INSIDE: In-depth coverage of 2016 clinical trials, treatments, collaborations, opinions, and more!
With that, we wish to thank you for the opportunity to serve you and look next year. Please consider participating as much as you can.

In addition to the in-depth coverage of clinical trials, this newsletter also includes information about our upcoming events such as Mesothelioma Awareness Day on September 26, our San Francisco and Chicago conferences on September 16 and October 7, respectively, and our Symposium in March of 2017.

With that mind, we have reached out to several experts and have asked them to help us shed light on some of the most frequently discussed questions and concepts currently seen in clinical trials. We hope you find this information useful.

As we, as an organization, continue funding research and continue our focus on accelerating the development of effective treatments, patients and their families remain front and center in our work. Depicted in our cover story is one such family that generously shared their moving story with us and our readers.

By Tobias Peikert, MD
Mayo Clinic

In light of the rapidly evolving advances in cancer therapeutics across various malignancies, I am envisioning that the SAB can help guide the Meso Foundation’s efforts to promote clinical research collaborations between international centers of excellence in the field of mesothelioma to facilitate the rapid translation of mesothelioma relevant exciting advances into multi-site clinical trials, support continued advances in the Staging system and development of predictive biomarkers to strive towards stratified care for mesothelioma patients.

In summary, I am very honored to serve as the chair of the SAB and hope that our team will continue to scientifically support the efforts of the Meso Foundation to cure this devastating disease.
WHAT CLINICAL TRIALS ARE CURRENTLY AVAILABLE AND HOW DO THEY ATTACK MESOThELiOMA?

With only one FDA-approved treatment, mesothelioma patients rely on clinical trials for treatment. Currently, there are a number of promising therapies being tested in a clinical trial setting, offering mesothelioma patients choice, but also difficult decisions.

By Mary Hesdorffer, NP
Mesothelioma Applied Research Foundation

There are many promising therapies under investigation in malignant mesothelioma, and here we will introduce you to some of the strategies being used. Our own personal cancer moonshot is underway with more drug trials than ever before and with unexpected responses being observed in a subset of the mesothelioma population.

A randomized controlled trial of 448 newly diagnosed pleural mesothelioma patients demonstrated a statistically significant increase in overall survival when bevacizumab was added to pemetrexed and cisplatin. Bevacizumab is a vascular endothelial growth inhibitor (VEGF inhibitor) that prevents angiogenesis, which is the formation of new blood vessels used to feed tumors the nutrients they need for continued growth. Thus, VEGF inhibitors starve tumors of these nutrients.

Unfortunately, since this trial was conducted in Europe, the approval process in the United States is a bit more complicated. Though not currently approved by the FDA, the National Comprehensive Cancer Network (NCCN) has added this combination to its guidelines for malignant mesothelioma. This is important, as most insurance companies follow these guidelines when reimbursing for cancer care.

Another drug in this class is nintedanib, an oral drug that inhibits VEGF, platelet derived growth factor (PDGF-FR), and fibroblast growth factor (FGFR). These three factors are thought to be responsible for sustaining tumors, tumor growth, and the cancer’s ability to metastasize.

A randomized placebo controlled global trial is currently underway to determine if adding nintedanib to the current first line approved combination of pemetrexed and cisplatin is superior to pemetrexed and cisplatin plus a placebo.

Checkpoint inhibitors

While current trials are testing the use of checkpoint inhibitors as a form of immunotherapy. Such cancer immunotherapy strategies tested in the clinic have typically been aimed at stimulating a T-cell response against specific tumor antigens. There are two types of T-cells. Killer T-cells are able to see inside our bodies own cells simply by scanning their surface. This mechanism allows killer T-cells to hunt down and destroy cells that are infected with germs or that have become cancerous. The other main type of T-cells is called helper T-cells. Helper T-cells orchestrate an immune response and play important roles in all arms of immunity.

One reason these prior approaches, including therapeutic cancer vaccines, have not generally been successful is that T-cells have “checkpoints,” such as PD-1 and CTLA-4, to guard against autoimmunity and to protect tissues from damage by an overly enthusiastic immune response. We are now testing PD1/PDL1 and CTLA-4 inhibitors to stop the immune system from protecting cancer cells, essentially taking the brakes off the immune system.

In these such agents, including pembrolizumab, avelumab, atezolizumab, tremelimumab and ipilimumab, are currently in testing or have recently been tested in malignant mesothelioma. Though some studies have not reported favorable results, these immunotherapies will continue to be tested in clinic as we continue to gain further understanding of how best to use them. We may see them used in the newly diagnosed, after surgery to prevent the return of cancer, in the metastatic setting, and/or combined with others in this class of drugs, such as CTLA-4 plus PDL1, CTLA-4 plus a MTOR inhibitor (LY3023414), or even in conjunction with chemotherapy.

Mesothelin Directed Therapy

There are also clinical trials designed to target mesothelin. Mesothelin is a protein found on the outside of epithelial mesothelioma cells, which was discovered at the National Cancer Institute and developed by a team of scientists, including our past Science Advisory Board Chair Dr. Raffi Hassan. This has been an exciting breakthrough in mesothelioma, resulting in a number of clinical trials being developed to exploit mesothelin as a target.

Immunotoxins use mesothelin to gain access to mesothelioma cells and deliver a toxin directly into the tumor, thus sparing many of the systemic side effects observed in traditional chemotherapy. SS1P, pioneered at the NCI, has demonstrated activity in mesothelioma and a new trial has been launched to build upon the knowledge acquired in the earlier clinic trials. Amatuximab, a monoclonal drug antibody that targets mesothelin, is now being tested in a randomized global clinical trial that is testing pemetrexed and cisplatin plus amatuximab vs. pemetrexed and cisplatin plus a placebo.

The purpose of this trial is to determine if adding amatuximab to our current FDA approved regimen is better than the standard treatment. Avelumab ravtansine, an antibody drug conjugate that targets mesothelin, is also being tested in clinical trials. The design is a randomized trial of vinorelbine vs. avelumab.

The results of this trial, if positive, could bring about an approval for avelumab in the second line setting for mesothelioma. BMS-986148 is another antibody drug conjugate that targets mesothelin and it is currently in a Phase III trial for solid tumors (there are a number of additional cancers which express mesothelin).

Vaccines are also being developed to target mesothelin. For example, CRS 207 is a vaccine that utilizes a modified version of the listeria virus to kill mesothelioma tumors. It has demonstrated activity when used in conjunction with pemetrexed and cisplatin in newly diagnosed pleural mesothelioma patients.

There are also a number of trials that modify the patient’s own immune cells (T-cells) to recognize and attack mesothelioma tumors by targeting mesothelin. In this case, a patient’s cells are collected and modified in the lab and then infused back into the patient. There have been some dramatic results reported in a number of tumors.

We hope this article is helpful to you, but we understand this information is by no means meant to be complete. If you have any questions or are considering enrolling in a clinical trial, please contact the Meso Foundation.

Our own personal cancer moonshot is underway with more drug trials than ever before and with unexpected responses being observed in a subset of the mesothelioma population.

About the Author
Mary Hesdorffer, NP, is the executive director of the Mesothelioma Applied Research Foundation. Ms. Hesdorffer is fully credentialed as a nurse practitioner and has spent nearly 20 years actively treating patients with mesothelioma.
despite the recent negative results of the large tremelimumab trial, DETERMINE, which were presented at the American Society of Clinical Oncology Annual Meeting in June 2016, many exciting novel therapies for mesothelioma are currently in development. Mimicking success in other malignancies, new drugs are being designed to target and exploit the underlying biology of mesothelioma. By capitalizing on laboratory discoveries, rational treatments are identified and tested so that advances are made more rapidly. In particular, three translational advances with upcoming clinical trials address some of the most common molecular alterations/ features in mesothelioma – BAP1, NF2, and WT1.

BAP1: BAP1 alterations in mesothelioma were first reported in 2011 by Dr. Ladanyi’s research group. Working in Dr. Ross Levine’s leukemia research lab, Dr. LaFave discovered that BAP1 mutant cancers (both leukemia and mesothelioma) are very dependent on another protein EZH2 which influences the expression of a variety of genes. In the laboratory, Dr. LaFave showed that using an EZH2 inhibitor causes cancer cell death, most pronounced in cells with altered or absent BAP1. Luckily, an EZH2 inhibitor already exists and a dose has been established. A clinical trial with this inhibitor is soon to follow.

WT1: WT1 is commonly expressed on the surface of mesothelioma cells but is not expressed on normal tissues. Because of the selective expression of WT1 on malignant cells, Dr. Scheinberg created a peptide (protein) vaccine for WT1 to trigger people’s own immune systems to selective target and destroy cells expressing WT1. After creating and optimizing the vaccine in the laboratory, a safety study was conducted. Once proven safe, a phase II study of the WT1 vaccine, now called SLS-001, was conducted in patients with pleural mesothelioma who completed multimodality treatment. Based on the encouraging results of this small clinical trial, a larger international study is planned.

These three areas of investigation are a partial snap shot of the provocative translational research taking place in mesothelioma, and they exemplify the promise of the bench to bedside process.

About the author
Marjorie G. Zauderer, MD, MS, FACP

is a medical oncologist specializing in the care of patients with lung cancer and mesothelioma at Memorial Sloan Kettering Cancer Center.

EXPANDED TRAVEL GRANTS PROGRAM
MESO FOUNDATION OFFERS FINANCIAL ASSISTANCE FOR TRAVEL EXPENSES INCURRED WHILE SEEKING TREATMENT

GRANT AWARDS

This program provides a one-time grant of up to $1,000 to cover expenses incurred by a patient (exceptions made for recurring clinical trial visits). This $1,000 grant can cover the costs of travel, lodging and meals. To receive a grant, patients are required to complete an application and document significant financial need. The grant is paid by check directly to the patient.

QUESTIONS? Contact Jill Zajac at (703) 879-3819

Colaborative mesothelioma research: designing a Renaissance

By Kanwal Raghav, MD and Anne Tsao, MD

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escerotin is an archetype of a rare cancer. Unfortunately, the rarity of the disease does not diminish the impact of this malady on the lives of the rare few that are afflicted by it. With the exception of few successes, such as the EMPHASIS trial, there has been a scarcity of adequately powered and randomized trials in this orphan cancer. Consequently, despite key advances in therapy, the prognosis for mesothelioma has not improved greatly over the past few decades and the median survival of Unreatable disease is dismal. While, there is a large unmet need to develop novel therapies in mesothelioma to improve patient outcomes, the paucity of patients at any single center will always be the foremost limitation to performing large and efficient studies. The International Rare Cancers Initiative (IRCi) established in 2011 is a testament to the realization that rare cancers need collaborative large scale efforts to enhance progress. In the United States, the cooperative groups sponsored by the National Cancer Institute (NCI) present to us a unique opportunity, already existent, for such endeavors. Their achievements in pediatric cancers are evidence enough that these collaborative approaches are valuable and can impact patient care in rare uncommon malignancies. The cooperative group collaborations extend across the United States and also internationally allowing for not only faster but also more pervasive research. The existing shared infrastructure and centralized resources of cooperative groups allows faster accrual with lower shared expenses. This is critical to mesothelioma since traditionally there has been a lack of interest and financial backing of industry in developing novel therapeutics in this disease.

We surveyed clinical trials on mesothelioma published on Pubmed and found 59 studies published in the last 10 years, 20 of which were done in the United States. Of these 40% were done through cooperative groups. Notably, cooperative group studies accrued patients at a significantly higher rate (approximately an average of 3 patients per month) than other studies (1 patient per month). Figure 1 shows the expected size of studies that can be accomplished using a cooperative group network in the United States compared to non-cooperative group studies. This analysis compellingly demonstrates that cooperative group studies are more efficient and accrue patients at a higher rate than non-cooperative group studies, making larger and more robust studies feasible.

Despite organizational, regulatory and operational challenges associated with cooperative groups, the benefit of a more widespread access to patients is expected to overcome these limitations. The ability to complete large trials rapidly can be instrumental in bringing innovative interventions to patients in a timely fashion in an effort to improve their quality of life. In conclusion, with the realization that rare cancers need collaborative large and efficient studies, the EMPHASIS trial, while only a partial snapshot of the achievements in pediatric cancers are evidence enough that these collaborative approaches are valuable and can impact patient care in rare uncommon malignancies. The cooperative group collaborations extend across the United States and also internationally allowing for not only faster but also more pervasive research. The existing shared infrastructure and centralized resources of cooperative groups allows faster accrual with lower shared expenses. This is critical to mesothelioma since traditionally there has been a lack of interest and financial backing of industry in developing novel therapeutics in this disease. 

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SUCCESS THROUGH COLLABORATION

By Kanwal Raghav, MD and Anne Tsao, MD

The present circumstances are reminiscent of a little fable from the Panchatantra. The tale begins with a trap, set by a hunter with grains spread on the ground. A flock of doves swoop down to eat the grains and are instantly trapped in the hunter’s net. As the huntsman approached, the doves flapped their wings individually in a desperate bid to escape. After several futile attempts they realize that the net was “too big” for any one of them to lift individually, but if they all, “together” few upwards synchronously, they could lift the snare and carry it far away from the hunter. It is time for us to recognize that the problem of this orphan disease is “too big” and can be overcome with a cooperative and organized research undertaking. We believe that this cultural shift is vital to the future of mesothelioma research and what’s more is that we owe this to our patients who look towards us for answers and hope.

We surveyed clinical trials on mesothelioma published on Pubmed and found 59 studies published in the last 10 years, 20 of which were done in the United States. Of these 40% were done through cooperative groups. Notably, cooperative group studies accrued patients at a significantly higher rate (approximately an average of 3 patients per month) than other studies (1 patient per month). Figure 1 shows the expected size of studies that can be accomplished using a cooperative group network in the United States compared to non-cooperative group studies. This analysis compellingly demonstrates that cooperative group studies are more efficient and accrue patients at a higher rate than non-cooperative group studies, making larger and more robust studies feasible.

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Recently, immune checkpoint inhibitors have been the focus of much discussion.

**By Kristen A. Marrone, MD**

There has been a lot of recent interest in the use of immunotherapy in the treatment of many cancer types, including mesothelioma. The use of immunotherapy is the idea of using the body’s own immune system (the system that recognizes and tries to kill ‘foreign’ insults, such as infections or cancers) to fight your cancer. Scientists continue to work to understand how the immune system cells use to tell the difference between ‘foreign’ cells and ‘self’ cells. Some of these checkpoints are like red lights, telling the immune system not to attack a specific cell. Other checkpoints are like green lights, telling the immune system to attack a specific cell. PD-1 is an immune checkpoint found on an immune cell called a T-cell, and inhibits (stops) normal T-cell function when it is turned on by another immune checkpoint protein called PD-L1 (Figure 1). PD-L1 has been found on many different kinds of cancer cells, including mesothelioma, and is thought to be one way that these cancer cells can turn off the normal immune response that would otherwise harm them. What are immune checkpoint inhibitors? Immune checkpoint inhibitors are a new class of cancer therapy drugs that work on these protein pathways to ‘switch back on’ the normal immune system response against cancer. These immune checkpoint inhibitors are antibodies against PD-1 and PD-L1, and block the usual binding of these two proteins.

By blocking this interaction, the immune system response gets turned back on by ‘taking off’ the PD-1/PD-L1 brakes. There are many immune checkpoint inhibitors being studied in clinical trials for many cancer types. These immune checkpoint inhibitors are commonly well-tolerated, with less side effects than classic chemotherapy. However, because they turn on your immune system, they can cause unique side effects related to auto-immune diseases, where your immune system can attack your normal tissue/organs. Immune checkpoint inhibitors are given intravenously every 2-4 weeks in an oncology office.

How are PD-1, PD-L1 and immune checkpoint inhibitors related to my mesothelioma? The preliminary results of a clinical trial (KEYNOTE-028) using a PD-1 immune checkpoint inhibitor, called pembrolizumab, in malignant pleural mesothelioma were recently discussed at a cancer research meeting. This study found that for previously treated patients whose mesothelioma tumor cells had PD-L1 on their surface, giving pembrolizumab resulted in a modest response rate (24%), high rate of disease control (76%) and was well tolerated. The preliminary results of another clinical trial (JAVELIN) using a PD-L1 immune checkpoint inhibitor, called avelumab, in previously treated malignant mesothelioma was presented at a different research meeting. These patients were not picked based on their mesothelioma cells expressing PD-L1. This study found a modest response rate (9.5%) and disease control rate (57%), and was again well tolerated in terms of side effects.

What are the next steps in understanding how to use this information in mesothelioma treatment? This study shows promising results for the use of immune checkpoint inhibitors in mesothelioma patients. Physicians and scientists continue to work to understand how and when to give these medications to provide maximum benefit with minimum side effects. Therefore, more work is being done to understand if these medications can be given to patients with non-metastatic disease, patients who haven’t received chemotherapy before (treatment naïve), given in combination with other agents like chemotherapy or radiation. Understanding how best to identify those patients who will be most likely to benefit from these agents, and how to monitor response to therapy is also being investigated at this time. While immune checkpoint inhibitors are currently only in use in a clinical trial setting, if results continue to be promising they may soon be considered a standard therapy for the treatment of mesothelioma.

About the author

**Kristen A. Marrone, MD**, is a medical oncology fellow at the Sidney Kimmel Comprehensive Cancer Center at the Johns Hopkins Hospital. She works under the leadership of Julie R. Brahmer, MD, associate professor of oncology and interim director of the Sidney Kimmel Comprehensive Cancer Center at the Johns Hopkins Hospital.

NEW MESOTHELIOMA TASK FORCE TAKES SHAPE

by Shakun Malik, MD

On November 9-10, 2015, the International Conference on Mesothelioma was held at the University of Hawaii Cancer Center, Honolulu, HI. The meeting was co-sponsored by the International Association for the Study of Lung Cancer (IASLC) and the agenda was designed with significant input from staff at the US National Cancer Institute (NCI) and National Institute of Environmental Health Sciences (NIEHS). The clinical session concluded with the consensus that due to the relative rarity of the disease, multidisciplinary international efforts are needed to conduct and complete randomized clinical trials with clinically meaningful endpoints. NCI is currently working on submitting a request for funding a mesothelioma trials planning meeting that has been endorsed by the NCI Thoracic Malignancy Steering Committee. The meeting is planned for March 2017. This meeting is a collaborative effort of the NCI, International Association for the Study of Lung Cancer (IASLC) and the Mesothelioma Association Research Foundation. International participation of the surgical, medical and radiation oncologists, environmentalists and pathologists who are experts in the field is expected.

Expected outcomes of the meeting will be 2-3 trials that are feasible, statistically robust and clinically meaningful in this rare disease that lacks randomized trials. Most of the available clinical information about early-stage pleural mesothelioma treatment is derived from retrospective single-center series and thus there is no consensus as to the optimal treatment. The combination of pemtrexed and platinum is the only FDA approved regimen for patients with malignant pleural mesothelioma who are either unrespectable or are not otherwise candidates for surgery.

Patient advocacy efforts supported by the Mesothelioma Applied Research Foundation (Meso Foundation) have resulted in the introduction in the US Congress of a bill to establish a mesothelioma patient registry. High-quality information from such a registry is essential in providing data to evaluate patient outcomes, quality of life and follow-up information, calculate survival rates, analyze referral patterns, allocate resources at regional or state level, report cancer incidence, and identify mesothelioma research needs.

About the author

**Dr. Shakun Malik** joined the National Cancer Institute’s (NCI) Cancer Therapy Evaluation Program in November 2013 as the head of thoracic oncology therapeutics. Her goal is to facilitate lung cancer research. Prior to joining CTEP, Dr. Malik worked at the U.S. Food and Drug Administration (FDA), where she gained valuable experience in understanding the regulatory pathways that make drugs available to patients.
Malignant mesothelioma is a tumor arising from the mesothelial cells of the pleura, peritoneum, pericardium, or tunica vaginalis. Malignant pleural mesothelioma is the most common of these, comprising of 80% of the cases. Each year over 2500 new patients are diagnosed with pleural mesothelioma. The majority of these patients present with advanced stages of disease. Patients with mesothelioma have few well-studied treatment options due in large part to the rarity of the disease. One of the most effective tools to study any disease is tumor and other body fluid samples from patients with detailed annotation of the clinical course of each patient i.e. how they were diagnosed and how well did they do on specific treatments etc.

The overall goal of the NIH Tissue Procurement and Natural History Study is to collect systematically annotated tumor and other bio-specimens from patients with all types of mesothelioma. The major goals of this study are to conduct cellular, molecular, and genetic analysis to find new ways to treat this disease as well as to identify new methods to detect it early and to monitor patients who are in treatment for response. Additional objectives are to improve our understanding of rare forms of mesothelioma (such as pericardial and tunica vaginalis mesothelioma) in terms of their natural history and effectiveness of various treatments.

The eligibility for the trial is broad and essentially any one with mesothelioma who is 2 years or older without any major illness is eligible. The trial involves a one-time visit to the mesothelioma clinic at the Center for Cancer Research, Bethesda, MD. Prior to your visit, your local oncologist will be contacted to obtain details of previous treatment, copies of your CT scans (or other imaging studies) and tumor from the previous surgery or diagnostic procedure. During the visit, an NIH medical oncologist with expertise in mesothelioma will evaluate the patient and review the clinical course. Blood, urine, and abnormal body fluids (pleural fluid or ascitic fluid) will be collected for research purposes. Usually, all the testing and consultation can be completed during the course of a day. Studies which may be performed on collected material include genetic and genomic studies, establishment of cell cultures and immunologic studies. The study opened in September 2013 and as of December 2015 had enrolled 175 patients. Preliminary findings including the development of a dedicated database to collect data for this study were presented at the International Mesothelioma Interest Group meeting in 2016.

Science For A Better Life
Bayer supports your efforts in saving cancer patients' lives through prevention and early detection.

By Anish Thomas, MD

Malignant mesothelioma is a tumor arising from the mesothelial cells of the pleura, peritoneum, pericardium, or tunica vaginalis. Malignant pleural mesothelioma is the most common of these, comprising of 80% of the cases. Each year over 2500 new patients are diagnosed with pleural mesothelioma. The majority of these patients present with advanced stages of disease. Patients with mesothelioma have few well-studied treatment options due in large part to the rarity of the disease. One of the most effective tools to study any disease is tumor and other body fluid samples from patients with detailed annotation of the clinical course of each patient i.e. how they were diagnosed and how well did they do on specific treatments etc.

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TRIALS WITH TRIALS

Emily Brown Kocis’ brave journey with peritoneal mesothelioma and clinical trials.

By Jessica Blackford-Cleeton

In July of 2014, at the age of 25, Emily Brown Kocis was enjoying motherhood in South Carolina. Eight months earlier she gave birth to her beautiful daughter, Ellie. It was in July of that year that she noticed her abdomen was swelling rapidly.

“In late July 2014, my belly became extremely swollen (what I later found out was ascites). I went to my OB-GYN thinking I was possibly pregnant again,” Mrs. Kocis remembered.

During that appointment, her OB-GYN ran some tests. A subsequent CT scan showed that Mrs. Kocis had up to four masses on or around her ovaries. She was sent to an OB-GYN oncologist for surgery. Four softball size tumors were removed from her abdomen. Mrs. Kocis also learned that cancer was in surrounding areas of her abdomen, including her diaphragm. After tumor samples were sent to MD Anderson and the Mayo Clinic, Mrs. Kocis learned she has peritoneal mesothelioma.

“At first, I was truly and honestly in denial that I had cancer,” Mrs. Kocis stated. “I was recovering from major abdominal surgery and just couldn’t believe that after that long surgery and horrible recovery that there was still cancer in my body. Plus, I had a baby to care for and moms with infants just don’t get cancer, right?”

After Mrs. Kocis’ diagnosis of peritoneal mesothelioma, she was treated locally with chemotherapy. Unfortunately, another CT scan showed the cancer in her abdomen and on her diaphragm was growing rapidly. In October of 2014, Mrs. Kocis headed to Memorial Sloan Kettering for cytoreductive surgery which included a warm water bath.

According to Mrs. Kocis, “This one was over 10 hours long. My surgeon was able to remove all the visible cancer by scraping my organs, including the diaphragm, and removing my gall bladder, uterus and ovaries, and a portion of my intestines (resulting in a temporary ileostomy).”

Two weeks after the surgery, Mrs. Kocis started receiving cisplatin and mitomycin chemotherapy through an intraperitoneal port. The cisplatin made her feel nauseous and fatigued for 7-10 days after infusion. She completed six full cycles in February 2015. Her next scan was local and she received amazing news; the surgery and subsequent chemotherapy had worked. The scan was clean. Unfortunately, the celebration was short lived.

“Heartbreak came one week later when my doctor CT images was read by my team at Memorial Sloan Kettering who DID see concerning lesions throughout my abdomen. At this point, my team advised me to seek a clinical trial.”

Mary Hesdorffer of the Mesothelioma Applied Research Foundation helped Mrs. Kocis find a clinical trial. Her first was at the University of Chicago in July, 2015. She was placed in a trial for Keytruda. Regrettably, the trial didn’t work.

In December of 2015, Mrs. Kocis went to the National Institutes of Health in Maryland for pre-trial screening and testing. She was still eligible for SS1P and pentostatin plus cyclophosphamide for mesothelioma. The schedule was intense in terms of travel and hospitalization. Every third week she was hospitalized for 7-10 days to receive the experimental drug. Mrs. Kocis did as much research as she could on the side effects of each drug.

“I was very well aware that it could cause pain and nausea/vomiting. What I didn’t realize until half way through the protocol was how extremely homesick and depressed I would be in the hospital, away from my baby. Getting poked and prodded around the clock, getting little sleep each night, with no guaranties,” Mrs. Kocis remembered.

Mrs. Kocis powered through all four cycles, though her end treatment scan showed continued growth. In her own words, she was back to “square one”.

Mrs. Kocis is now beginning another trial at the National Institute of Health entitled totopo with VX-970. Although this trial is not typically given to those with mesothelioma (it’s usually for those with small cell lung cancer), it comes with hope that it will halt tumor growth.

“The good news is that this trial, though less desirable travel/duration of time away from home-wise, is outpatient so I get to stay at the hotel with my husband and come in daily for treatment (as opposed to staying in the hospital all week),” said Mrs. Kocis.

As for now, Mrs. Kocis is dealing with the daily struggles of life with cancer.

“Some days I feel generally okay. We go about living life like no one is sick; we spend time at the beach, pool, shopping, etc. Some days I just can’t get off the couch (I’m tired, extremely nauseous, achey, etc.) and my husband or mom have to step in to fill in where I can’t,” Mrs. Kocis explained. “The most difficult thing for me right now is that I can’t provide for most of my daughter’s needs like I used to. Now I can’t believe I ever once complained about all the needs of a child. Every right I ask the Lord to let me do those tasks again. And to do them for years to come.”

As Mrs. Kocis begins her third trial, she has some words of wisdom for newly diagnosed mesothelioma patients.

“Do not stop with your local oncologist. Find an expert in the field. The best thing I did was seek a specialist who took the disease well and knew how to properly treat my disease. I’ve seen too many patients stop with their local doctors and miss the opportunity to rid their cancer by a specialist.”

Mrs. Kocis is not just a cancer patient. She is a mother, daughter, wife, and most importantly, a fighter. Her never ending quest to participate in clinical trials shows not only that she is strong, but willing to try any means necessary to beat mesothelioma.

“I hope that by participating in clinical trials, the research data collected will help future patients beat this disease quickly, even if I cannot.”

Emily Brown Kocis with her husband and daughter.

PATIENT STORY

Emily in September 2015, during a round of treatment.
Mesothelioma Awareness Day, established by Meso Foundation volunteers in 2004, has been the driving force behind the movement to bring more attention and funding to this cancer.

In the last ten years, through various activities, the Meso Foundation and its volunteers have been able to obtain “National Mesothelioma Awareness Day” proclamations by both the U. S. Senate and the House of Representatives, have raised over $1 million dollars, have received local government proclamations in their states and localities, and have generated government proclamations in their states.

Here’s how you can be involved:

- **Share**
  - Organize/attend a fundraising event. See our supporters’ events listed on curemeso.org/store.
  - As you cover the world in blue awareness, document it with photos, videos, and anything else that can be shared on social media. Then, share it with a #curemeso tag!
  - @curemeso

- **Fundraise**
  - Any blue will do, but you can also purchase blue shirts in the Meso Foundation’s store at curemeso.org/store.

- **Paint the World in Mesothelioma Awareness**
  - Facebook: facebook.com/curemeso
  - Twitter: twitter.com/curemeso @curemeso

**Intrapleural Measles Virus Therapy for Pleural Mesothelioma**

By Tobias Peikert, MD

**Mayo Clinic**

Pleural mesothelioma remains a difficult disease to treat and new therapies are urgently needed. The use of viruses to selectively infect and kill tumor cells (oncolysis) and perhaps trigger an effective anti-tumor immune response represents an interesting new treatment option. Close contact of the tumor to the pleural space (space between the outside of the lung and the inside of the chest wall) provides an opportunity to administer cancer therapies, including viruses, near the tumor for patients with pleural mesothelioma.

Within the last few years, several viruses have been and are currently being evaluated in pleural mesothelioma. These include Adenoviruses, Vaccinia Virus (GL-ONC1), Herpes Virus (HSV1716) and Measles Virus.

The interest in using the Measles virus for cancer therapy was triggered by several patients whose hematological malignancies (lymphomas) disappeared after suffering through a measles virus infection in the absence of any specific therapy for their cancer. In contrast to the natural measles infection with wild-type measles virus which represents the cell surface of various tumors, including “CD46” which is present in larger amounts on cancer cells predominantly using a receptor called CD146.

Measles viruses has an excellent safety record. Administration of attenuated vaccine strain measles virus – (HSV1716) and the herpes simplex virus – (HSV1716) have also demonstrated safety and similar disease responses to MV-NIS in patients with pleural mesothelioma.

Our study currently continues with a maximal tolerated dose expansion cohort (NCT01503177) and we are seeking to recruit an additional 20 patients with pleural mesothelioma. In addition, combination approaches such as cell carriers for the virus, intratumoral delivery of the virus, combination of the virus with immune checkpoint inhibitors and transient removal of anti-measles antibodies by plasmapheresis to address the remaining challenges of measles virus therapy in pleural mesothelioma are being explored.

MV-NIS is currently being evaluated as a cancer treatment in a number of clinical trials across various malignancies including: ovarian cancer, multiple myeloma and pleural mesothelioma. Several patients with multiple myeloma have experienced dramatic responses including one patient who accomplished a complete disease response after measles virus therapy, [http://www.mayoclinicproceedings.org/article/S0025-499X(14)00332-2/fulltext](http://www.mayoclinicproceedings.org/article/S0025-499X(14)00332-2/fulltext).

We have recently completed a first in human (Phase I) study investigating the intrapleural administration of the measles virus (MV-NIS) in patients with pleural mesothelioma. In this study MV-NIS was delivered directly into the pleural space using an intrapleural catheter. We have treated a total of 12 patients receiving 4 different doses of MV-NIS for up to 6 treatment cycles. The treatment was safe and well tolerated. The highest dose, 9 x 10⁹ viral particles (enough measles virus to vaccinate 1-10 million individuals), was found to be safe (maximal tolerated dose). In this small study we observed clinical stabilization of the disease after MV-NIS treatment in most patients and the preliminary data suggests a promising overall survival of 15 months. We also detected the emergence of new anti-tumor antibodies. Unresolved challenges include limited MV-NIS infection of and viral replication within the tumor and the boosting of mesothelioma virus antibody responses in the patients following MV-NIS therapy.

The preliminary results from other ongoing studies investigating the intrapleural administration of the vacinicia virus – GL-ONC1 (NCT01766739) and the herpes simplex virus – (HSV1716) have also demonstrated safety and similar disease responses to MV-NIS in patients with pleural mesothelioma.

**Diagnosed with Malignant Pleural Mesothelioma?**

Doctors in your area are enrolling men and women, 18 years and older, for a clinical research study. The study will evaluate the safety and effectiveness of an investigational medication for adults with malignant pleural mesothelioma (MPM).

If you have been diagnosed with MPM, you might qualify.

For more information, contact us at:

800-243-0127 or clintriage.rdg@boehringer-ingelheim.com

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DID YOU KNOW?

Charity Navigator, America’s largest and most-utilized independent evaluator of charities, has awarded the Mesothelioma Applied Research Foundation (Meso Foundation) the prestigious 4-star rating for good governance, sound fiscal management and commitment to accountability and transparency.

YOUR ADVOCACY MATTERS

Thanks to your advocacy, in July 2015, the Mary Jo Lawyer Spano Mesothelioma Patient Registry Act of 2015 was introduced in Congress. The profound impact of patient registries has been demonstrated in other diseases such as gastrointestinal stromal tumors, Glauber’s disease, newborn screening for inborn errors of metabolism, interstitial pulmonary fibrosis, muscular dystrophy and many others; which, following their implementation, have seen an acceleration in treatment development and acceleration toward cures.

Since the introduction, we have seen a huge outpouring of support from the scientific community, as well as a number of health organizations. We have also seen at least 500 of our own supporters email and call their elected officials asking them to support the bill.

WISH TO DONATE?

As you can see, individual support is critical to continuing our fight to eradicate this devastating disease. Here, every dollar has the ability to make the difference by funding ground-breaking research, patient support programs like counseling, support groups and travel grants, advocacy efforts on Capitol Hill and so much more.

Let us appreciate you thank you!

New in 2016, our Meso Foundation Giving Societies aim to appreciate our most generous and loyal donors. Your participation is a great way to fund the important work of the Meso Foundation, while enjoying exclusive benefits at each level.

CIRCLE OF HOPE SOCIETY

The Mesothelioma Applied Research Foundation’s Circle of Hope Society recognizes total individual giving from January 1 – December 31. Individual giving is defined as personal giving to the Meso Foundation, and does not include fundraising event revenue, sponsorships, grants, corporate support or other types of revenue.

Bronze $1,000 – $2,499: Benefits include recognition in annual report, invite to Symposium VIP reception.

Silver $2,500 – $4,999: Benefits include recognition in annual report, invite to Symposium VIP reception, update calls with chairs of BOD and SAB.

Gold $5,000 – $9,999: Benefits include recognition in annual report, invite to Symposium VIP reception, update calls with chairs of BOD and SAB, reduced registration fees to Foundation events.

Platinum $10,000 – $24,999: Benefits include recognition in annual report, invite to Symposium VIP reception, update calls with chairs of BOD and SAB, reduced registration fees to Foundation events, individual recognition at Symposium, personal update with Foundation’s executive director.

Diamond $25,000+: Benefits include recognition in annual report, invite to Symposium VIP reception, update calls with chairs of BOD and SAB, reduced registration fees to Foundation events, individual recognition at Symposium, personal update with Foundation’s executive director, opportunity to name/sponsor a session at a Meso Foundation special event.
UPCOMING COMMUNITY FUNDRAISING EVENTS

JULY 24  Dining with Donnie Cookbook in honor of Donald E. Smitley
This event will take place on Sunday, July 24 in Saint Marys, Pennsylvania. Contact Jennifer Gelsick at jennifer.gelsick@hotmail.com for more information.

AUG 12  13th Annual George W. Snyder Memorial Golf Outing hosted by the Insulators and Allied Workers Local #24
This event will be held on Friday, August 12 in Pasadena, Maryland. Contact Lino Cressotti at 301-725-2400 for more information.

AUG 20  Music For Meso in memory of James Dunbar “Dun” Stockwell
This event will be held on Saturday, August 20 in Baton Rouge, Louisiana. Contact Natalie Stockwell at natty877@aol.com for more information.

SEPT 10  Kayaking 4 Meso in honor of Linda Wells
This event will begin at 9:30AM on Saturday, September 10 at Halfmoon Lighthouse Park in Waterford, New York. Contact Mark Wells at markwells@kayaking4meso.org or visit www.kayaking4meso.org to learn more.

SEPT 17  Oktoberfest
This event will be held on Saturday, September 17 from 8am to 11pm in Edwardsville, Illinois. Contact Caitlin Lagemann at Gori Julian & Associates, PC; at caitlin@gorijulianlaw.com for more information.

SEPT 18  Bruce A. Waite Miles for Meso 5K
This event will be held on Sunday, September 18 at Ontario High school at 457 Shelby-Ontario Rd, Ontario, Ohio 44906. Registration opens at 1:00PM and the race starts at 2:00PM. The registration fee is $20 until September 9 and then it will be $25. For more information, visit www.brucewaite5k.com.

UPCOMING MESO FOUNDATION EVENTS

SEPT 16  International Symposium on Malignant Mesothelioma: San Francisco
This one-day conference will feature top mesothelioma experts, professionally-moderated support sessions, and a number of opportunities for socialization. Learn more and register at curemeso.org/symposium.

SEPT 17  Celebration of Life: San Francisco
This private ceremony will bring together members of the bereaved community to connect with one another and honor those who have passed on from mesothelioma. Learn more at curemeso.org/celebrationoflife.

SEPT 26  Mesothelioma Awareness Day
Established by Meso Foundation volunteers in 2004, this day has been the driving force behind the movement to bring more attention and funding to this cancer. Learn more at curemeso.org/awareness.

OCT 7  International Symposium on Malignant Mesothelioma: Chicago
This one-day conference will feature top mesothelioma experts, professionally-moderated support sessions, and a number of opportunities for socialization. Learn more and register at curemeso.org/symposium.

MARCH 27-29, 2017  2017 International Symposium on Malignant Mesothelioma
Save the date to join us for the 2017 Symposium, which will be held in collaboration with the National Cancer Institute on March 27-29th at the National Institutes of Health in Bethesda, Maryland. Learn more at curemeso.org/symposium.
The Meso Foundation gratefully acknowledges the generosity and support of our 2016 Symposium sponsors.