blood cells are collected before chemotherapy, stored, and then given back to the patient after chemotherapy.

Biobank: A collection of clinical information and biological samples (such as blood, DNA or tissue) established to support research into understanding more about diseases and how to treat them.

Bone marrow: The spongy centre of bones, from where all our blood cells are derived.

Cancer: The abnormal and uncontrolled growth of cells in the body.

Cell line: Cells taken from a consenting patient and grown in the laboratory for research purposes.

Chemotherapy: Using drugs to kill cancer cells or to stop them from growing.

Clinical trial: Testing a drug or therapy on a consenting group of people to ensure that it is working as it should before being approved for the wider patient population.

Diagnosis: The process of identifying a disease or condition from its signs and symptoms plus certain tests.

Genes: Carry the code to determine your characteristics and features.

Genetics: The study of genes and how features and characteristics are passed on from one generation to the next.

Multiple myeloma (MM): Cancer caused by uncontrolled multiplication of plasma cells in the bone marrow.

MRD: Minimal Residual Disease, a small number of cancer cells that may remain in the body after treatment.

Plasma cell: A type of white blood cell (immune cell) which produces antibodies.

Platelets: The cells in our blood that are responsible for blood clotting in order to prevent excessive bleeding.

Progressive: Progressive, or progression, means when a disease, like MM, worsens over time.

Radiation Supportive Care: Minimizing side effects to improve patient well-being during/after radiation therapy.

Red blood cells: Made in the bone marrow, responsible for carrying oxygen around the body.

Refractory disease: When patients do not respond to multiple drug classes that work in different ways.

Relapse: The return of the cancer or its symptoms after a period of remission (improvement).

Second line therapy: A secondary treatment option used when initial treatments stop working.

MGUS: Monoclonal Gammopathy of Undetermined Significance. Clinicians will monitor this condition as it can sometimes progress to SMM.

SMM: Smoldering Multiple Myeloma. Plasma cells are abnormal, but there are no symptoms.

Targeted therapy: A drug that targets a specific protein or signalling pathway in cancer cells.

White blood cells: Immune cells that roam in the blood to defend the body against infection.

ACKNOWLEDGEMENTS

This booklet was written by 2 RCSI student researchers, **Niamh McAuley** and **Izabela Drozdz** *(pictured)* in collaboration with a panel of MM patients, patient advocates, researchers and clinicians. The panel thank Breakthrough Cancer Research www.breakthroughcancerresearch.ie and The Health Research Board www.hrb.ie for funding its production through Health Research Charities Ireland www.hrci.ie grant #HRCI-HRB-2022-020 *(to Ann Hopkins and Siobhan Glavey)*. We also thank the **RCSI PPI Ignite Network** for support. ***Finally, we thank you, the reader. We hope you have found our booklet informative and inspiring, whatever your reasons for picking it up.***

Emma Cassoni, MM Patient Advocate ~ **Izabela Drozdz**, Student Researcher, RCSI University of Medicine and Health Sciences ~ **Ann Fleming**, MM Patient ~ **Rachel Fox**, Advanced Nurse Practitioner, Beaumont Hospital **Avril Furey**, Clinical Nurse Specialist, Beaumont Hospital ~ **Siobhan Glavey** MRCPI PhD FRCPath, Researcher and Consultant Haematologist, Beaumont RCSI Cancer Centre ~ **Ann Hopkins** PhD, Researcher and Education Lead, Beaumont RCSI Cancer Centre ~ **Niamh McAuley**, Student Researcher, RCSI University of Medicine and Health Sciences ~ **Niamh Murray**, MM Patient.

Testimonials

Niamh McAuley, RCSI researcher

"It is inspiring to see MM patients surviving for much longer, thanks to research in the field. My research focuses on designing a new targeted drug therapy to stop the spread of the disease to other sites in the body. The emergence of new treatments would not be possible without patients contributing to research."

Dr. Aoife Cahill

Programme Manager, Health Research Board

"The HRB is delighted and proud to have supported this initiative. This booklet is an example of how bringing patients, patient advocates, clinicians and researchers together a useful, accessible resource can be created that informs and helps patients to make decisions about their health and taking part in research."

Ms. Orla Dolan

CEO, Breakthrough Cancer Research

"We at Breakthrough firmly believe that through research we will better understand, diagnose and treat cancer. It is through research that more patients will survive, and through research that more people will live well after a diagnosis. We are proud to fund some of the world-class MM research being done by talented scientists in Ireland, such that one day we will be able to say MM is curable."

Dr. Eva Szezgedi

Director, Blood Cancer Network Ireland

"BCNI is a nationwide collaboration for blood cancer research. It includes a biobank, a patient registry and clinical trial support for novel blood cancer treatments in Ireland. BCNI is a prime example of how patients, clinicians and researchers working together can drive better understanding and better treatments for MM."

Izabela Drozdz, RCSI researcher

"I have worked on MM research since university. My current work is developing an exciting model for MM tumour growth, which will provide a platform for the testing of new therapies. I strongly believe that developing better MM models and involving patients in research is the key to better long-term outcomes."

Beaumont-RCSI Cancer Centre,
Beaumont Hospital, Dublin 9.
beaumontrcsicancercentre.ie

To find out more scan the QR code or visit
www.rcsi.com/people/profile/siobhanglavey
www.rcsi.com/people/profile/annhopkins