

 PURINA
PRO PLAN

GOLDEN RETRIEVER Update

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Shine On Project Brings Hope

OF TREATING HEMANGIOSARCOMA CANCER IN GOLDEN RETRIEVERS

A year into the Shine On Project, research of canine hemangiosarcoma is making significant progress to better understand the cancer that kills an estimated one in five Golden Retrievers.

From the collaborative spirit that successfully raised funding to support the research to the impassioned determination of hundreds of people who lost dogs to this challenging cancer, Shine On represents a game-changing approach to developing relevant canine research. The grassroots effort behind Shine On started with a donation in memory of a Golden Retriever named “Shine,” who died days before turning 9 years old and 15 months after being diagnosed with hemangiosarcoma.

Razzle Golden Retriever breeder Cathy Meddaugh of Arlington, Texas, remembers vividly the morning her retired show dog laid lethargically on the kitchen floor, droopiness drowning his usual comical, happy personality. Meddaugh hand-picked Shine (BIS CH Tempo’s G’Day Sunshine At Razzle SDHF) from a litter sired by “Harley” (CH Tempo’s Easy Rider), a Special she campaigned, and then she raised Shine from a puppy.

Having owned Golden Retrievers since 1988, Meddaugh wasn’t overly concerned about Shine’s behavior, but she felt it warranted an examination by his veterinarian at Josey Ranch Pet Hospital in Carrollton, Texas. Shine’s pale gums and lethargy prompted the veterinarian to perform an ultrasound of the dog’s heart and abdomen, which showed



BIS CH Tempo’s G’Day Sunshine At Razzle SDHF (“Shine”), pictured above, and his littermate brother, BISS GCH Tempo’s U’ve Got What Gets Me SDHF (“Player”), died of hemangiosarcoma within months of each other. The loss of her beloved dogs led owner Cathy Meddaugh to begin the Shine On Project.

pericardial effusion, or blood around the heart, stemming from a mass near the right atrium that had bled out.

“The veterinarian suspected heman-giosarcoma,” Meddaugh recalls. “This was a shock to me. I knew this cancer was prevalent in our breed, but I had never owned a dog with it.”

Arrangements were made right away for Meddaugh to take Shine to an emergency veterinary center, where the fluid was drawn out of the pericardial sac to

relieve the stress on his heart and reduce the risk of his heart stopping. By no means was Shine out of danger. The mass would likely bleed out again, possibly becoming life-threatening. He also could experience severe arrhythmia, or irregular heartbeats, that could kill him instantly.

Due to the location of Shine’s tumor, surgery was not an option. Meddaugh opted to begin a six-week course of chemotherapy, which, ultimately, she attributes to extending her beloved Golden’s life.

In comparison, most dogs live four to six months when treated with standard-of-care surgery and chemotherapy.¹

Grief-stricken over losing Shine, Meddaugh only months earlier had lost another Golden Retriever to hemangiosarcoma. “Player” (BISS GCH Tempo’s U’ve Got What Gets Me SDHF), Shine’s littermate brother from an earlier breeding of the sire and dam, died just after turning 9 years old.

A Promise to ‘Shine On’

Struggling to cope with the loss of her dogs, Meddaugh wanted to do something that would make a difference. Offering a donation of \$100,000 with a matching challenge to the Golden Retriever community to jump start research of hemangiosarcoma, she went to the Golden Retriever Foundation (GRF) seeking ideas on how to make her dream happen.

Rhonda Hovan, research facilitator for the Golden Retriever Club of America (GRCA), was familiar with the hemangiosarcoma research of Jaime F. Modiano, VMD, PhD, the Perlman Endowed Chair in animal oncology at the University of Minnesota. She knew that Dr. Modiano and his research team had developed a blood test that was being used to detect the cancer in dogs and that the research was ongoing with the discovery of a promising chemopreventive toxin to treat the cancer. She also knew that Boxers and Portuguese Water Dogs are highly affected by hemangiosarcoma.

Behind-the-scenes connections with the American Boxer Club Charitable Foundation and the Portuguese Water Dog Foundation led to a three-way funding team. The Golden Retriever Foundation brainstormed the Shine On Challenge, encouraging monetary gifts to match Meddaugh’s donation and targeting 2016 as the start of the research funding.

Collette Jaynes, president of GRF, planned the announcement of the Shine On Challenge and the collaboration for the Top 20 gala at the 2015 GRCA National Specialty. A spotlight shone as one dog of each breed, first a Golden, next a Boxer, and then a Portuguese Water Dog, entered the ballroom. An emotional outpouring



began as Golden enthusiasts got behind the effort, holding silent and live auctions and selling T-shirts and flashlights stamped with Shine On.

“Cathy (Meddaugh) was the driving force behind this, and Rhonda (Hovan) knew about the work of Dr. Modiano. It was a perfect match,” Jaynes says. “We are honored to partner with the American Boxer and Portuguese Water Dog foundations to magnify the effectiveness of all our donors’ contributions.”

“This novel approach to a particularly aggressive form of cancer in dogs has the potential to eventually change the landscape and improve outcomes for all dogs diagnosed with this horrible disease,” says Diane E. Brown, DVM, PhD, DACVP, CEO of the AKC (American Kennel Club) [Canine Health Foundation](#), which is administering and managing the grant. “This unprecedented collaboration among these three breed club foundations and their dedication to canine health has driven this project forward and is helping to make a significant difference for all dogs.”

Thus, in March 2016, Dr. Modiano and his team began Phase 1 of a three-year study supported by funding of \$432,000. The focus is on refining the early detection blood test to identify hemangiosarcoma

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When a Dog Has Hemangiosarcoma

A silent disease, hemangiosarcoma develops painlessly. Recurring lethargy and pale mucous membranes due to anemia are the only hints that a dog may have the cancer. Most dogs have an advanced form of the cancer when it is discovered, explaining why severe internal bleeding and sudden death are not unusual.

The cancer occurs most commonly in dogs older than 6 years of age. It usually originates from a cell in the bone marrow that settles in the thin layer of cells that line the interior of blood vessels. Tumor cells, thus, have access to the blood supply, allowing them to potentially metastasize to virtually any organ in the body.

The disorganized growth of tumor cells in the walls lining the blood vessels disrupts normal blood flow, leading to blood clots and hemorrhaging. Mini-hemorrhages can heal quickly with dogs showing only mild signs, but severe hemorrhaging from within a tumor can be fatal.

Sadly, most dogs die before treatment can begin. Without treatment, dogs may die in one to two weeks, and with treatment, the expected survival is four to six months. Tumors in about 50 percent of cases start in the spleen. Other internal organs commonly affected include the heart, liver, lungs, kidneys, mouth, muscle, bone, brain, and bladder. Tumors that occur in or under the skin typically are less aggressive.

The standard of care is surgical removal of the primary tumor, depending on the tumor location, and/or



chemotherapy. Treatment is meant to prevent fatal blood loss and to extend life but is seldom curative. Chemotherapy delays the recurrence of metastasis, which occurs in virtually every dog diagnosed with the cancer.

cells and evaluating the effectiveness of the chemopreventive treatment to attack hemangiosarcoma stem cells and kill them before they have a chance to form a tumor.

“Our goal is to better understand how the blood test can be used to detect this cancer in dogs and to confirm the use of the test to predict cancer progression in treated dogs,” says Dr. Modiano. “Few cancers are more deadly. The frequency of this cancer underscores the need for developing specific treatments in dogs and opens the door to help improve our understanding of sarcoma tumors that occur infrequently in humans.”

A Targeted Three-Phase Approach

In the first year of Shine On, progress has been made on Phases 1 and 2, and Phase 3 will begin later this year. The process involves these steps:

- **Phase 1:** Defines the parameters for using the blood test to confirm the presence of hemangiosarcoma cells to help distinguish dogs that have the cancer from those that do not.
- **Phase 2:** Determines whether the blood testing for hemangiosarcoma cells will help predict when tumors become resistant to treatment and thus when a dog in remission might relapse. Seeks insights that will allow

therapy management to extend remission and prevent unexpected life-threatening bleeding episodes.

- **Phase 3:** Establishes the performance of the blood test in early detection and the use of eBAT, the chemopreventive, to eliminate hemangiosarcoma cells before tumors have a chance to form.

“We spent the first six months investigating how to refine the blood test so that hemangiosarcoma cells could be detected not only in dogs with tumors but also in dogs that have not yet developed tumors,” Dr. Modiano says. “It was a major challenge. We identified several molecules that we believe will improve the sensitivity and specificity of the test for early detection of cancer.”

In the next six months, the team made progress toward Phases 1 and 2. Blood samples were screened from 54 dogs. There were 31 dogs that were unaffected and 23 dogs that either had hemangiosarcoma, or another type of cancer, or a spleen mass due to a condition other than cancer.

“We defined the smallest number of hemangiosarcoma cells the test could detect in a routine blood sample and confirmed that hemangiosarcoma cells are not detectable in the blood of otherwise healthy dogs at low risk for the disease,” says Dr. Modiano. “We also found from samples tested of dogs undergoing treatment that the blood test is an indicator of when treatment may not work well.”

Getting ready for Phase 3, they established the safety of eBAT and documented its ability to eliminate cells responsible for initiating and maintaining hemangiosarcoma. “The remarkable safety record of eBAT combined with its potential to directly kill cells that form hemangiosarcoma tumors and its ability to modify the cellular environment so it becomes inhospitable for tumor growth make it a highly desirable drug for hemangiosarcoma prevention,” Dr. Modiano says.

Prior to Shine On, a breakthrough came with the discovery of eBAT, a genetically engineered lethal bacterial toxin. Linking the toxin to two receptors, epidermal

growth factor receptor (EGFR) and urokinase plasminogen activator receptor (uPAR), which are rarely present at the same time in normal cells but almost always occur together in hemangiosarcoma cells, allowed for a highly targeted delivery system.

Importantly, eBAT was proven to kill highly chemotherapy-resistant sarcoma cells.

The results of the eBAT research, recently published in the journal *Molecular Cancer Therapeutics*, showed that the therapy is safe and potentially effective at biologically active doses. The findings support the belief that the bispecificity of eBAT reduces overall toxicity risks normally associated with EGFR targeting.

As Shine On continues, the research team plans to continue enrolling dogs in Phases 1 and 2, with Phase 3 enrollment starting soon. “I expect Phase 3 to begin this fall,” Dr. Modiano says. “Golden Retrievers, Boxers and Portuguese Water Dogs that are at least 6 years old with no evidence of disease are eligible to participate in Phase 3.”

Reflecting, Dr. Modiano says, “Our goal is to reduce the health burden of this cancer in dogs and humans. A method to detect hemangiosarcoma in its earliest stages and an effective mechanism for prevention would be a giant leap forward in the management of this disease.”

Meddaugh is pleased with the tremendous support from the Golden Retriever community including breeders and owners to help fund the cancer research. “It’s been amazing,” she says. “We’re all affected.” ■

¹ Wendelburg KM, Price LL, Burgess KE, et al. Survival Time of Dogs with Splenic Hemangiosarcoma Treated by Splenectomy with or without Adjuvant Chemotherapy: 208 Cases (2001-2012). *J Am Vet Med Assoc.* 2015;247(4):3930403.

Purina appreciates the support of the Golden Retriever Club of America and particularly Rhonda Hovan, the GRCA research facilitator, in helping to identify topics for the *Purina Pro Plan Golden Retriever Update* newsletter.

How You Can Participate in Shine On

The Shine On Project that is underway at the University of Minnesota College of Veterinary Medicine continues to enroll dogs for Phases 1 and 2 of the hemangiosarcoma study. Phase 3 enrollment, which will begin this fall, will include Golden Retrievers, Boxers and Portuguese Water Dogs that are at least 6 years old with no evidence of cancer. For information, please contact Amber Winter, study technician, at alwinter@umn.edu or 612-624-1352. You also may visit this [website](#) for information on eligibility and rules for participation.

Purina Pro Plan Incorporates NATURAL Formulas Into Existing Platforms

Purina Pro Plan is integrating existing NATURAL formulas, as well as adding new formulas, to the already strong FOCUS, SPORT and SAVOR platforms. Containing no artificial colors, flavors or preservatives and no poultry byproduct meal, the formulas are made without corn, wheat or soy, and include grain-free options. Additionally, two new formulas made without corn, wheat, soy, artificial colors or flavors, or poultry byproduct meal will be added to the BRIGHT MIND platform. Look for the formulas this summer.

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Handlers stack Standard Poodles during judging at the Poodle Club of America National Specialty in April at the Purina Event Center in Gray Summit, Missouri.

Purina Event Center Adds Amenities

Record-setting entries at the Poodle Club of America National Specialty, held in April at the Purina Event Center in Gray Summit, Missouri, helped confirm to club officials that holding the event in the Midwest after many years in the East was a good move. Recent upgrades to the classy dog show venue include improved cellphone reception, expanded Internet service to support live streaming, and an enhanced Wi-Fi connection with increased bandwidth that allows for easy photo and video sharing on social media. Video monitors throughout the facility allow exhibitors to watch the action in the show rings in real time. Located about an hour from St. Louis, the Purina Event Center, which was custom built to support the dog fancy, opened in 2010.

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Upcoming Events

Check out upcoming Purina-sponsored show and sporting events at venues across the country. These events are great opportunities to meet dog enthusiasts, canine experts and Purina representatives who can answer questions about *Purina Pro Plan* dog food and *Purina Pro Club*.

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