

C O R P O R A T E   N E W S

# MASSIVEBIO

YEAR:2022 / ISSUE:01

PARTICIPATE  
IN CLINICAL  
TRIALS?

SYNERGY-  
ARTIFICIAL  
INTELLIGENCE

NEW  
RESEARCH

**100K**  
SINGULARITY  
PROGRAM

*LIVING WITH  
MYELOFIBROSIS*

MASSIVE BIO FOUNDER

# SELIN KURNAZ

COMPETING WITH WORLD-CLASS  
ARTIFICIAL INTELLIGENCE COMPANIES





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## **MASTHEAD**

### **Publisher, CEO**

Selin Kurnaz

### **Global Operations, COO**

Steve McNamara

### **Finance, CTO**

Cagatay Culcuoglu

### **Medical Director, CMO**

Arturo Loaiza-Bonilla, MD

### **HR & Operations Manager**

Aycan Emre

### **Managing Editor**

Sehriban Merve Sahin

### **Medical Editor**

Tim Gower

### **Business Development and Marketing**

MaLinda Ross

### **International Strategic Partnership**

Caglar Demirbag

### **Director of Global Marketing**

Erkan Terzi

### **Creative Marketing Manager**

Ismet Kale

### **Software Development Director**

Ertugrul Tuysuz

### **AI Coordinator**

Sina Alp

### **Designer**

Ahmet Egilmez

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“ Thanks to the technology created by Massive Bio with artificial intelligence and its expert staff, cancer patients can learn from their homes whether they are suitable for more than 10,000 clinical studies. ”



# I HOPE OUR FIRST ISSUE BRINGS HEALTH AND HAPPINESS

This company started out with a personal wish. When my uncle died of cancer, I saw a problem with the way cancer was treated. Cancer is one of the most widespread diseases across the world, indiscriminately targeting people from the young to the old, but scientific innovations and breakthroughs in this field take years or even decades to reach the patients who need them. While new treatments appear on a more regular basis now than ever before, price and location prohibit those who need these treatments more than anything from accessing them.

When we entered this sector, we brought two major innovations. Our first innovation was targeted specifically towards patients and making their lives easier. Before Massive Bio, patients did not have the ability to register for a clinical trial without going through multiple visits and procedures. This is a process they can perform from a cell phone or computer using our technology. Now, thanks to the technology created by Massive Bio with artificial intelligence and its expert staff, cancer patients can learn from their homes whether they are suitable for more than 10,000 clinical studies.

Our second innovation focuses on pharmaceutical companies. Many companies hosting clinical trials have trouble finding patients to enroll as participants. With the emergence of personalized medicine specifically based on the patient's needs, there has been a significant increase in the number of studies.

We are excited to bring you the first issue of our quarterly magazine.

Among the topics of our first issue, we wanted to tell you about our success stories and our unique technology that helped bring us to this point.

We wanted to inform you about our application, SYNERGY-AI, which facilitates the life of cancer patients.

I wish you pleasant reading!

*Selin Kurnaz*  
PhD, Co-founder and CEO



# We believe

all people should have equal access to leading-edge therapies and new emerging clinical trials, regardless of where they live or their ability to pay.





All people should have equal access to leading-edge therapies and new emerging clinical trials, regardless of where they live or their ability to pay.

Massive Bio is a central hub that connects patients to the best treatments and clinical trials available.

Our team and technology work together to provide a space dedicated to connecting each patient with the best treatment.

**Why We Started Massive Bio**

We founded Massive Bio because we've been in your shoes. We experienced loved ones battling cancer

within a broken healthcare system and knew there had to be more we could do. We knew about the existence of clinical trials, but couldn't believe how difficult it was to find them, and to find the right ones, so we created Massive Bio.

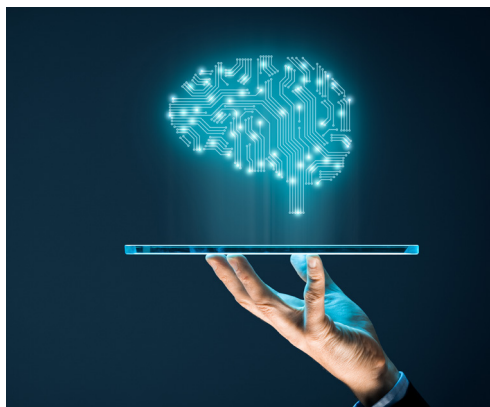
We believe every person – regardless of location, occupation, or income – deserves the best chance to receive world-class healthcare options to survive and thrive.

## Our Investors



# NEWS BRIEFS

## FROM MASSIVE BIO



### Massive Bio Selected for NYC Digital Health 100

Massive Bio was featured in the NYC Digital Health 100, a listing of New York City's most promising start-ups compiled by New York City Health Business Leaders (NYCHBL), an organization that serves as the gateway to New York's healthcare ecosystem. The NYC Digital Health 100 is released alongside the NYCHBL Healthcare Innovation Report 2022, an in-depth look at the data, trends, and insights defining the healthcare industry in New York.

### Selin Kurnaz named one of the most successful female business leaders

Massive Bio Co-Founder and CEO Selin Kurnaz, PhD, took part in Turkey's Women Bosses research prepared by Fast Company magazine. Kurnaz entered the list, which has been published annually since 2020 to promote successful women in the business world, at 44th place.



### Massive Bio raised \$9 million for growth and expansion

Massive Bio, Inc., a leader in precision medicine and artificial intelligence (AI) enabled patient-centric clinical trial enrollment, received an investment of \$9 million from Revo Capital and Kenan Turnacıoğlu PaigeAI, with additional participation from DEG – Deutsche Investitions- und Entwicklungsgesellschaft mbH, the German Development Finance Institution. This investment will enable the company to further scale its operations globally, invest in marketing, and launch additional non-status quo products in oncology clinical trial enrollment with its data-rich platform.



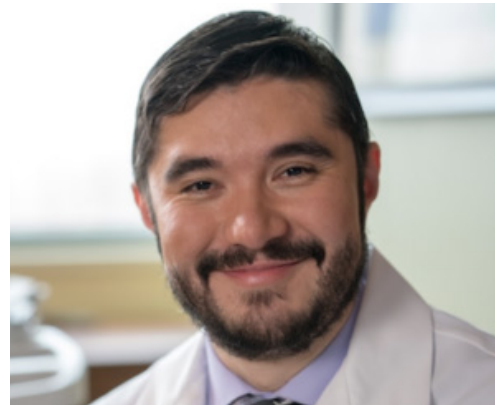


## MPN Forum Live podcast

Czerny Cohen, vice president of clinical operations at Massive Bio, and Fiona Evans, lead patient advocate at Massive Bio, were guests on the MPN Forum Live podcast, hosted by Jeremy Smith. They explained how the company helps cancer patients access all treatment options, including clinical trials.

## Arturo Loaiza-Bonilla, MD, attended BIO International Convention

Massive Bio Co-Founder and Chief Medical Officer Arturo Loaiza-Bonilla, MD, MEd, participated in a panel discussion at the BIO International Convention, which took place June 13 – 16 at the San Diego Convention Center in California. During the discussion, which was titled “The Roles of Artificial Intelligence and Big Data in Precision Healthcare: Perspectives from the Drug Development Pathway and Patient Journey,” Dr. Bonilla gave information about the problems that cancer patients experience while participating in clinical trials, and the big data and AI technologies that Massive Bio has developed as solutions.



## Massive Bio prepares for new investment round

Massive Bio, which closed its Series A round with \$9 million, is embarking on a new investment tour to continue its growth. The company aims to receive an investment of \$25 to \$30 million in the latest round.

# NEWS BRIEFS FROM MASSIVE BIO

# MASSIVE BIO COMPETES WITH GLOBAL INDUSTRY GIANTS IN ARTIFICIAL INTELLIGENCE TECHNOLOGY

Massive Bio is launching personalized clinical research matching technology to reach 100,000 cancer patients.

Artificial intelligence technology has led to great revolutions in the health sector, as it has in many other fields. Technology, which is developing day by day, is of vital importance when it comes to health, as well as making human life more manageable. Of course, the situation becomes even more complicated if the issue is an area such as cancer that has not yet been resolved, even within the health sector. The solution lies in new-generation treatment methods.

Conducting clinical research and enrolling patients in clinical trials are deeply challenging and complex processes—at times it can literally feel like “swimming against the tide.” However, Massive Bio was founded to “erase cancer from the map,” and we’re succeeding in this mission thanks to the artificial intelligence technology we have developed.

## **Molecular Profiling System**

Massive Bio, which performs comprehensive molecular profiling through Next Generation Sequencing (NGS) testing, provides cancer patients with personalized service at the right time and appropriate scale. Cancer patients enter their data into the Massive Bio system, and our artificial intelligence algorithms quickly guide the patient to the most appropriate treatment among existing clinical studies. Moreover, since it does this by considering the personal rights of the patients, the whole process takes place while protecting their privacy.

## **Regulations Criteria**

Indeed, at Massive Bio, patient confidentiality

comes first. All medical reports are confidential. After patients send us their reports, the patient’s personal information is filtered by our algorithms, and all personal information is encrypted. Then, the data of our patients are reported, and clinical trial matching processes begin via CTMS. All data collection processes are carried out within the knowledge of the patients and conforms to HIPAA, GDPR, and EU Clinical Trial criteria.

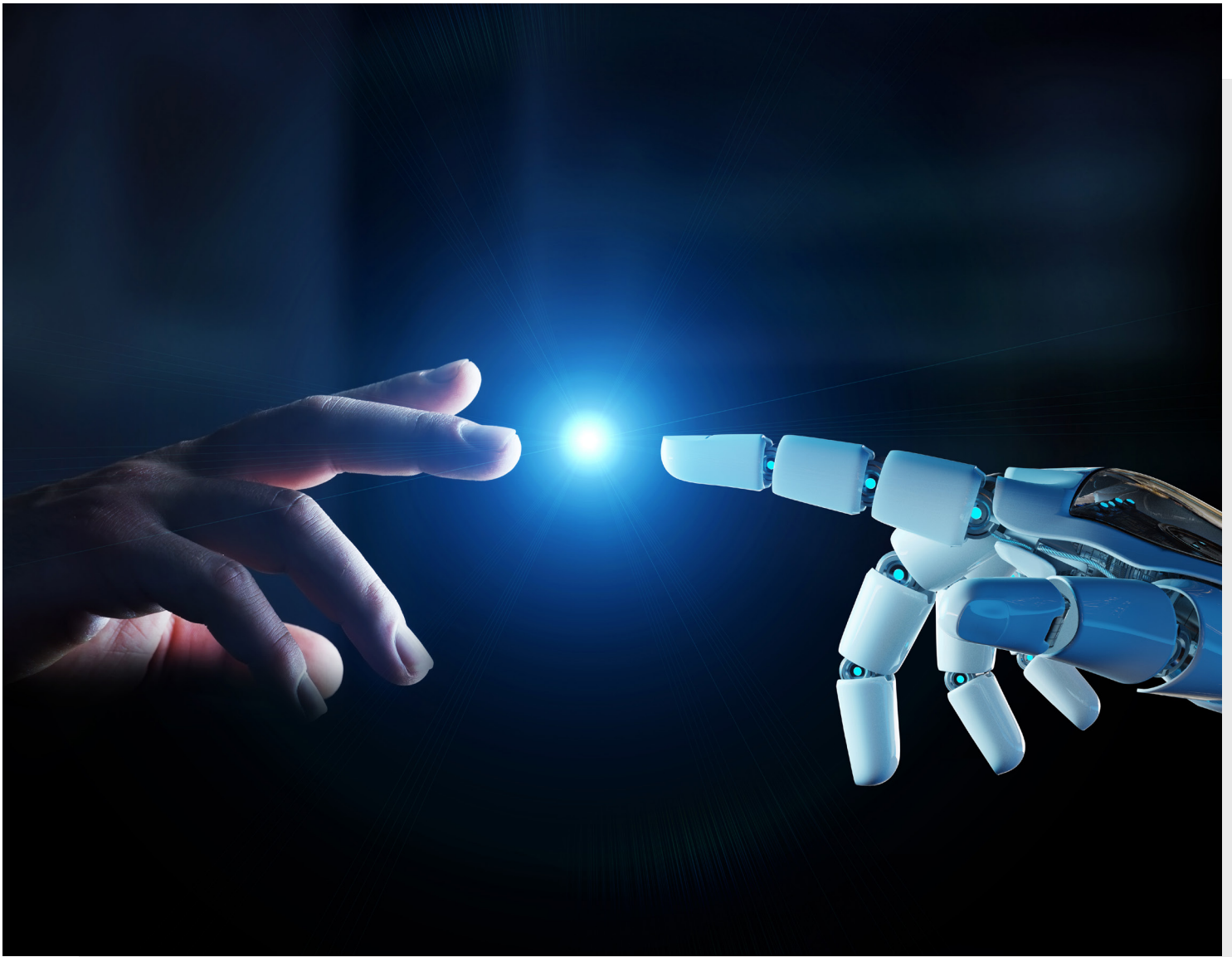
## **NLP and Computer Vision technology**

Using technologies such as NLP (Neuro-Linguistic Programming) and computer vision, Massive Bio quickly matches clinical research data from around the world with patient data and finds the most suitable treatment method within minutes.

Massive Bio is the only company in the world with these features. It provides a unique technology-enabled service and big data platform for the health-care industry by solving bottlenecks in participation in clinical trials wherever they are in the world. It focuses on improving the lives of cancer patients. It also serves pharmaceutical companies, contract research organizations, and hospital networks. Massive Bio, which has worked with 60,000 cancer patients in 12 countries, aims to rapidly expand its presence around the globe to erase this disease from the map by helping more people find the treatments they need.

Massive Bio, which set out with the mission of “erasing cancer from the map,” achieves precisely this and has been giving hope to cancer patients since its establishment, thanks to the artificial intelligence technology it has developed.





HIGH-LEVEL  
STRATEGY  
LEADERS OF THE  
PHARMACEUTICAL  
INDUSTRY GATHERED  
AT THE GUIDEHOUSE  
WEBINAR



Massive Bio co-founder and CEO Selin Kurnaz, PhD, participated in a roundtable discussion on increasing diversity and inclusion in clinical research.

A recent analysis of the National Cancer Database (NCDB) that included over 12 million patients who were treated for 46 different forms of cancer from 2004 through 2015 found that less than 0.1% were enrolled in clinical trials as their initial course of therapy. The analysis also revealed that patients with cancer treated in clinical trials lived longer than those not treated in trials.

To enroll 100,000 patients, Massive Bio has established innovative patient-acquisition partnerships globally with more than two dozen patient advocacy groups, data-driven patient identification companies, provider networks, next-generation sequencing (NGS) vendors, payers, specialty pharmacies, and local clinical research organizations (CROs).

The 100K Singularity program will initially focus on lung, cervical, breast, prostate, gastric, gastroesophageal junction, and pancreatic cancers, as well as non-Hodgkin lymphoma, myelofibrosis, central-nervous system tumors, pediatric tumors, melanoma, and multiple myeloma, as well as cancers that are driven by potentially actionable biomarkers such as gene fusions, and will continue to expand to other malignancies. The new catalog of clinical trial matching solutions will be available to cancer patients globally through the Massive Bio website and apps across iOS and Android platforms.

With close to 14,000 interventional oncology clinical trials actively recruiting patients around the globe at any one time, and more than 18 million patients diagnosed with cancer each year, Massive Bio representatives say this program will drive better outcomes for cancer patients and accelerate drug development through more ef-

ficient patient enrollment for pharmaceutical, and biotechnology companies, CROs, and clinical research sites.

"We can and must do much better, using data, technology, and services that are laser-focused on targeted therapies and immunotherapies, while drastically increasing diversity and inclusion in clinical trials," said Arturo Loaiza-Bonilla, MD, co-founder of Massive Bio, about the 100K Cancer Clinical Trial Singularity Program. "We named the program 'singularity' because the clinical research industry needs transformational change on an exponential scale to effect a quantifiable increase in clinical trial enrollment rates. Otherwise, we will be discussing the same issues in the decades to come."

"This is our calling," added Selin Kurnaz, PhD, co-founder, and chief executive officer of Massive Bio. "We have been planning this moment for a very long time. We are building and leading the patient enrollment value chain in oncology. Everything is about efficiency and scale. We are engineering every component of the value chain with extreme precision and accuracy. We are building the puzzle pieces – we have on-boarded 65,000 patients and partnered with 26 pharmaceutical companies, CROs, and health systems at 1,000 clinical trial sites. We launched the world's first NASA-style Oncology Clinical Trial Command Center (OCTCC). Now, it is time to activate more patients and enterprise partners to hit critical mass, so there is no going back. As much as we take the lead, we look forward to the collaboration. What is more impressive is that we are providing services to cancer patients for free globally so that anyone can join this movement," said Kurnaz.

# AdhereTech and Massive Bio Announce AI-Enabled, Patient-Centric Oncology Solutions Partnership

AdhereTech and Massive Bio Announce AI-Enabled, Patient-Centric Oncology Solutions Partnership



Massive Bio, Inc., a leader in precision medicine and artificial intelligence (AI)-enabled patient-centric clinical trial enrollment for oncology, and AdhereTech, a pioneer and leading provider of smart devices that connect patients to care with real-time interventions, announced their partnership to provide advanced, data-driven digital health technology solutions, focusing on oral oncolytic agents providing real-time integrated access to care for cancer patients to precision oncology drugs and leading-edge

clinical trials. Both companies were recognized in the 2022 NYC Digital Health 100, which showcases the most exciting digital health companies in the New York region.

Massive Bio and AdhereTech have committed to combining their products and services to offer global, comprehensive solutions to measure, analyze and monitor precision oncology medication adherence for patients participating in clinical trials and those prescribed commercially

available treatments. Both companies currently are contracted with leading pharmaceutical companies and major specialty pharmacies. They work with payers, pharmacies, and pharmaceutical companies to develop adherence programs utilizing device-generated data to optimize processes and improve cost-effective measures for specialty drug and clinical trial programs, which may save the healthcare industry hundreds of billions of dollars per year.

# LIVING WITH MYELOFIBROSIS: SUPPORTIVE CARE SERIES

Massive Bio patient advocate Syeda Hasan recently joined Abdulraheem Yacoub, MD, in a Facebook Live event titled “Living with Myelofibrosis.” Dr. Yacoub is an associate professor in the division of hematological malignancies and cellular therapeutics at the University of Kansas Medical Center, in Westwood, Kansas. He and Syeda discussed a variety of topics about myelofibrosis, a rare bone marrow cancer, including its causes and symptoms, and how it’s treated.

Dr. Yacoub offered his perspectives and expert opinions on many other common concerns that patients have about the disease. Syeda Hasan offered information about living with myelofibrosis and the unknowns about myelofibrosis. Patients and caregivers with myelofibrosis also participated in the live broadcast via chat, sharing their questions about managing this bone marrow disorder.



# MASSIVE BIO PARTNERS WITH AMBER SPECIALTY PHARMACY FOR DIGITALLY ENABLED ONCOLOGY CLINICAL TRIALS THROUGH AI TECHNOLOGY PLATFORM

Massive Bio co-founder and CEO Selin Kurnaz, PhD, participated in a roundtable discussion on increasing diversity and inclusion in clinical research.

Massive Bio, Inc., a leader in precision medicine and artificial intelligence (AI)-enabled patient-centric clinical trial enrollment for oncology, and Amber Specialty Pharmacy, a pioneer and leader in the specialty pharmacy industry with true best-in-class programs and locations strategically placed across the United States, announced its partnership to provide advanced data-driven technology solutions for patient recruitment services to the oncology research ecosystem, and thereby offer better access for cancer patients to leading-edge clinical trials. Through this partnership, Amber Specialty Pharmacy will seamlessly connect patients in need of clinical trials with Massive Bio's matching and concierge enrollment services and support cancer patients and providers throughout the country; the combined capabilities include Amber's 26 million payer lives, over 50 U.S. Limited Distribution Networks and Massive Bio's 65,000 unique cancer patients, global presence in 12 countries – making this the first and largest partnership of its kind.

"Amber Specialty Pharmacy is dedicated to meeting cancer patients' clinical, emotional, and financial needs and their caregivers. Our Oncology Center of Excellence (COE) was designed to provide cancer patients with an enhanced level of care during their treatment journey," said Kristin Williams, president of Amber Specialty Pharmacy. "When faced with a cancer diagnosis, time is of the essence. Advanced cancer patients must have real-time access to readily available resources, including clinical trial options and a pathway to enrollment across lines of therapy. Massive Bio's AI technology platform and expertise in cancer clinical trials are fully aligned with these goals, resulting in improved health outcomes and reduced costs for the industry," Williams added.

Amber Specialty Pharmacy's patient-centered model of care and oncology COE team provides patients and their caregivers individualized care with ongoing



education and support to ensure patients have what they need to feel supported throughout their treatment journey. They also utilize a proprietary AI model to identify patients at risk for lower adherence early in treatment, which allows real-time interventions, offering guidance and support to patients, leading to positive treatment outcomes. The model is also built to remove barriers to coverage and build bridges toward seamless collaboration between providers and pharmacies.

"Amber Specialty Pharmacy's best-in-class service model has earned the trust of the nation's largest stakeholders in healthcare, as well as many pharmaceutical commercial partners in the oncology space," said Selin Kurnaz, Massive Bio's co-founder and chief executive officer. "Massive Bio's patient-centered and AI-augmented approach to trial recruitment leveraging our command center and SYNERGY-AI engine, combined with Amber's advanced analytics and capabilities using a technology platform with real-time patient insights, enables all the oncology research stakeholders to optimize patient enrollment and activation at an exponential scale nationwide. We are the only company to use an AI-integrated app and mobile technology to find your eligibility for clinical trials and the best sites closest to you. It is a natural extension to integrate and partner with Amber's outstanding Oncology COE model and platform."





“Amber Specialty Pharmacy’s best-in-class service model has earned the trust of the nation’s largest stakeholders in healthcare, as well as many pharmaceutical commercial partners in the oncology space.”



# MYELOFIBROSIS

This rare blood cancer can progress slowly and may cause few symptoms in early stages. However, many patients eventually require advanced treatments.

Myelofibrosis is a rare type of blood cancer that's characterized by the abnormal buildup of scar tissue in bone marrow. This condition causes anemia and other symptoms that can become life-threatening if left untreated. Myelofibrosis is often diagnosed during routine blood tests or after a bone marrow biopsy.

## What Is Myelofibrosis?

Myelofibrosis causes scar tissue to replace bone marrow, the soft, fatty tissue inside most bones. Production of abnormal cells eventually overwhelms the bone marrow's ability to generate enough normal blood cells, including red blood cells, which transport oxygen to tissues; white blood cells, which fight infection; and platelets, which aid in blood clotting.

## How Does Myelofibrosis Develop?

Scientists believe that myelofibrosis originates in bone marrow stem cells. These stem cells can divide and multiply into a variety of specialized cells

that make up the bone marrow and blood. When a mutation in the DNA of a single blood-forming (hematopoietic) stem cell occurs, that altered DNA is passed on to new cells as the mutated bone marrow cell replicates and divides. Over time, this can result in myelofibrosis.

A mutation in the Janus kinase 2 gene (JAK2) affects 50 to 60 percent of patients with myelofibrosis, while a mutation in the calreticulin gene affects about 25 percent. Several additional mutations have recently been discovered in myelofibrosis patients and other possible gene variants linked to disease are being investigated by researchers. The cause of these gene mutations is unknown. Myelofibrosis generally progresses slowly, and some people may go years without experiencing any symptoms. Other patients' bone marrow may deteriorate over time and require treatment. Patients must be monitored on a frequent basis in both circumstances.

# There is always hope

Our Artificial Intelligence makes it easy to search for clinical trial options for your symptomatic myelofibrosis.



## Myelofibrosis and Related Cancers

Myelofibrosis belongs to a group of cancers known as myeloproliferative neoplasms, which are characterized by the overproduction of red blood cells, white blood cells, or platelets. There are six forms of chronic myeloproliferative neoplasms:

- Primary myelofibrosis (also called chronic idiopathic myelofibrosis)
- Polycythemia vera
- Essential thrombocythemia
- Chronic myelogenous leukemia
- Chronic neutrophilic leukemia
- Chronic eosinophilic leukemia

## What Are the Symptoms of Myelofibrosis?

Myelofibrosis can cause a variety of symptoms. The most common is fatigue, which may be severe and limit your ability to perform routine daily tasks. You may also have:

- Shortness of breath

- Bone pain
- Anemia (low red blood cell count)
- Bruising or bleeding
- Numbness or tingling in your feet and hands (peripheral neuropathy)
- Swollen or painful abdomen, caused by enlarged spleen or liver

## Tests for Myelofibrosis

The following tests may be used to diagnose myelofibrosis:

**Blood test:** A blood test is a procedure in which a sample of blood is drawn from an artery or vein. The sample of blood can be tested for several things, including the number of red blood cells, white blood cells, and platelets. A blood test can detect if you have anemia or other conditions that affect your body's ability to form new blood cells.

**Bone marrow biopsy:** A bone marrow biopsy is a

procedure in which a doctor uses a fine needle to remove a sample of bone marrow tissue, usually from your hip bones, for examination under a microscope.

**Imaging tests:** Various imaging tests may be used to diagnose and monitor myelofibrosis, including X-rays, magnetic resonance imaging (MRI), ultrasonograms, and computed tomography (CT) scans.

#### **How is Myelofibrosis Treated?**

The treatment for myelofibrosis that your doctor recommends is determined by your symptoms and other factors. If you are free of symptoms, you may be able to postpone treatment and be closely monitored, an approach called watchful waiting. With this strategy, you'll see your doctor

- Medication, which includes drugs called myelosuppressive agents, which hinder bone marrow's ability to make blood cells; JAK inhibitors, which can reduce spleen enlargement and improve other symptoms; and thalidomide or lenalidomide, which also relieve symptoms, but must be used with extreme caution by women of child-bearing age.
- Radiation therapy, which may be recommended to shrink an enlarged spleen.
- Splenectomy, or surgical removal of an enlarged spleen.
- Stem cell transplants, which can cure myelofibrosis, but only select patients are candidates.

#### **Myelofibrosis Clinical Trials**

Massive Bio specializes in finding advanced clinical treatments for every type of myeloprolif-

“ You may be able to postpone treatment and be closely monitored, an approach called watchful waiting.

for routine checkups and testing to determine if you have developed problems such as anemia or spleen enlargement. If you develop symptoms, your doctor will tailor treatment to you, since each patient is affected by myelofibrosis in different ways. Your doctor will consider your age, blood cell counts, amounts of immature blood cells called blasts, as well as symptoms (such as anemia, spleen enlargement, or severe weight loss) when devising a treatment plan. Treatments for myelofibrosis include:

- Androgen therapy, or treatment with a synthetic version of male hormones, which can promote red blood cell production and improve severe anemia.
- Blood transfusions, which can increase red blood cell count and ease anemia symptoms.

erative neoplasm. If you've been diagnosed with any of the following subtypes of myeloproliferative neoplasms or related conditions, we're here to help. If you don't know which type of myeloproliferative neoplasm, you have, that's okay. You can request a free consultation from our experts. Additional testing can help you determine your exact diagnosis.

- Primary myelofibrosis (also known as chronic idiopathic myelofibrosis)
- Chronic myelogenous leukemia
- Essential thrombocythemia
- Chronic neutrophilic leukemia
- Chronic eosinophilic leukemia
- Polycythemia vera
- Multiple myeloma

Your doctor will consider your age, blood cell counts, amounts of immature blood cells called blasts, as well as symptoms when devising a treatment plan.



# How Massive Bio Helps Myelofibrosis Patients

Massive Bio specializes in finding clinical trials of new treatments for myelofibrosis and related conditions. If you've been diagnosed with myelofibrosis or any other myeloproliferative neoplasm, we're here to help. That's true even if you require advanced myelofibrosis treatment or advanced blood cancer treatment for any other type of myeloproliferative disorder. If your myelofibrosis

has progressed, let us help you find the best treatment options. Using our artificial intelligence-based platform, we can match you to clinical trials of advanced myelofibrosis treatment options today. If you aren't sure if you have myelofibrosis or a related condition, that's okay. Additional testing can help determine your exact diagnosis.



**If your myelofibrosis has progressed, let us help you find the best treatment options. We can help you find advanced myelofibrosis treatment or advanced blood cancer treatment for any other type of myeloproliferative disorder.**



# WHY IS IT IMPORTANT TO PARTICIPATE IN CLINICAL TRIALS?

Clinical trials are conducted by scientists seeking new ways to prevent, detect, or treat disease and play an essential role in improving the health of current and future generations. Clinical trials offer hope for many people and an opportunity to help researchers find better treatments for others in the future. In this article, you will find answers to your questions about clinical trials.



## **What are clinical trials, and why do we need them?**

Clinical trials are scientific studies involving human volunteers that aim to obtain information about new approaches to treating disease. In some cases, existing treatments for a disease may be insufficient or cause severe side effects, so researchers develop alternative therapies, which are tested in clinical trials to find out if they are effective and safe in humans. Researchers initially enroll a few volunteers or patients to participate in early pilot studies. If a treatment seems promising, they will conduct increasingly larger-scale studies to understand its benefits and downsides.

## **Where are clinical trials conducted?**

Clinical trials are conducted at clinical research sites approved by the U.S. Food and Drug Administration that have been judged to have the personnel, equipment, and laboratory facilities necessary to ensure safety of the human volunteers and the reliability of study results. A clinical trial may include a single research center or





multiple sites, sometimes in more than one country.

**Who conducts clinical research?**

Every clinical trial has a principal investigator responsible for ensuring that the study's protocol (or study plan) is followed. The principal investigator oversees the work of co-investigators and assistants who help conduct the study. An Institutional Review Board (IRB)—which consists of doctors, scientists, and ordinary people like you—offers oversight and ensures that study participants are not exposed to unnecessary risks. The IRB regularly reviews the study, its progress, and its results.

**Is a clinical trial right for me?**

Countless clinical trials are being conducted worldwide, so it can be tremendously challenging to find the one offer-

ing a treatment that could be right for you. Massive Bio's advanced algorithms use artificial intelligence to match a patient's medical data with existing clinical trials. This way, the patient can quickly find the most appropriate clinical trial.

Clinical trials often offer a personalized treatment option for patients. Before participating in a clinical trial, you will be told what to expect as a participant, such as the treatment's possible benefits, potential side effects, or other risks. Once you have all this information, you can consider whether you want to enroll in a clinical trial. By participating in a clinical trial, you can receive potentially life-changing and even life-saving treatment and support future scientific development.

# Clinical News

## Oncology Clinical Trials: Coming Back Strong

The COVID-19 pandemic had a profound impact on all aspects of healthcare, including its effect on clinical research. Many clinical trials of experimental therapies were postponed or canceled at the height of the pandemic, and patient enrollment in ongoing studies plummeted.

However, new research published in *Annals of Oncology* found that clinical trials in oncology have bounced back.

In the study, investigators analyzed patient enrollment in trials and initiation of new studies before and after the onset of the pandemic at Dana-Farber Cancer Institute in Boston and the Tisch Cancer Institute at Mount Sinai Medical School in New York City. Compared to the period just prior to the onset of the pandemic, clinical trials at these two oncology centers experienced a 46 percent decrease in new patient accruals between March

and May 2020. Newly activated trials decreased by 24 percent.

However, thanks to vaccines and infection-prevention strategies, clinical trials have made a dramatic recovery: A year later, the number of patients recruited to trials exceeded pre-pandemic levels by nearly 3 percent, while the number of newly activated trials had increased by 30 percent. The authors stated that the use of telehealth and other adaptations has helped clinical trials recover.

## A Safer Option for Advanced Melanoma?

Earlier this year, the U.S. Food and Drug Administration (FDA) approved a new treatment for advanced melanoma called *Opdualag*, which studies indicate is less likely to cause serious side effects than previous therapies.

*Opdualag* is a combination of two drugs: nivolumab (*Opdivo*), which is already approved for treating





advanced melanoma, as well as some other cancers; and a new drug called relatlimab. Nivolumab and relatlimab are both forms of immunotherapy, which works by improving the immune system's ability to kill cancer cells. Specifically, these drugs are immune checkpoint inhibitors, which help important cancer fighters called T cells stay turned "on" and able to destroy malignant tumors. Nivolumab targets a checkpoint protein on T cells called PD-1, while relatlimab blocks a recently discovered checkpoint named LAG-3.

The study that persuaded the FDA to approve *Opdualag* included 700 patients with advanced melanoma. Half received the combination of nivolumab and relatlimab, while the other half were treated with only nivolumab. Patients who received *Opdualag* had their melanoma stabilize for 10 months, while those given only nivolumab had their cancer worsen after just four months.

This study, published in the *New England Journal of Medicine (NEJM)*, found that *Opdualag* was about as effective as another combination of drugs commonly prescribed to patients with advanced melanoma, nivolumab and ipilimumab (Yervoy). However, about one in three patients who are prescribed the latter combination quit taking it because they can't tolerate the side effects, which can include itching, skin rash, nausea, and diarrhea, as well as more serious concerns such as pneumonia and heart problems. The *NEJM* study found that fewer than one in five melanoma patients couldn't tolerate *Opdualag*. Since it appears to be significantly less toxic than nivolumab and ipilimumab, some oncologists have called *Opdualag* "a game changer."

If you have advanced melanoma, you may be a candidate for a clinical trial of other potential game-changing medications being evaluated by researchers. Massive Bio currently supports several clinical trials of novel treatments for melanoma.

Contact us today to find out if there's a clinical trial that's right for you.

#### **Can a Blood Test Detect Breast Cancer?**

Could a simple blood test replace mammograms for detecting breast cancer? Researchers from Clarkson University in Potsdam, New York, recently reported that they had identified nearly two dozen biomarkers for breast cancer in women's breast milk. A biomarker is a molecule that can be detected and measured in the blood, other bodily fluids such as breast milk, or body tissues that can indicate the presence of disease. Biomarkers are already used to detect and predict the risk for many forms of cancer.

In their study, the Clarkson University researchers obtained breast milk from three women diagnosed with breast cancer and three women who didn't have cancer. Using technology called liquid chromatography with tandem mass spectrometry, they compared the levels of specific proteins between the two groups. The comparison allowed the researchers to identify 23 proteins that behaved abnormally and had previously been shown to play a role in cancer or tumor development.

The Clarkson researchers presented their findings at the annual meeting of the American Society for Biochemistry and Molecular Biology earlier this year in Philadelphia. They will next confirm their results by studying a larger group of women. They must also determine if the same set of biomarkers can be found in blood. However, they hope one day to develop a biomarker test that could be used in addition to, or even instead of, mammograms for breast cancer screening.

Massive Bio supports several clinical trials of experimental biomarker-based therapies for various cancers that are recruiting patients. If you have a form of cancer linked to a specific biomarker, we may be able to help you find new treatment options.

# 7 QUESTIONS TO ASK ABOUT CUTANEOUS MELANOMA

Melanoma is a form of skin cancer. It occurs when cells called melanocytes, which give skin its tone, become malignant and grow uncontrollably. The malignant cells form a tumor and, in some cases, spread to other body parts.

Melanoma first appears as a change in the look or shape of a mole or area of pigmented skin. Although the five-year survival rate for melanoma is 98 percent when caught in early stages, which is exceptionally high compared to other cancer types, melanoma can be deadly if left undetected and untreated. Yet, unlike many other cancer types, melanoma is preventable, underscoring the urgency to take steps to protect your skin. In this article, we will review eight questions to help you understand more about cutaneous melanoma.

## What Is Cutaneous Melanoma?

The three general types of skin cancer are basal cell carcinoma, squamous cell carcinoma, and melanoma. The latter is the rarest of the three, yet melanoma will be the cause of 7,650 deaths in the United States in 2022, according to the American Cancer Society. Any melanoma in the skin is considered cutaneous, which accounts for more than 90 percent of all cases.

## What Is the Difference Between Cutaneous Melanoma and Melanoma?

Only a few types of melanoma are considered non-cutaneous, and they are rare compared to cutaneous melanomas, accounting for about 5 percent of cases. These cancers often occur in areas such as the eyes, the nose, mouth, rectum, or vagina. Non-cutaneous melanomas are more aggressive and challenging to treat than cutaneous melanomas.

## What Are the Subtypes of Cutaneous Melanoma?

Melanoma is most often caused by overexposure to the sun or other sources of ultraviolet rays, such as indoor tanning beds. Cutaneous melanoma can be classified into several different subtypes based on the tumor's location, appearance, and how aggressive it is. They include:

- Superficial spreading melanoma
- Lentigo maligna melanoma
- Amelanotic melanoma
- Nodular melanoma



## What Can Be Done To Reduce Your Risk of Developing Melanoma?

Some simple, commonsense steps can lower your risk for melanoma and other forms of skin cancer, including:

**Limit your sun exposure:** Avoiding the sun at midday, when its UV rays are strongest, protects the skin from damage that can increase the risk for melanoma. The American Cancer Society recommends keeping out of the sun from 10 a.m. to 4 p.m., if possible. Remember, sunlight reflects off surfaces such as sand and water, so even sitting under an umbrella at the beach can leave you exposed.

**Cover up:** When you do venture outdoors, wear long-sleeved shirts and garments that cover the legs, such as long pants or skirts, when possible. The best choices are dark-colored clothes made of tightly woven fabrics. You can also purchase specially made garments with coatings that absorb UV rays. Hats are essential, too, preferably with broad brims that provide shade for the neck and ears. Again, head coverings made with tightly woven fabrics are preferable to looser weaves, such as straw hats.



**Wear sunscreen:** Following several rules will help you get the most protection from sunscreen:

**Read the label before you buy:** Look for the phrase “broad spectrum,” which means it blocks both UVA and UVB rays. Purchase products with a sun-protection factor (SPF) number of at least 30, preferably higher.

**Don’t skimp:** Dermatologists recommend using at least an ounce (the amount that would fill a shot glass) of sunscreen to cover all your exposed body parts.

**Reapply often:** You should reapply sunscreen if you remain in the sun for more than two hours, if you go swimming, or if you perspire heavily, especially if you towel off your skin.

**Don’t use tanning beds or sun lamps:** They expose the skin to damaging UV rays. If you want to deepen your skin tone, use artificial tanning products.

#### **How Can You Tell If a Spot Is Cutaneous Melanoma?**

If you have any concerns about a mole or spot on your skin, visit your dermatologist. You should also visit your dermatologist annually for a full body exam, especially if you are at increased risk of skin cancer, in which case your doctor may want to see you more frequently. Some questions your doctor will consider when determin-

ing if a spot is cutaneous melanoma include:

- Is the mole or birthmark asymmetrical?
- Are the edges of the mole or birthmark blurred, irregular, ragged, or notched?
- Is the color consistent throughout, or does it have shades and patches of brown, black, blue, white, pink, or red?
- Is the spot bigger than one-quarter of an inch (about the width of a pencil eraser)?
- Has the mole changed its color, size, or shape?

Your doctor will perform certain tests to find out if a suspicious spot is cutaneous melanoma. Once the diagnosis is confirmed, your doctor will stage the tumor, which is the process of determining the extent of cancer. The stage of melanoma and other cancers affects the treatment options, the prognosis, and the estimated survival rate.

#### **What Is the Difference Between Cutaneous and Subcutaneous?**

Cutaneous is a term used to describe the skin. Subcutaneous refers to beneath the skin. Melanoma is only considered subcutaneous when it has spread.

#### **Where Might Cutaneous Melanoma Spread?**

Melanoma can spread to other body parts if left untreated. Melanoma may spread, or metastasize, to the lungs, liver, brain, bones, digestive system, and lymph nodes, as well as other areas of the skin.

# Non-Hodgkin Lymphoma by Numbers

Non-Hodgkin lymphoma (NHL) is one of the two major forms of lymphoma. Its cause is unknown, but NHL begins in the immune system with the proliferation of abnormal white blood cells. This article offers some basic information about NHL, then takes a closer look at the numbers: How common is this blood cancer and what's your risk?



## About Non-Hodgkin Lymphoma

Non-Hodgkin lymphoma is more common than the other major form of this cancer, called Hodgkin lymphoma. There are many subtypes of NHL, but all share similar characteristics. Generally, NHL develops in the lymph nodes, which are part of the immune system, but can spread to the stomach, small intestine, bone marrow, and skin. This malignancy may be detected in only one area or multiple regions in the body.

NHL occurs when immune cells called B cells, T cells, and natural killer cells begin growing uncontrollably. B-cell lymphoma is by far the most common form. If NHL is not treated, cancerous cells replace normal white cells, the immune system cannot provide adequate protection against infection, and the cancer can spread, or metastasize. NHL may be indolent (slow-growing) or aggressive (fast-growing).

## NHL: How Common Is It?

Approximately 2.1 percent of men and women will be diagnosed with NHL at some point during their lifetime. NHL is most often diagnosed in people aged 60 to 74 years old. It's a relatively common cancer, accounting for approximately 4 percent of all malignancies. The American Cancer Society makes the following projections for 2022:

- NHL will be diagnosed in about 80,470 people (44,120 males and 36,350 females).
- This cancer will kill approximately 20,250 people (11,700 males and 8,550 females).

Overall, a man's lifetime risk of developing NHL is about 1 in 42, while a woman's risk is about 1 in 52. However, a variety of risk factors can influence a person's risk. While adults make up most cases, NHL may strike at any age. It is, in fact, one of the most frequent cancers among children, adolescents, and young people. However, the risk for NHL grows with age, with more than half of patients aged 65 or older at the time of diagnosis. The aging of the American population will likely lead to an increase in NHL cases in the coming years.

## Surviving NHL

NHL is the ninth-leading cause of death from cancer in both men and women in the United States. Thanks to advancements in treatment, however, the survival rate for NHL patients has improved since 1997. From 2009 through 2018, the death rate fell by 2 percent every year. A cancer's five-year survival rate indicates the percentage of people living for at least five years after diagnosis. Overall, the five-year survival rate for NHL patients is 73 percent. However,

**It's a long road,  
but not a lonely one.**

## **Free Clinical Trial Matching Service for Advanced Lymphoma Patients.**



survival rates vary depending on the stage (or extent) of the cancer at diagnosis. The five-year survival rates for the different stages of NHL are:

- Stage I:** more than 83 percent
- Stage II:** close to 76 percent
- Stage III:** more than 70 percent
- Stage IV:** roughly 63 percent

These survival rates vary depending on can-

cer's stage and subtype. It is important to remember that statistics on NHL survival rates are only estimates. The estimate is based on annual data on the number of people diagnosed with this cancer in the United States. Experts also assess survival rates every five years. As a result, the estimate may not reflect the effects of recent improvements in diagnosis and treatment of NHL.

# OBESITY AND PROSTATE CANCER

The obesity epidemic is spreading around the world, increasing the risk for certain diseases, while making others harder to treat. That list includes prostate cancer, which is diagnosed in about one in eight men in the United States. Some, though not all, studies indicate that overweight and obese men have an increased risk for prostate cancer.

However, research offers convincing evidence that men who carry too much body fat and develop prostate cancer often have highly aggressive forms of the disease that are more challenging to treat and can turn fatal.

Scientists are trying to understand why obesity might make prostate cancer more likely and lethal, but here's what's known so far about the association between these two diseases.

## **Obesity and Prostate Cancer: What's the Link?**

Obesity is an excess accumulation of body fat that can pose a risk to health. More than one third of Americans are obese, which is defined as having a body mass index (BMI) of 30 or higher. (BMI is calculated using a person's weight in kilograms divided by height in meters squared.) A similar portion of Americans are overweight, meaning their BMI is between 25 and 30. Evidence suggests that abdominal

obesity—that is, a thick pad of fat on the waistline—is especially unhealthy.

Prostate cancer occurs when cells in the prostate, a walnut-shaped gland just below the bladder, turn abnormal and grow uncontrollably. Prostate cancer is often detected early, when it responds well to treatment. However, this cancer can spread to other organs and turn deadly.

Why might obesity increase the risk for prostate cancer and make it harder to treat? Scientists aren't sure, but several theories have emerged recently. Some researchers point out that body fat is highly active tissue that produces lots of substances, including molecules called adipokines that promote low-grade chronic inflammation. That could interfere with the body's natural ability to fight cancer, which could promote growth of prostate tumors. Other scientists theorize that diets rich in sugary foods, which can







increase body weight, may feed the growth and spread of prostate tumors.

#### What Studies Show

While scientists aren't sure why obesity might promote prostate cancer and make it more dangerous, there's solid data indicating that men diagnosed with this malignancy who carry too much weight have worse outcomes.

For example, several studies have found that obese men who undergo surgery (known as prostatectomy) for prostate cancer are significantly more likely than non-obese males to experience a recurrence of the disease. In one, published in the journal *Urology* in 2005, prostate cancer patients with a BMI of 35 or higher had a 69 percent increased risk for recurrence.

That suggests that overweight and obese men develop more aggressive forms of prostate cancer that can place their lives at risk, which is supported by other research. In the largest study of its kind, published in 2022 in the journal *BMC Medicine*, researchers found that every four inches (roughly 10 centimeters) a man adds to his waist circumference is associated with a 7 percent increased risk of dying from prostate cancer.

#### Weight Loss and Diet Changes

Many doctors who treat prostate cancer are so convinced that excess body fat makes the disease worse that their first order to overweight or obese patients is: You have to lose weight. Exercising regularly is a must, but to achieve significant weight loss, cutting calories is the most important step.

What should you eat? Studies suggest that a typical Western-style diet rich in red meat and high in unhealthy fats and sugar may promote prostate cancer. A 2022 analysis in the journal *Prostate Cancer and Prostatic Diseases* found that plant-based diets may lower the risk for this form of cancer. If that's too extreme, researchers at M.D. Anderson Cancer Center, in Houston, Texas, have found that adopting a Mediterranean-style may slow the progression of prostate cancer. A Mediterranean-style diet includes relatively little red meat, full-fat dairy foods, and sugary or salty snacks. Instead, it features plenty of fish, vegetables, fruit, nuts, and olive oil. However, there is no single "best" diet for shedding pounds, so work with a dietitian to find a plan that allows you to continue eating food you enjoy while reducing your calorie intake.



# COPING WITH HER2-POSITIVE BREAST CANCER

According to the World Health Organization, 2.3 million patients were diagnosed with breast cancer in 2020 around the globe, accounting for 685,000 deaths. A significant portion of women diagnosed with this common malignancy are HER2-positive (sometimes described as HER2+), which means they produce high levels of a protein that promotes breast cancer. In the United States, 18 out of every 100 breast cancer patients diagnosed between 2014 and 2019 were found to be HER2-positive.

The journey from diagnosis to treatment is difficult for any cancer patient, but developing coping tools and strategies can help you manage the disease. In this article, we will focus on how to cope with HER2-positive breast cancer and remind patients that they are not alone in their journey.

## What Is HER2-Positive Breast Cancer?

Human epidermal growth factor receptor 2 (HER2) is a protein that helps regulate cell growth, division, and repair. HER2-positive breast cancer is diagnosed when levels of these proteins are elevated. This form of the disease is typically fast growing and spreads more rapidly than other types of breast cancer. The HER2 protein has been associated with other cancer types, as well, including bladder, ovarian, pancreatic, and stomach cancers.

## How to Cope With Emotional Side Effects

Many patients say they were shocked to learn they have breast cancer. Breasts are what many women associate with the essence of their femininity. That is why patients often call the diagnosis life-changing, since it brings up the possibility of losing their breasts.

On the other hand, there are financial concerns and worries about whether treatment will work. However, there is room for optimism. While HER2-positive breast cancer was once a challenge to treat, the arrival of targeted therapies has dramatically improved survival rates, which are relatively high compared to other types of cancer.

The stage of the disease, your level of fitness, and whether you had previous treatment or not will also





have a significant effect on your prognosis.

Now let's go over some tips on how to cope with HER2-positive breast cancer.

- **It is okay to have emotions:** Recognize and acknowledge the validity of your feelings. You are entitled to feel up or down about what you are going through. You might start to experience opposite emotions one after another, such as anger after hope, and resentment after guilt. There is no right or wrong about it. This is how your mind and heart adapt to the new situation you are experiencing. Once you have a treatment planned, you will feel more in control, and your emotions will quiet down.

- **Talk about your feelings:** Having all those emotions alone and not sharing them might double their effect. So, try to express them to your family, friends, or, if you prefer privacy, to professionals. Choose a channel to start communicating and getting a sense of control over what you feel.

- **Take a break from cancer:** It creates stress and physical side effects. Consult your doctor and learn what kind of physical activities suit your situation. Once you know it won't hurt you, you might see yourself finding a calming escape from cancer by just focusing on a physical activity, such as taking a brisk walk or swimming, that occupies your mind, as well as your body.

- **Overcome loneliness:** Remember, there are many others who are going through the same experience. Finding a support group, coming together with them, sharing experiences, hearing about their journeys, and learning that you are not alone can have a positive impact.

#### How to Find Breast Cancer Support Groups

Your healthcare team may be able to recommend a sup-

port group. You can also find options by searching online. You can limit your search by location or by Googling "How can I find a breast cancer support group?"

#### How to Cope With Physical Side Effects

Physical side effects might include fatigue, hair loss, and hot flashes. For fatigue, getting plenty of good-quality sleep, practicing meditation, and following a healthy diet are advised. To reduce hair loss due to chemotherapy, cooling caps, also called scalp hypothermia, might help. If you develop hot flashes and perspire, avoiding spicy food and caffeine might be worth trying. In addition, wear layers, which you can remove one at a time when you feel hot or start sweating. If these strategies are not enough, your physician might prescribe you medication.

If you undergo mastectomy, the significant physical change might alienate you to your own body and cause you to lose self-esteem. While some patients opt for plastic surgery, others prefer making peace with the new terms. Give yourself some time to figure out which works best for you.

#### Preserving Mental Health During Treatment

Seeking professional counseling to keep your mental health in check is a great start to taking control of your emotions. That could mean consulting with a healthcare professional such as your physician, oncology nurse, or mental health professional. Although many people suffer from this disease, some of your problems are unique to you. These healthcare professionals are ready to support you. Do not hesitate to share your concerns and ask for advice.

# “SYNERGY-AI” BRINGING CANCER PATIENTS TOGETHER WITH CLINICAL TRIALS

According to the World Health Organization (WHO), cancer is the second most common cause of death worldwide. While 20 million people, including about 400,000 children, are diagnosed with cancer each year, and approximately 10 million people die due to cancer.

The increase in cases, especially in recent years, has changed the perspective on cancer treatment strategies. It is now even more critical to develop new-generation treatments to prevent and treat cancer, as well as improve patients' quality of life. Toward those goals, hundreds of clinical trials are being conducted worldwide in the quest for new cancer treatments. Crucially, people with cancer who may benefit from these experimental therapies need access to them, yet matching patients to trials is complex and laborious. But technology can save lives. Massive Bio is uniquely positioned to take on this role with our one-of-a-kind artificial intelligence (AI) platform.

#### **The World's Only Biotechnology Application Offering Personalized Service: SYNERGY-AI**

Massive Bio, the only company in the biotechnology industry with an oncology-focused AI program, brings cancer patients together with clinical studies, no matter where they live in the world or their financial circumstances. With the SYNERGY-AI mobile phone application, cancer patients enter their information into the system and Massive Bio's AI algorithms match them to the most appropriate treatment method and the nearest clinical research center. SYNERGY-AI's personalized, seamless, evidence-based service lets cancer patients access the most appropriate clinical trials without waiting years to find the right one and be enrolled.

#### **How Does SYNERGY-AI Work?**

SYNERGY-AI gives cancer patients access to new and tailored treatment options that are being evaluated prior to being submitted for approval by the United States Food and Drug Administration (FDA) and regulators in other countries. Using information such as cancer type, stage, and biomarker status enables SYNERGY-AI to match the patient to eligible clinical trials in the closest location.

Thanks to SYNERGY-AI's algorithms, when patients enter their information into the system, cancer genomics matches more than 30,000 active clinical trials and works in real time to determine whether the patient is suitable for the clinical trial. When the patient is compared with the clinical trial, it also uses an application integrated with AI and mobile technology to direct the patient to the nearest clinical research center.

SYNERGY-AI is available in English, Spanish, French, Greek, Romanian, Polish, Portuguese, German, Italian, and Hebrew. The application is free and can be used on both Android and iOS-based mobile phones.



9:41

Refer a Patient

### Refer a Patient

Start Your Clinical Trial Journey

Patient Name\*      Patient Last name\*

Name      Lastname

Email Address

Email Address

Gender

Select

Date of Birth\*

mm/dd/yyyy

Clinical Trials

Select

Continue

9:41

MASSIVEBIO

### Clinical Trials

**C-750-01/GOG-3028**

Cervical Cancer type      Agenus Inc. Sponsor

Niraparib +2 Drug      Phase 2 Phase

Details >

**FOENIX-BMC2 TAS-120-201**

Breast Cancer type      Taiho Oncology, Inc. Sponsor

Fulvestrant Drug      Phase 2 Phase

Details >

**R5093-ONC-1863**

Refer a Patient

Cancer type      Sponsor

Clinical Trials      My Patients      Support      Profile

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# *Just Do It:* Why Cancer Patients Should Exercise



For many years, doctors gave cancer patients stern advice: You need to rest and take it easy. However, a growing number of doctors today are telling patients to keep moving as much as possible, thanks to mounting scientific evidence indicating that people with cancer benefit from physical activity. Studies show that patients who remain active manage their symptoms better, experience milder side effects from treatment, and recover faster.

Even more exciting, there's now solid research showing that exercise reduces the risk for many forms of cancer, while lowering the odds of dying if you are diagnosed with certain forms of the disease. Research on the link between physical activity and cancer has led to the creation of a new field of study, known as exercise oncology.

The idea of getting cancer patients to exercise is usually traced to a series of studies conducted at Ohio State University in the 1980s, which showed that breast cancer patients undergoing chemotherapy who exercised regu-

larly had reduced fatigue, nausea, and disability from the treatments.

The surprising results of the Ohio State study inspired more research, and the evidence supporting the theory that cancer patients benefit from physical activity has been building ever since. In 2019, an international panel of experts determined that cancer patients who exercise during and after treatment experience less fatigue, anxiety, and depression, and have better quality of life.



The expert panel also found evidence that exercising can reduce the risk for many malignancies, including bladder, breast, colon, endometrial, esophageal, kidney, and stomach cancers. Evidence also suggests that it may help fight lung, blood, head and neck, ovarian, pancreatic, and prostate cancers. What's more, patients with breast, colorectal, and prostate cancers who exercise regularly slash their risk for dying by 40 to 50 percent, the expert panel found. Why might exercise help prevent cancer and make it easier to manage? Doctors point out that physical activity reduces levels of inflammation and insulin, which are both linked to some cancers. Also, exercise helps create new blood vessels, which may help chemotherapy and other anti-cancer medicines reach and destroy malignant tumors.

Also, research suggests that exercise strengthens the immune system, which is weakened by cancer. Yet recent research at the Nyberg Human Cellular Therapy Laboratory at the Mayo Clinic's Arizona campus showed that pedaling full-speed on a stationary bike for 10 minutes produces up to a 10-fold increase in cancer fighters called natural killer cells, as well as protective T cells and B cells.

Other experts point out that burning calories also sheds body fat, which could be important for several reasons. First, body fat makes the hormone estrogen, which can promote some forms of breast cancer. Also, for women who develop breast cancer, some therapies can cause weight gain. Studies have found that women undergoing treatment for breast cancer who get some form of regular aerobic exercise (such as jogging or cycling) have reduced body fat and improved self-esteem. Meanwhile, lifting weights and other forms of strength training help build muscle and increase a patient's likelihood of completing her treatment regimen.

Cancer patients don't need to run marathons or pump iron to benefit from exercise. Simply taking a daily walk can help. Aim for 150 minutes of per week, if you can, and try to keep up a brisk pace—you should be able to talk, but not sing. If you are currently receiving cancer therapy, there may be days when you don't have the energy or desire to exercise. But on your "good" days, getting up off the sofa, lacing up your walking shoes, and taking a healthy stroll can be an important ally in the fight against cancer.

# PATIENT ADVOCACY GROUPS

Massive Bio is building strong relationships with leading cancer advocacy organizations. These organizations provide key resources and services to people dealing with cancer diagnoses. Partnerships with these advocacy organizations allow Massive Bio to provide comprehensive support experience for patients and their families.

## **Meet Malecare**

Malecare is a men's cancer survivor support and advocacy group, offering Massive Bio's Molecular Oncology Advisory service to prostate cancer patients. The partnership has created further awareness of the value added by molecular profiling, especially in late-stage treatment settings where standards of treatment are not well defined.

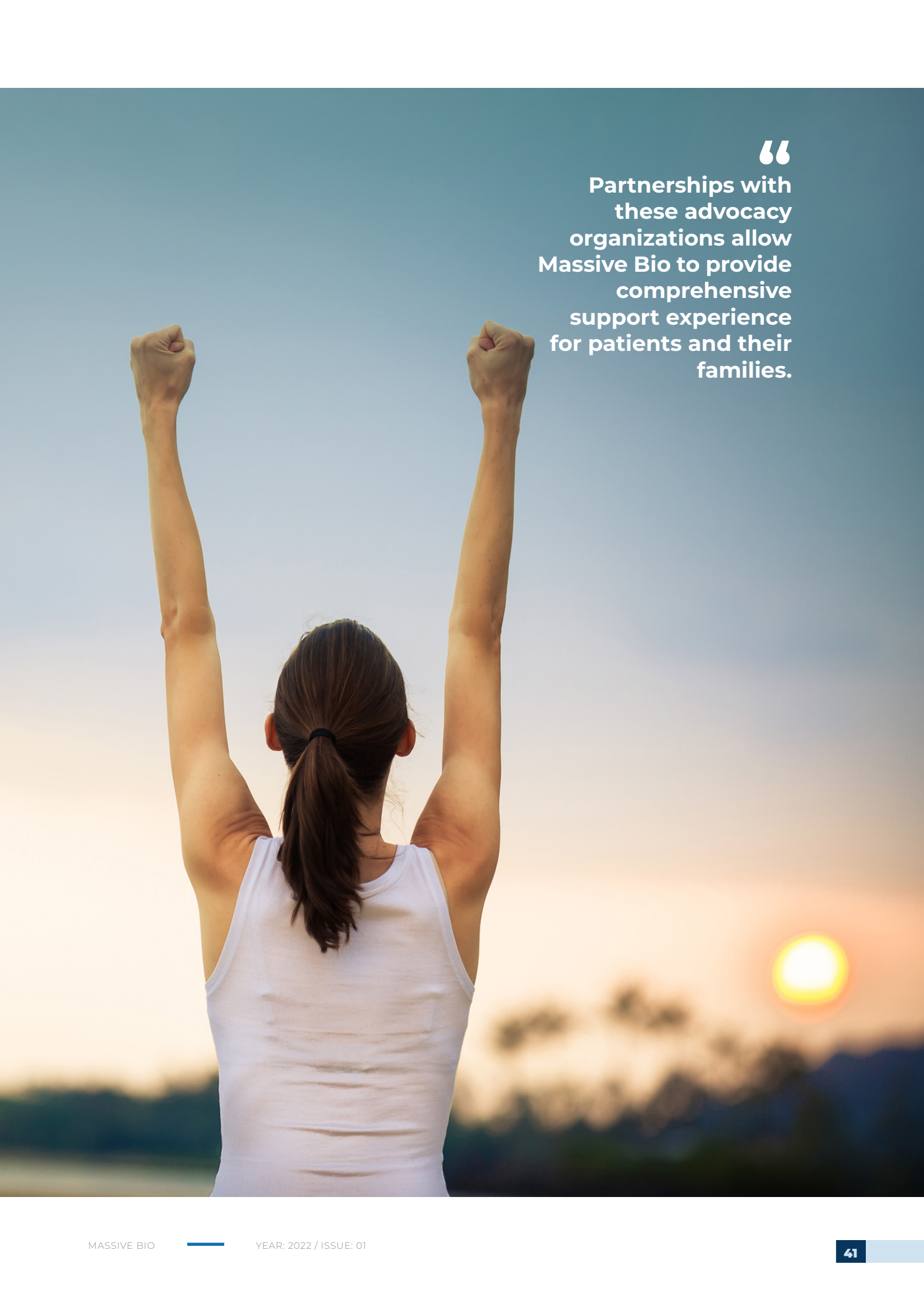
"Precision oncology is a new world for patients where patients are presented with lots of different treatment choices, especially for advanced-stage patients. Still, they don't know what precision oncology is," says Darrell Mitteldorf, executive director of Malecare (malecare.org). "Massive Bio helps translate that term into something practical. And through our Malecare Prostate Cancer Support Group Net-

work, we've collaborated with Massive Bio to help patients make better treatment choices. So, Massive Bio and Malecare Cancer Support collaborated to bring precision oncology, understanding, and treatment opportunities to over 200 of our patients nationwide in the United States. We've been able to gather feedback from each of them, and it's been positive. Patients are getting better treatment opportunities, the families are happier, and the patients themselves are happier because they feel more confident in the choices that they've made and in the treatment that they are getting from here out."

## **Meet ALK Positive**

ALK Positive is a patient-driven organization dedicated to improving the lives of ALK-positive patients. The organization consists of more than 2,000 ALK-positive lung cancer patients and their caregivers in over 50 countries. Through their foundational online support group, members of ALK-positive are able to support each other worldwide and share information to help them become empowered patients-advocates. Massive Bio supports the efforts of ALK-Positive in the fight against lung cancer.



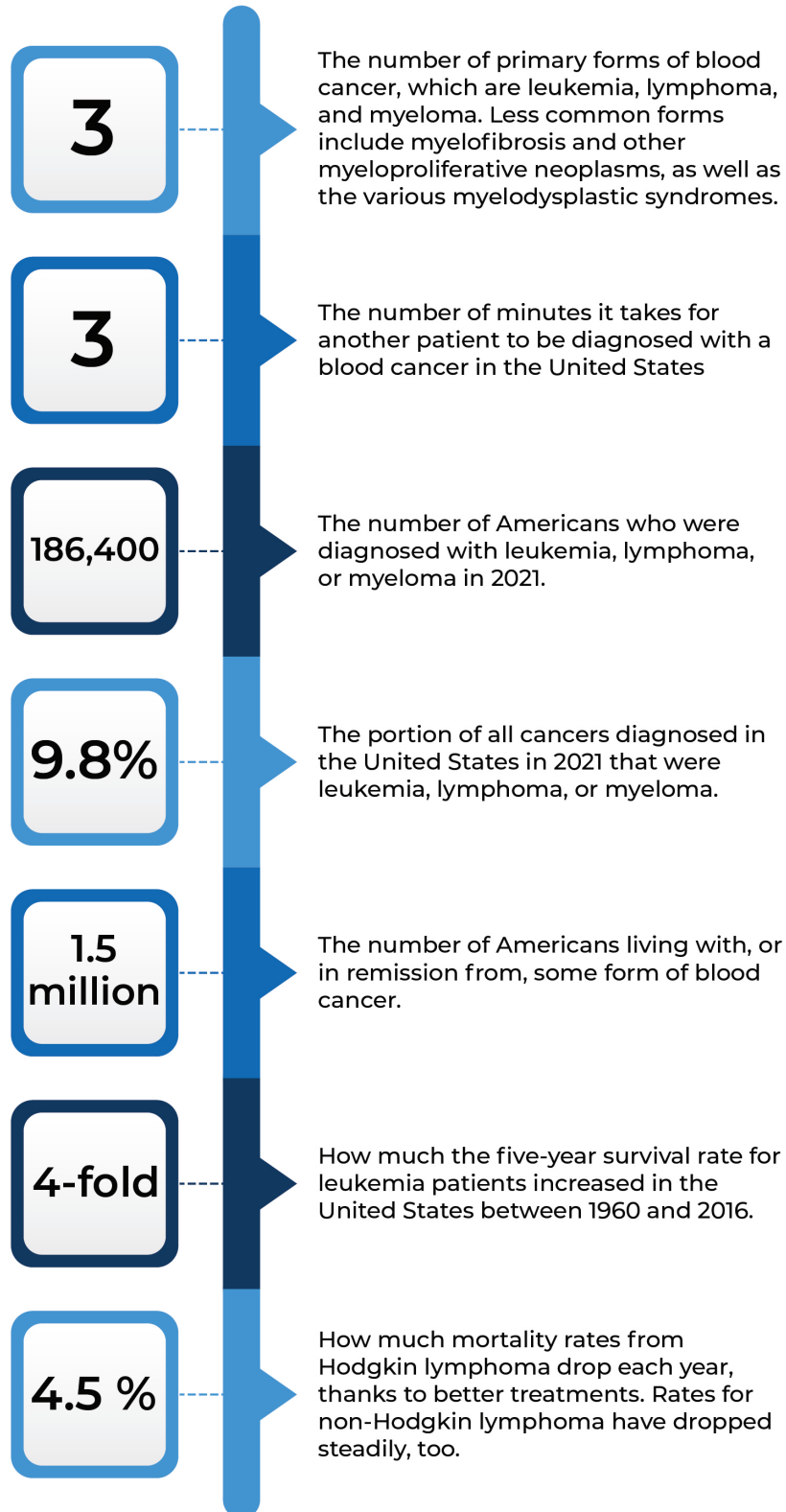


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Partnerships with these advocacy organizations allow Massive Bio to provide comprehensive support experience for patients and their families.

# NEW RESEARCH

## Cancer Statistics: Blood Cancers by the Numbers



Source: *The Leukemia & Lymphoma Society*

# HEALTH TECHNOLOGY



## It's All on the Wrist: 'Smart' Watches and Other Wearable Tech Are Improving Cancer Outcomes

If you wear a Fitbit or any other type of “smart” wristband, you might use it to track your daily steps, as well as check the time or temperature. But for a growing number of scientists, as well as some oncologists, wearable technology such as smart wristbands can provide real-time, real-world data about patients that many believe can improve cancer care.

A smart wristband is a form of wearable technology that has a special sensor that can record data about the user. Wearable tech is not a new idea—physicians have been using Holter monitors, which strap around the chest, to monitor patients' heart rhythm outside the doctor's office



for many years. And clinical researchers have long used devices called accelerometers to track the physical activity of study volunteers. However, smart wristbands, which are as easy to use as slipping on a wristwatch, have become highly popular: About one in five Americans wears a smartwatch, according to the Pew Research Center.

Smart wristbands have become popular with researchers, too. Scientists conducting clinical trials of new cancer therapies ask study volunteers to use this form of wearable tech so that they can monitor and track various types of information, such as patients' heart and breathing

rate, level of physical activity, how much they sleep, and their skin temperature. This and other data collected by a smart wristband can give pharmaceutical developers valuable information about how patients respond to new experimental therapies.

Wearing a smart wristband encourages people to get more physical activity, which helps patients manage cancer better. In one recent study, researchers at Montefiore Einstein Cancer Center in the Bronx, New York, gave smart wristbands to patients receiving radiation for

several different cancers. They found that every 1,000 steps a patient took daily reduced the need for hospitalization by 38 percent.

Wearables could also help doctors plan the ideal treatment regimen for patients. In general, a patient who is physically active will be better able to handle aggressive chemotherapy or other treatment than a patient who is relatively inactive. Unfortunately, studies indicate that simply asking a patient about his or her activity level may not provide accurate information.



As a result, patients may receive more medicine than their body can handle, or a dose that's too small. In a 2021 study published in *JCO Clinical Cancer Informatics*, researchers at the University of Southern California gave 41 cancer patients wristbands that tracked their steps, heart rate and how many calories they burned. They found that patients with the least physical activity were most likely to need unplanned medical care, such as visits to an emergency room. Having that data in advance could have helped doctors ad-

just medication dose for less-active patients, and prevented medical emergencies.

Not everyone likes wearing a wristwatch, and researchers say that can be a problem in studies—certain patients either forget or refuse to strap on their wearable tech. However, some oncologists predict that many, if not most, cancer patients will soon be instructed to wear a smart wristband in order to collect the accurate, up-to-date data doctors need to provide the best care.





Wearing a smart wristband encourages people to get more physical activity, which helps patients manage cancer better.



# Colorectal Cancer FAQ's

Being diagnosed with colorectal cancer can come as a shock and be quite upsetting. Asking questions about your cancer can help you understand more about your disease and what you can expect.

In this article, we will answer some of the most frequently asked questions about colorectal cancer.

## What Is Colorectal Cancer?

Colorectal cancer occurs in the colon and rectum. This disease starts with small growths called polyps in the lining of the colon and rectum that can turn into cancer. Colorectal cancer may also be called colon cancer or rectal cancer, depending on where the disease starts.

## What Causes Colorectal Cancer?

No one is sure what causes colorectal cancer, but researchers have learned a great deal about the common features of people who develop the disease, known as risk factors. For example, certain gene mutations (both inherited from parents and acquired after birth) have been linked to colorectal cancer. Obesity appears to be a risk factor, too. Smoking tobacco, lack of physical activity, and unhealthy diets may also increase the risk of colorectal cancer.

## How Common Is Colorectal Cancer?

In the United States, colorectal cancer is the third most common cancer type and the second-leading cause of cancer death. The American Cancer Society estimates that there are over 106,000 new cases of colon cancer and nearly 45,000 new cases of rectal cancer in the United States each year. More than 52,000 people die of the disease annually.

## Who Is at Risk for Colorectal Cancer?

About one in four Americans have risk factors for colorectal cancer. You may be at increased risk for this disease if:

- You're over age 50
- You have a family history of colorectal cancer, especially among members of your immediate family
- You have a history of pre-cancerous polyps
- You're overweight or obese
- You eat an unhealthy diet, especially large amounts of red meat or fried foods
- You smoke tobacco or abuse alcohol
- You have inflammatory bowel disease (Crohn's disease or ulcerative colitis)
- You are African American or of Ashkenazi Jewish heritage
- You have certain other diseases, such as type 2 diabetes

## How Can You Prevent Colorectal Cancer?

There are several steps you can take to lower your risk for developing colorectal cancer. First, ask your primary care physician how frequently you should be screened for the disease. Removing pre-cancerous polyps detected through routine screening can prevent colorectal cancer from developing. How often your doctor recommends screening will depend on your risk for colorectal cancer, the type of screening test, and other factors.

Other tips for preventing colorectal cancer include:

- Eat a balanced diet that includes plenty of fiber, fruits, and vegetables
- Reduce your intake of animal fats, such as from meat and dairy foods
- Replace refined grains with whole grains
- Exercise regularly
- Don't smoke and avoid second-hand cigarette smoke

- Limit consumption of alcohol

Most people should start getting screened for colorectal cancer at age 45, according to the American Cancer Society, though your doctor might recommend starting earlier, depending on your risk factors.

### **What Are the Signs and Symptoms of Colorectal Cancer?**

Colorectal cancer usually does not cause symptoms in the early stages. When symptoms begin, they may include the following:

- Changes in bowel habits, such as diarrhea, constipation, or thin stools, which persist
- A feeling that the bowels are not emptying properly
- Abdominal pain and bloating, or a persistent feeling of fullness
- Blood in the stool
- Unintended weight loss
- Fatigue, dizziness, and shortness of breath

Tell your doctor if you develop these symptoms and they don't go away. Some patients will experience no symptoms from colorectal cancer until it has reached an advanced stage. That's why routine screening is so important.

### **What Are Colorectal Cancer Clinical Trials?**

Clinical trials are research studies that evaluate new therapies and drugs for treating cancer and other diseases. If clinical trials demonstrate that an experimental treatment is safe and

effective, it can be approved for use by the U.S. Food and Drug Administration and regulators in other countries. All drugs and therapies used in medicine had to pass through the clinical trial process before being approved and used to treat illness and disease. Massive Bio specializes in finding clinical trial treatments for every colorectal cancer stage and type. If you've been diagnosed with any form of colorectal cancer, we're here to help. If you don't know which type of colorectal cancer you have, that's okay. Additional testing can help determine your exact diagnosis.

### **Can Women Get Colorectal Cancer?**

Colorectal cancer is the third most common cancer in women. An estimated 70,000 new cases of colorectal cancer are diagnosed in women each year in the United States. At age 50, a woman's risk for colorectal cancer is nearly the same as a man's risk.

### **Is Colorectal Cancer Hereditary?**

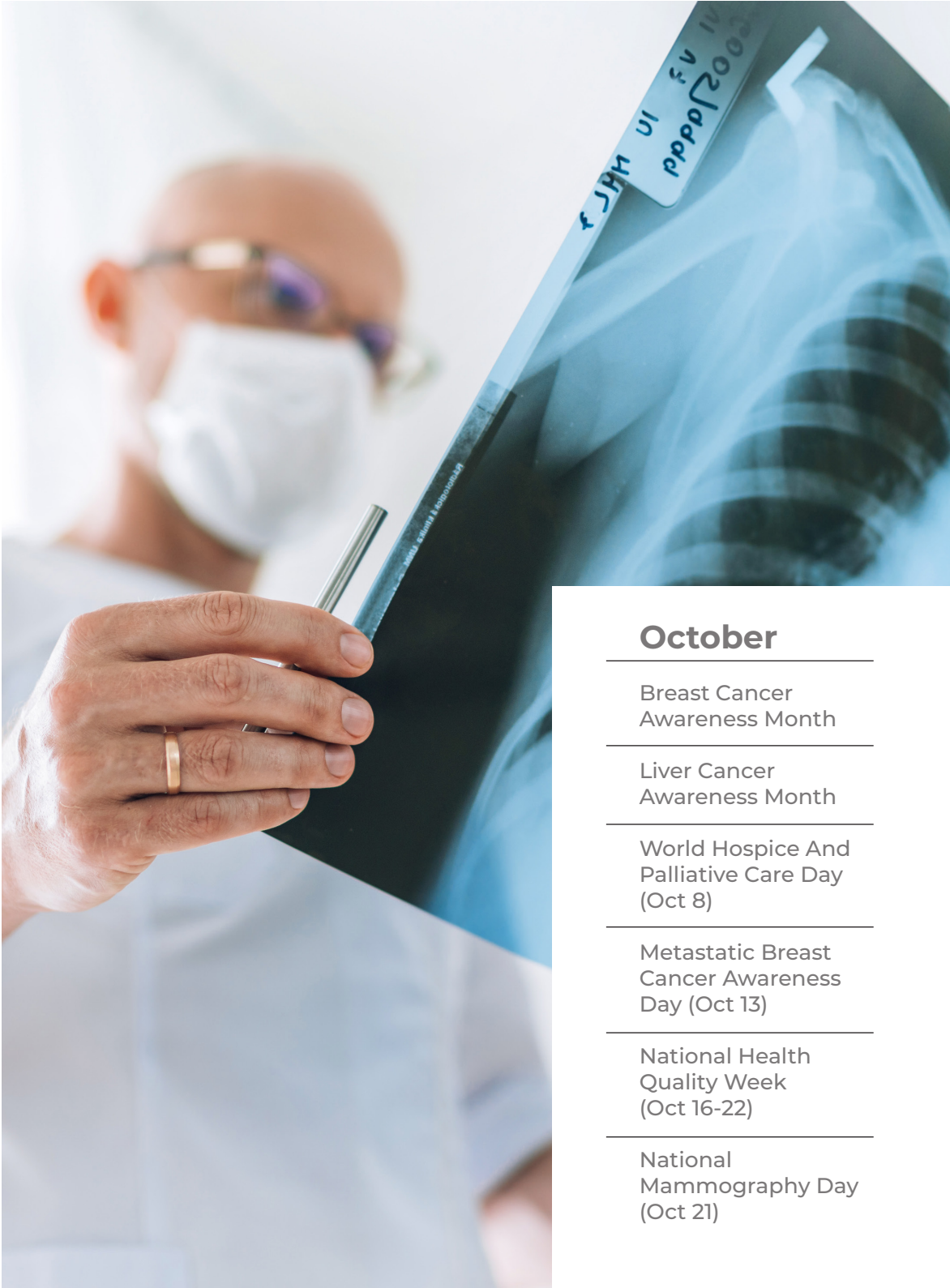
Having an increased risk for a disease can be hereditary, that is, passed down from generation to generation due to gene mutations that a child inherits from his or her parents. (Gene mutations can also be somatic, that is, acquired after birth from lifestyle and other external factors.) While the risk for colon cancer rises with age, a hereditary syndrome is likely the cause when the disease is diagnosed in a person under 50. Only five percent of colorectal cancer cases are linked to inherited gene mutations. However, one in three colorectal cancer patients have someone in their family who also had the disease. Researchers continue to evaluate gene mutations associated with colorectal cancer and how to detect them in clinical trials.



No one is sure what causes colorectal cancer, but researchers have learned a great deal about the common features of people who develop the disease, known as risk factors.



# AWARENESS CALENDAR



## October

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Breast Cancer  
Awareness Month

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Liver Cancer  
Awareness Month

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World Hospice And  
Palliative Care Day  
(Oct 8)

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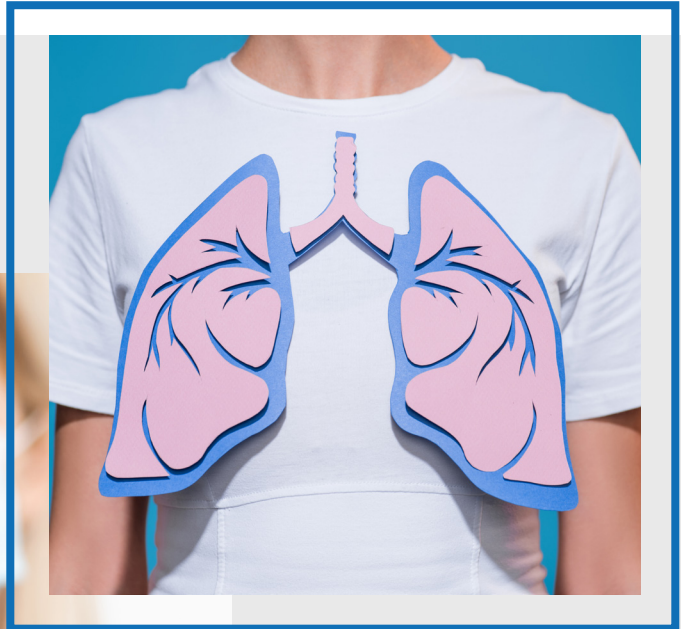
Metastatic Breast  
Cancer Awareness  
Day (Oct 13)

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National Health  
Quality Week  
(Oct 16-22)

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National  
Mammography Day  
(Oct 21)



## November

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Carcinoid Cancer Awareness Month

Lung Cancer Awareness Month

National Family Caregivers Month

Hospice and Palliative Care Month

National Marrow Awareness Month

Pancreatic Cancer Awareness Month

Stomach Cancer Awareness Month

World Neuroendocrine Tumor (NET) Day (Nov 10)

Great American Smokeout Day (Nov 17)

World Pancreatic Cancer Day (Nov 17)

## December

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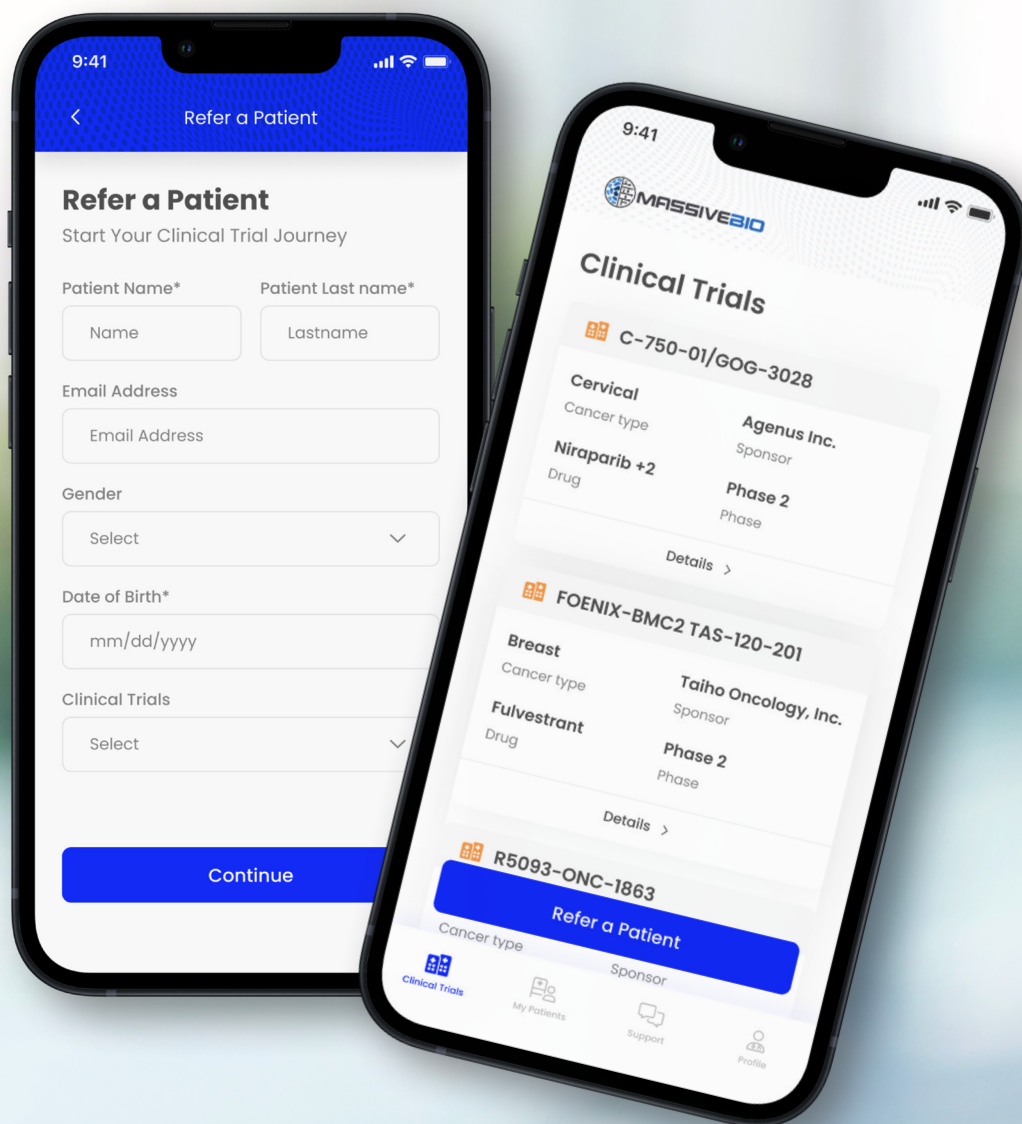
World Aids Day (Dec 1)

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National Influenza Immunization Week (Dec 6-12)

# AI finds the right trials for you.

SYNERGY-AI offers a personalized, hassle-free, evidence-based clinical trial matching service to cancer patients. No one should fight cancer alone.



SYNERGY-AI Cancer Clinical Trial Finder is a mobile app that uses your cancer type, stage, biomarker status, and other data points to identify clinical trials of cutting-edge treatments, at research sites near you. Contact us about enrolling in a clinical trial and let Massive Bio do the rest.