SELECTED WORK

Michael Clarke

Creative Direction

Art Direction

Design Strategy

Design Fulfillment and Production

THE IMMUNO MAN

By Scott Merville

Wyatt McSpadden

A blues-loving scientist from a small town in South Texas shook off the immunotherapy naysayers and made believers out of everyone

Back in 1977, James Allison arrived at MD Anderson's Science Park in Smithville, Texas, with an itch to discover something new. It was the music-loving, harmonica-playing scientist's first faculty position, and he was happy to be near Austin, his favorite city.

There was no way of knowing then, but Allison's initial research on the immune system at MD Anderson laid the groundwork for his return in 2012 as the father of immune checkpoint blockade — an entirely new way of treating cancer that's yielding unprecedented results.

Thanks to his clinical collaborators, he's been fortunate enough to meet some of those saved by his drug, ipilimumab (Yervoy®), the first ever to improve survival for patients with advanced melanoma. According to American Cancer Society predictions, the disease will kill more than 9,700 people in the U.S. in 2014.

One of the most dramatic stories belongs to an original phase I clinical trial patient in Los Angeles.

"'The patient just wanted to live long enough to see her teenage sons graduate from high school," says Allison, chair of Immunology. "'That was 14 years ago. She's lived to see them go to college, go to graduate school, start their own families and get established in their careers …" His voice trails off and his eyes mist. "I get emotional talking about them. That's what it's all about."

James Allison, Ph.D., loves to sing the blues. The scientist and harmonica player formed a blues band with other immunotherapy experts called The Checkpoints, which has a standing gig at the House of Blues in Chicago during the annual meeting of the American Society of Clinical Oncology each summer.

All Over THE MAP

By Ron Gilmore

Azerbaijan.
Wyoming.
Winkler County, Texas.
These places seem to have little, if anything, in common.

But they're among the local, national and international locations that MD Anderson patients call home.

Last year, patients traveled from more than 100 countries, 228 Texas counties, 49 states, Washington, D.C., and the U.S. Virgin Islands for the very best in cancer care. Whether it's Muleshoe, Memphis, North or South Korea, the institution's patients seek out the expertise of America's No. 1-ranked cancer center.

Just ask Eileen Sullivan, who's been coming to MD Anderson for four years. Originally diagnosed with chronic myeloid leukemia in her hometown, the 91-year-old Huntsville, Alabama, native was referred to MD Anderson in 2011 when her cancer progressed.

Houston and the often overwhelming city within a city that is the Texas Medical Center were an immediate challenge for Sullivan and her caretaker, Amy Shadoin, who is also her daughter.

"We contacted Patient Travel Services and they made everything seamless," says Shadoin. "It was such a blessing because there are so many moving parts at MD Anderson."

Shadoin marvels at how her patient travel representative, William Perla, immediately recognizes her voice over the phone.

"He doesn't even have to ask who it is," she says. "He knows my voice. I've also heard his co-workers ask how people's grandbabies are doing. They're that familiar with their patients."

That level of familiarity was a comfort to Sullivan during the past three years when she was enrolled in a clinical trial. With that completed, she now returns every three months for regular follow-ups.

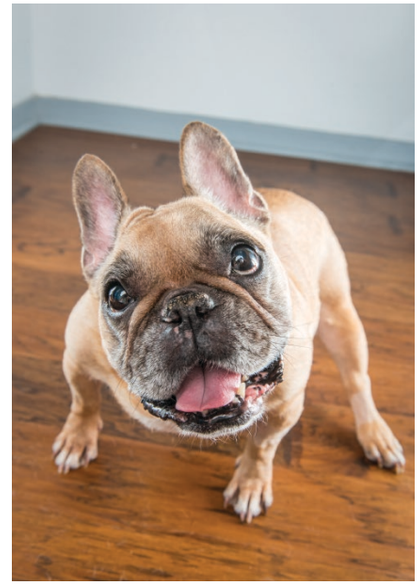
HELPING TO NAVIGATE

Patient Travel Services is just one of the offices available to help patients during a stressful transition. Gwen Hurst, a program manager in Finance, Accounts Payable and Travel, understands how scary things can be for patients when their chief concern is their health, not how they'll get to Houston or where they'll stay.

"We have two full-time travel agents who help patients find lodging, offer recommendations for things to do, work with airlines to waive fare-change fees for patients whose schedules are unpredictable, and provide other services," Hurst says. "We help patients better understand the scope of just how big MD Anderson is. And, in general, we're just there for them throughout their visits."

Other offices, such as the International Center and Social Work, also provide assistance to patients traveling to Houston for care.

MD Anderson is a four-hour drive from Robert McAlister's ranch in Hico, Texas.
Wyatt McSpadden



A dogged pursuit of aggressive brain cancer

Dogs are helping researchers better understand the biology of brain tumors in hopes of developing better treatments for high-grade gliomas

By Meagan Raeke
Photos by Wyatt McSpadden

You probably wouldn't guess that Sadie Watson has much in common with anyone at MD Anderson. After all, Sadie is a 9-year-old French bulldog and beloved family pet.

But she's also facing the same diagnosis as many patients in the Brain and Spine Center: a brain tumor called a glioma.

It turns out that the same brain tumors that affect humans are found in dogs. Now, physician-scientists from MD Anderson and Texas A&M University are teaming up to help man and man's best friend.

A common bond

Current therapies simply aren't very effective at treating extremely aggressive gliomas, such as grade IV glioblastoma, which spread quickly throughout the brain. And the survival rate is poor in both humans and dogs.

"We have the same struggles in that these gliomas in dogs are really hard to treat," says Jonathan Levine, D.V.M., professor and department head of Small Animal Clinical Sciences at Texas A&M College of Veterinary Medicine & Biomedical Sciences, where Sadie is a patient.

But scientists know tumors from both species look almost identical on MRI scans and under the microscope. And based on this, the National Cancer Institute (NCI) created a comparative brain tumor consortium in 2015 to evaluate canine brain cancer as a model for human disease.

"The big question is: Are human and canine high-grade gliomas genetically the same?" says Amy Heimberger, M.D., professor of Neurosurgery at MD Anderson and co-leader of the Glioblastoma Moon Shot™.

To find the answer, she's leading a multi-institutional NCI-funded study to characterize genetic alterations in canine glioma and identify immune responses in these tumors. Heimberger is also a dog lover, with a collie named Duke, a West Highland terrier named Winston and a long-haired dachshund named Millie.

Levine and brain tumor genomics expert Roeland Verhaak, Ph.D., professor and associate director of Computational Biology at The Jackson Laboratory in Connecticut, are co-investigators in the first-of-its-kind study. Levine has two dogs: Ramsey, a bloodhound; and Lucy, a border terrier. Verhaak has a Chihuahua named Lola.

Verhaak is currently analyzing data taken from whole-genome and RNA sequencing of 90 tissue samples from dogs with brain tumors. The long-term goal is to develop a safe and effective immunotherapy for both dogs and people with high-grade gliomas.

"These dogs, not only do they stand to benefit, but they represent an amazing opportunity to understand the biology of brain tumors, to understand how tumors evade drugs and to understand the immune response," Levine says.

COURAGE UNDER FIRE

By Ron Gilmore

Thanks to teamwork and quick thinking, valuable cancer research was saved when wildfires threatened the Smithville campus last October

There was nothing "hidden" about the Hidden Pines wildfire that charred nearly 540 acres of MD Anderson's Smithville research campus in October 2015.

The fire, first reported mid-day on Oct. 13, quickly became an inferno that threatened the very existence of the Virginia Harris Cockrell Cancer Research Center, Science Park, home to MD Anderson's Epigenetics & Molecular Carcinogenesis department.

Were it not for the quick thinking and dedication of facility staff, thoughtful plans put into place after another wildfire in 2011, the rapid response of area fire departments and authorities, and long-standing ties to the Smithville and Bastrop County communities, it might have been a devastating event setting vital research back years.

Despite a fire that burned nearly 75% of the campus property, no facilities — including highly-specialized laboratories, research animal areas and administrative and academic offices — were touched.

Sharon Dent, Ph.D., chair of Epigenetics & Molecular Carcinogenesis and director of Science Park, credits many people within the campus and in the community for this outcome. But it's the devotion people have for the campus that, perhaps, mattered most.

"It was nothing short of an amazing effort by everyone involved," says Dent. "Everyone stepped up and asked 'What can I do?'"

The Hidden Pines fire wasn't Dent's first time facing a threat to the campus, perched atop a hill in verdant loblolly pine woodlands near Smithville, a town of 4,000 people located in the bluebonnet- blanketed Texas Hill Country. Dent experienced the devastating Bastrop County Complex fire that destroyed more than 34,068 acres and 1,643 homes in 2011, but spared the campus. This was a learning experience that, combined with the collective knowledge gained from other campus personnel during previous fire events, prompted Dent and her team to make sure they would be prepared in the future.

Those preparations paid off during the Hidden Pines fire that burned 4,600 acres, 64 homes and other structures before being extinguished by firefighters in a concerted effort between city, county and state.

As home to MD Anderson's largest basic science department, Science Park has been a center for investigative discovery since the Texas Legislature set aside 717 acres for a cancer research facility in the 1970s. Today the campus includes 14 structures including nearly 101,500 square feet of research space, in addition to a 27,600 square foot animal facility and an administrative support building with a conference center. It employs about 250 people, and is recognized for its work in unlocking the mysteries of cancer's molecular biology and developing new approaches for cancer prevention and detection. Francesca Cole, Ph.D., assistant professor of Epigenetics & and Molecular Carcinogenesis, is one scientist who was concerned about her life's work.

"We had a lot of timed mice experiments that were in jeopardy," says Cole, who studies how damaged DNA is repaired and implications for potential new therapeutic targets. "We had mice that were three years into the breeding process and to lose them could have really set our research back."

The fire "made a bee line" for Lab 4, a large research facility that houses her laboratory. Although the fire did not damage the lab, it was shut down for two weeks due to smoke and cleanup from the fire- fighting effort. Cole credits Dent for the advance preparation that saved labs, protected animals and kept staff safe.

A decade after Red and Charline McCombs gave $30 million to MD Anderson, the funds are fueling groundbreaking advances in cancer research

Adolfo Chavez III

The gift that's giving life to discoveries

By Miriam Spradling

Ten years ago, San Antonio businessman Red McCombs and his wife, Charline, made a transformative, unsolicited $30 million gift to establish the Red and Charline McCombs Institute for the Early Detection and Treatment of Cancer at MD Anderson. The donation was the largest the institution had received to fund research at the time, and led to the most aggressive expansion of cancer research in its history.

The 87-year-old McCombs says his desire to give comes from examples set by his parents.

"My father made 25 bucks a week, which he'd give to my mom so she could put $2.50 aside for the church," he says. "And although we didn't have any extra space, and certainly no extra money, Mom would take in children and keep them while their families worked out their problems."

McCombs first encountered MD Anderson as a college student while visiting a patient. He was impressed by what he saw, and the experience stuck with him. Years later, he reached out to then-President Charles LeMaistre (1978-1996) to offer some praise.

"I called Mickey LeMaistre and complimented him on the care I saw being offered to everyone there," he says. "Mickey explained how everyone they see is troubled, either because they're a patient or because a loved one is a patient, so they take extra care not to add to that. I told him it was the best program I'd ever seen."

Through the years, McCombs's relationship with MD Anderson continued to develop. He joined the MD Anderson Cancer Center Board of Visitors (BOV) in 1986, led the Institutional Initiatives Committee (1993-1994) and chaired the BOV (1995-1997). His daughter, Marsha Shields, joined the BOV in 2009.

"I have a soft place in my heart for MD Anderson because they're the best in the world at what they do," he says.

The rise of melanoma in kids

As awareness of the pediatric cancer grows, so do efforts to teach valuable lifelong prevention habits at a young age

By Julie Penne
Wyatt McSpadden

When 14-year-old Kai Dunbar bursts out of the starting blocks while training with her high school track team, she has a single focus: crossing the finish line first.

It was that same philosophy of pushing on to the finish that brought Kai through a rare diagnosis of malignant melanoma, news that she and her family received when she was only 9 years old.

Born with a mole on her right cheek, Kai says the mark grew and eventually spread behind her ear. When it started bleeding and itching, her mother knew the changes were unusual and took her daughter to a dermatologist. After a biopsy and initial diagnosis, the dermatologist recommended the Dunbars go to MD Anderson Children's Cancer Hospital for specialized care.

In the five years since, Kai has had three surgeries and several rounds of the immunotherapy drug interferon, which uses an antiviral protein produced by the body. She experienced a number of difficult side effects and was away from school for a full year. Now an incoming sophomore at Manvel High School, a half-hour's drive south of Houston, Kai comes back to the children's hospital outpatient clinic once a year for checkups, scans and labs.

Kai's experience with the most deadly form of skin cancer has given her a new role among her growing social circle. In addition to hanging out with her friends, going to movies, performing hip-hop dance and running track, Kai is an advocate for sun protection and a walking example of why prevention and awareness are so vital.

"I try not to think about my cancer experience too much, but I always tell my friends to wear their sunscreen, be aware of any unusual moles, warts or freckles on their skin, and stay in the shade whenever possible," she says. "When I tell them what happened to me, they're shocked. They've never met anyone their age who's been diagnosed with or survived cancer, let alone a cancer that is so much more common in adults."

A rare diagnosis comprising about 3% of all childhood cancers, pediatric melanoma is on the rise in the United States. According to the American Academy of Dermatology, the number of cases diagnosed in the U.S. each year has doubled since 1973, from less than 250 cases to about 500 today.

"We live in a culture that loves tanning. Let's help our kids navigate the pressures of tanning and arm them with answers when they encounter others who question their sun safety habits."

— Dennis Hughes, M.D., Ph.D.

But even as the number of diagnoses increases, the American Cancer Society reports that treatment may be delayed in up to 40% of cases, often due to a low level of awareness that the disease can affect children.

Coil shooting in Angola

View from the *WG Amundsen*

The *WG Amundsen* has experience as a wild card in WesternGeco, able to move from one hemisphere to the next and back again in short order. Combined with a record of rapid deployment, this ability was to serve her well for the Angola Coil Shooting* assignment.

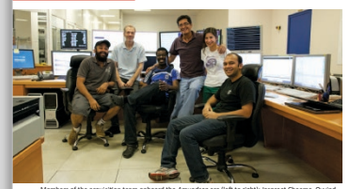
Senior Acquisition Specialist Oyvind Thorsen, part of the work boat team, heads back to the *WG Amundsen* after finishing a work boat sortie.

After beginning the year in Equatorial Guinea, the *WG Amundsen* worked her way down the coast of West Africa, where she completed a survey over the wonderfully named prospect Mcbo Bikendo before moving on to Angola to conduct a Coil survey in Block 33 for the same client, Total. This was one of the highest profile jobs of recent times – a combined, overlaid Coil and Narrow Azimuth acquisition, or "a survey within a survey".

Angola Block 33 is an ultra deepwater block. In early 2010 Total issued an invitation to tender for a long offset Narrow Azimuth (NAZ) survey of 1,300 km² with an additional option to acquire a Coil survey. Various Coil survey designs and sizes were considered, and a survey footprint of 688 km² was selected.

The objective of both the long offset Narrow Azimuth and the Coil survey was to improve the subsurface imaging over and around the Calulu field with the smaller Coil survey sited above a particularly difficult imaging challenge, a salt overhang.

The Coil survey comprised 11 columns of circles, alternating between six and seven circles per column with the circumference of each circle being 40 km. Each column of circles was acquired as a single continuous unit of data, which meant that the *Amundsen* would shoot continuously for 36 hours before "line" changing to acquire the next column of circles.



Members of the acquisition team onboard the *Amundsen* are (left to right): Jaspreet Cheema, Oyvind Thorsen, Adesegun Adeoye, Hector Melendez Martinez, Ayca Eleman, and Shashank Rai Goel.

The main challenge for the vessel crew was the lack of a set maintenance schedule during a Coil job. This is a familiar situation to all the gun crews who have run Coil surveys across the fleet.

On a typical Narrow Azimuth survey, after 3-6 hours of acquisition the crew has a line turn of about 3 hours to complete gun maintenance. However, on a Coil survey, there is a 3-hour line turn only every 36 hours.

Furthermore, as the vessel would be acquiring both the NAZ and Coil surveys semi-simultaneously, the forces and therefore dynamics of the in-sea equipment would change continually. For example, the front end of the 10-cable spread and the gun separations would change, depending on whether a straight line (NAZ) or circular line (Coil) was being acquired. Achieving the right balance with monowing angles and hard link distances across the front ends would be critical; for extra stability we also cross-tagged all the way across the spread.

(Monowings are about 7m high and are akin to an aircraft wing. A number of them are attached at the front of the 10-cable spread where they "fly" beneath the surface with a vertical orientation, and keep the cables at the required separation.)

Once deployment began, the *WG Amundsen* had gear in the water, including six monowings, in less than 58 hours. On February 11, the surveys got underway. We shot a line from the Narrow Azimuth survey first, and then we shot a number of columns of Coil. One of the main challenges in a Coil survey is cross-flow noise, which is the noise generated by the vibration of the cable when it is forced through a cross-current. After acquiring the first two columns of Coil data, the vessel switched back to the NAZ survey while the Coil cross-flow noise could be analyzed and the appropriate noise attenuation strategy agreed with Total.

After three days of acquiring the NAZ data, the vessel returned to the Coil survey and continued the Coil acquisition until the survey was complete. At several times on the Coil survey, we recorded over 200 km shot in one day. Prime production time (the time actually acquiring data) for the Coil survey was an unprecedented 83% of the total Coil survey time, with line-change time a miniscule 7%. Absolutely no infill was necessary and acquisition was so efficient that we completed the survey well ahead of schedule.

Senior Acquisition Engineer Adesegun Adeoye during streamer deployment on the back deck

Senior Acquisition Specialist Kimi Kuniyoshi during back deck operation

Once the Coil survey was complete, the *Amundsen* switched back to the NAZ survey for the final time to complete the acquisition of this survey. As the survey progressed we encountered a significant amount of fishing gear, primarily small rafts with GPS buoys and nets. On one occasion, a raft was caught at the front of an outer streamer. Removal of the raft necessitated a carefully planned dual workboat operation: the first boat went ahead of the raft and picked up the streamer, allowing the second boat to come in behind, clamp on, and drop back to deal with the raft.

Workboat crews were also busy dealing with barnacle growth and streamer maintenance. Q-Fins sometimes started spinning on the NAZ survey, usually due to external factors such as unpredictably strong currents or marine life, and required an operator's full attention to avoid excessive twists in the cable.

On Sunday March 27, our support vessel Mainport Ask cleared in to Luanda to bring on the first wave of crew 2. A mixed crew shot the last few infill lines on the NAZ survey and one reshoot of a small portion of one circle for the Coil. Both surveys were now complete; the NAZ survey was also acquired ahead of schedule.

Zero incidents were reported for this significant Angola "survey within a survey". Total awarded *WG Amundsen* and support vessels a generous gift toward our welfare fund for meeting their HSE objectives. The WesternGeco team was proud to be part of this exceptional project.

By Richard Day, Positioning Specialist David Hill, EAF Geophysics Manager Karl Read, Chief Field Geophysicist

Photos by Richard Day

New Zealand

PROSPECTING IN THE NEW FRONTIER

New Zealand is one of the world's most isolated regions with a land mass only slightly larger than the UK and a population of just 4.4 million. Its pristine environment makes it an attractive place to visit, with its indigenous culture playing an important role in the identity of all who reside there.

Historically, New Zealand's vast natural resource potential has been difficult to exploit. It has the fourth largest exclusive economic zone (EEZ) in the world – roughly 15 times its land mass, and a stable fiscal regime; however, it must compete in a global marketplace where proximity to export markets is a key driver. This, coupled with the fact that New Zealand is a particularly challenging exploration environment, has made it difficult to justify the vast initial investment required in exploration and infrastructure to produce discoveries.

Petroleum was first discovered in New Zealand after naturally occurring oil seeps were identified in Taranaki with the first well dating back to 1865. To date Taranaki is the only producing basin in New Zealand and contributes over $2.1B to GDP annually, with petroleum being the fourth largest export after dairy, meat and forestry. Recent advances in drilling and mobile production facilities have opened up opportunities in more remote basins previously thought to be subcommercial, and exploration is currently underway all over the country.

By Tristan Allen, APS Multiclient Sales Manager

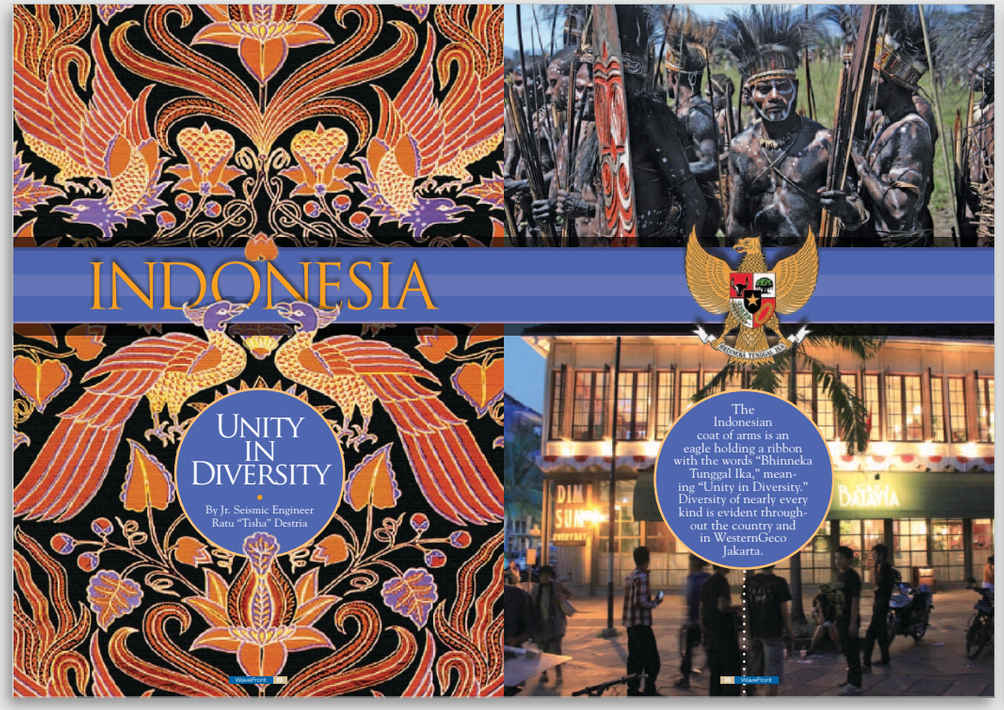
INCREDIBLE INDIA

The Myth and The Mystery

By Sarah Jefferies, former IMM Asst. Personnel Manager

Close your eyes for a moment and think.

What do you picture when you imagine India? Do you see vibrant saris, intricate religious carvings, or buzzing street bazaars filled with vendors, beggars, and shoppers? Perhaps the rich smells of hot spices wafting from street-side food stands, the acrid blend of saccharine incense and congested humidity, or fresh and rejuvenating Himalayan air? Can you hear the sounds of nature in the jungle, the intrusion of car horns and engines in the city, or waves from the Arabian Sea gently lapping at your feet? Whatever your image of India, it surely must stimulate an exciting and overwhelming sensory overload.


INDONESIA
UNITY IN DIVERSITY
By Jr. Seismic Engineer Ratu "Tisha" Destria
The Indonesian coat of arms is an eagle holding a ribbon with the words "Bhinneka Tunggal Ika," meaning "Unity in Diversity." Diversity of nearly every kind is evident throughout the country and in WesternGeco Jakarta.


THE SETTING
The geographic features of Indonesia are dominated by volcanoes that were formed because of seduction zones between the Eurasian plate, Pacific plate and the Indo-Australian plate.
Stratovolcano mountain of Bromo, 2395 meters (7855 feet) above sea level, Central Java, West Indonesia
INDONESIA: UNITY IN DIVERSITY
Some of these volcanoes are very famous in the study of geology – Krakatau, for its eruption in 1883; Mount Tambora, for the most violent eruption in 1815; and Lake Toba for its super-volcanic eruption estimated to have occurred 74,000 years ago, causing six years of volcanic winter and many smaller eruptions across the country during the 1900s.
This history of violent volcanic eruptions has left Indonesia with a magnificent legacy of natural hot springs, mountains, jungles, rivers, and beautiful sites for diving. From breathtaking coral reefs to white or even black sand beaches; from waterfalls to a "milk pond" of natural hot springs and three different-colored lakes between mountains — although the landscape may be dominated by volcanoes, the geography in Indonesia is vastly varied.
The weather in Indonesia is a steady 68-90 degrees Fahrenheit (20-33 degrees Celsius) every day of every year. Indonesia has two seasons each year: dry and rainy. This climate has encouraged the evolutionary formation of new biological species and a huge variety of species as well.
For example, Indonesia is home to the largest flower on earth: the Rafflesia, with a diameter of one meter at full growth. Indonesia also boasts 6000 species of orchids, the world's largest living ancient lizard (the Komodo Dragon) at up to three meters long and 90 kilograms, the only two surviving species of orangutang (or orang utan, meaning "forest people" in Indonesian), and the Sumatran Tiger, one of the rarest tiger species on Earth. Also found here are the Tarsier Pygmy, a 10-centimeter "monkey-look-alike" that lives in trees, found mainly on Sulawesi (Celebes Island), along with the world's largest bats, with wing spans of more than six feet. The tropical rain forests are mainly on Kalimantan (Borneo) and Sumatra Island, both quite far from Jakarta (one-hour flight). In addition to tropical rain forests, Indonesia is home to the largest Mangrove forest in the world.
Weathering leaves and stems form a fertile soil for cultivation, while volcanic soil is full of minerals that can neutralize the acidity in the ground. So, throughout the islands, nearly every Indonesian enjoys an abundant supply of mango, rambutan (similar to lychee fruit) and guava trees. Nearly anything thrown on the ground will grow, making Indonesia a perfect zone for massive crop businesses.
HISTORY, POLITICS AND RELIGION
Europeans first came to Indonesia in 1512 when Portuguese traders sought to monopolize the sources of nutmeg, cloves, and cubeb pepper in Maluku, commonly known as the Spice Islands. Dutch and British traders followed. In 1602, the Dutch established the Dutch East India Company (VOC) and became the dominant European power. Following bankruptcy in 1800, the VOC was formally dissolved and the government of the Netherlands established the Dutch East Indies as a nationalized colony.
After 350 years of colonization, the Dutch left our ancestors with a fantasy world: a very rich country and modern amenities. The Japanese invasion and occupation during World War II
Candi Prambanan, a Hindu temple in Jogjakarta (or Yogyakarta), central Java


Cleaner and Greener
The Gorgon CO_2 Seismic Survey on Barrow Island, Australia
Environmental Mastery in a "Class A" Nature Reserve
When you think of an island off the coast of Australia, what images come to mind?
You may think of lush, green grass, pristine beaches and shady trees to protect you from the harsh tropical sun. Sounds like the perfect job location, right?
Well, Barrow Island took many of us on Crew 1160 by surprise. Although it did have the most breathtaking beaches and unbelievable sunrises, 90 percent of the island is covered by spinifex, which is a spiny, prickly grass known as one of the world's hardiest. Just as well, because it is adapted to grow in harsh and arid climates. Not exactly the image that first comes to mind. The terrain was a more fitting background for a Western movie than an island getaway! In fact, some of the rough terrain that WesternGeco seismic Crew 1160 had to tackle was aptly nicknamed John Wayne country.
While it may appear as nothing but thorny prickles and scrub brush, Barrow Island is a "Class A" nature reserve and one of the most environmentally sensitive places on Earth.
By ARG Land Manager Bruce Clulow and Line Crewmember Justine Coetzee


The Gorgon CO_2 Seismic Survey on Barrow Island, Australia
The Gorgon Gas Project
The Gorgon Gas Project has generated an enormous amount of worldwide media, environmental, and government attention. The project is said to be the world's largest land CO_2 injection initiative and it is the first commercial energy project in Australia to significantly reduce greenhouse gas emissions by underground injection of carbon dioxide.
The project is based on the development of the Greater Gorgon gas fields, subsea gas-gathering infrastructure, and a liquefied natural gas (LNG) plant on Barrow Island. A key requirement of the development is the disposal of CO_2. The plan is to remove it during gas processing and then inject it into deep formations below Barrow Island, where it will be stored underground as an alternative to atmospheric emissions.
WesternGeco Crew 1160 was contracted by Chevron Australia Pty Ltd. to conduct a land and transition-zone 3D seismic survey to be used as a baseline for the Gorgon CO_2 sequestration project. The baseline survey was designed to image the CO_2 storage reservoir, pre-injection, as well as optimize future CO_2 injection well locations. Once injection begins, subsequent repeat (4D) surveys will monitor the CO_2 plume migration.
The concept of storing and injecting CO_2 back into the ground isn't new; it's already being done in the K12-B gas fields in the Dutch sector of the North Sea, and studies are being done in Victoria, Australia. According to Chevron Australia, the Gorgon Gas project is predicted to reduce its overall greenhouse gas emissions by approximately 40 percent or 3.4 million tons per annum. Crew 1160 is at the forefront of this mission. Experienced at working in complex areas and terrain and delivering quality data despite the technical challenges, WesternGeco was well equipped to face Barrow Island — and what better place to set a benchmark!
The Location
Barrow Island lies off the west coast of Australia. The island expands approximately 25 kilometers in length and 10 kilometers in width, covering 235 square kilometers, and was declared to be a "Class A" nature reserve in 1910.
There are no permanent human inhabitants on Barrow Island, except for a few Chevron employees. The rest of us fly in and fly out. The island belongs to the flora and fauna, some of which are unique to the area, including mammals such as the Barrow Island Chestnut Mouse, the Barrow Island Euro, and the Barrow Island Golden Bandicoot. The waters surrounding the island are an important protected area for the marine life, because it is a nesting and breeding area for green turtles, flatback turtles, dugongs, whales and dolphins. The coral reef, macro-algae and sea grass provide a perfect hiding and breeding place for the various species of fish found in these waters.
For you avid bird watchers, Barrow hosts approximately 128 species, of which about 32 breed on the island. So, if you're coming to work on the island remember to pack your binoculars! With such exciting and exclusive land and marine wildlife, it is clear to see why it was so critical that all operations left as little environmental impact as possible.
As expected, the quarantine restrictions are extremely stringent in order to protect the balance of this flourishing ecosystem. Everything must be thoroughly scrutinized, checked, and fumigated to the very last inch prior to being allowed on the island.
EcoSeis
As a "Class A" nature reserve, Barrow Island is subject to very stringent quarantine scrutiny and regulations. A strict environmental management plan, provided by Chevron, protects the island's unique flora and fauna and has enabled petroleum activities to successfully coexist with the island's nature reserve status.
To meet these stringent guidelines, Crew 1160 used the WesternGeco EcoSeis Inspection Monitoring System for field operations. This system used a selection of inspections, created specifically for this unique environment, to confirm minimal disturbance to the general flora and fauna, drill sites, and recording spread locations. In addition, the system enabled the reporter to maintain a consistency when carrying out inspections in the field on a day-to-day basis at varying locations. On the island, the inspections were tailored for the environment, with specific areas of concern and operations. These were then entered into QUEST as an audit, and necessary action items were assigned. A total of 69 EcoSeis inspections were carried out in the field: 42 on drill locations, 16 on line spread, and 11 on general areas.

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For more information about the Cisco Vision Digital Media Services,
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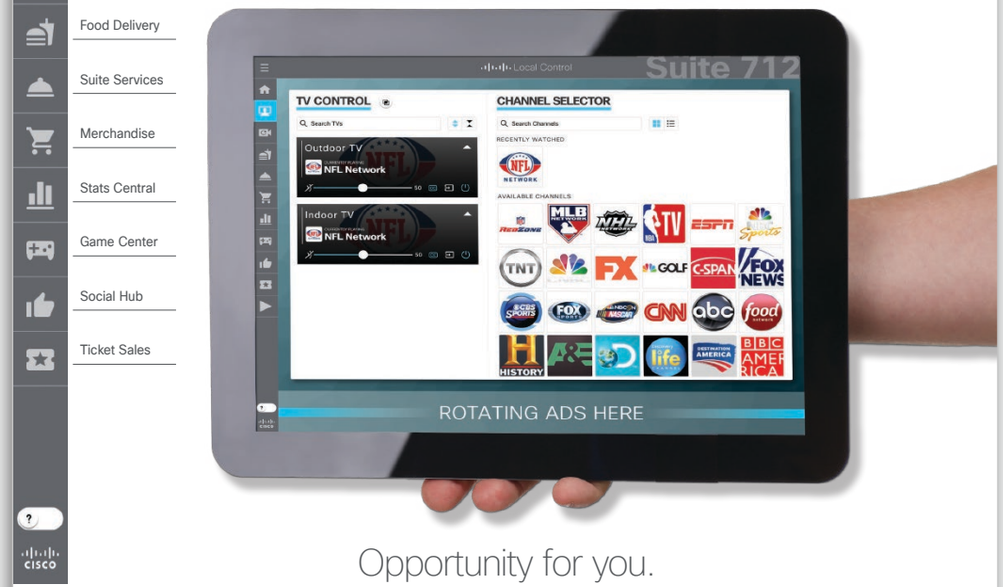

Control for your customers.

With the Local Control app, your customers will enjoy an expanded level of control that greatly enhances the experience you provide. The app features a robust and intuitive interface that affords customers easy command over a wide range of functions on multiple televisions. Suite services, food ordering, social media integration, merchandise shopping and much more can also be integrated to serve the needs that boost customer satisfaction.

Opportunity for you.

Increase your brand's exposure, lock in ad revenue, promote sponsors and build partnerships. Local Control places opportunities at your fingertips with a flexible solution built to maximize revenue channels. And as your business evolves, Cisco is there to help with custom solutions developed around your specific needs.

Brand Presence
Manage and highlight your brand throughout the app

Ad Carousel
Present enticing ads, linked to actionable web pages

Banner Ads
Showcase sponsors and bring them into the experience

TV Control
Grant guests control of their environment through TV options

Suite Services
Deliver consistent, personalized customer service at every level

Admin Services
Control any location from the Admin Portal, Review App performance, analytics and usage stats

Enhanced Experience
Guest recognition, augmented reality, game center, video replays and more.

cisco Vision

http://cs.co/CVLocalControl

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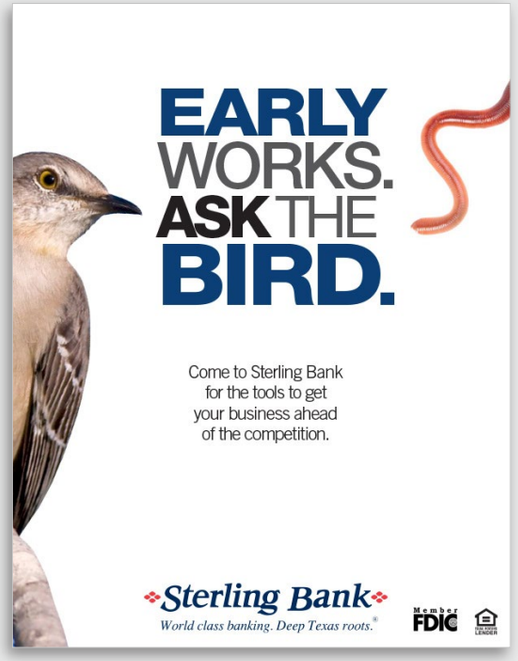
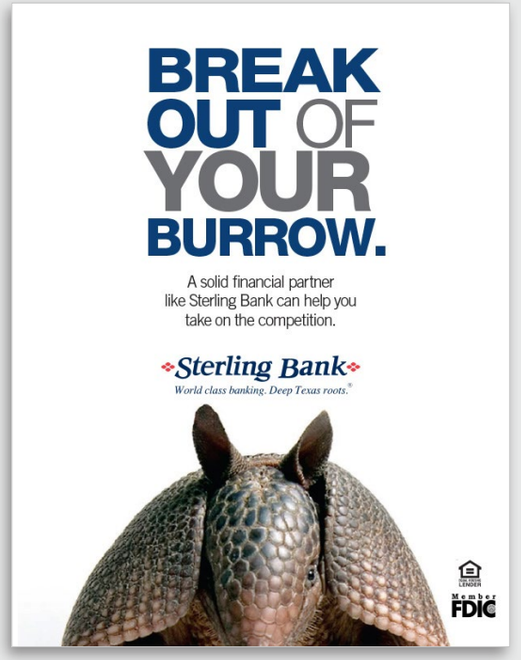
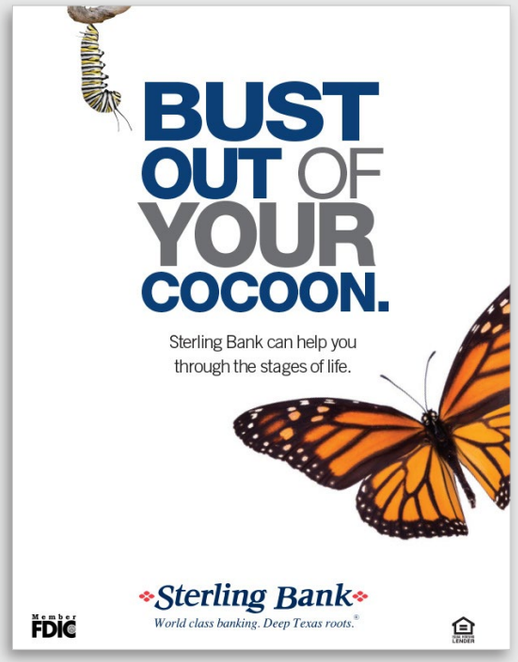
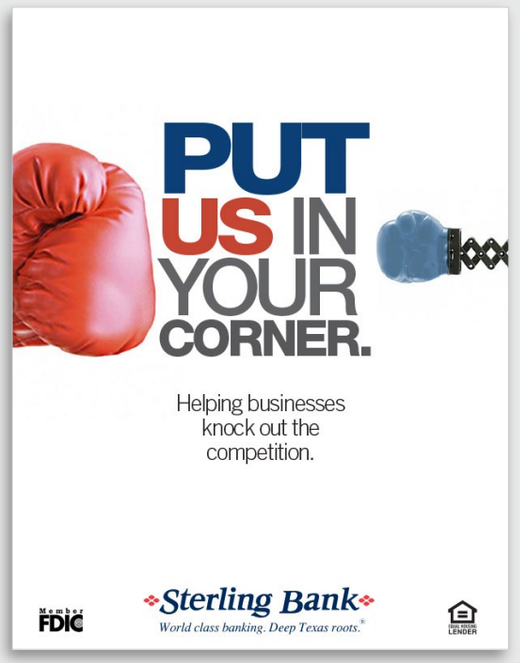


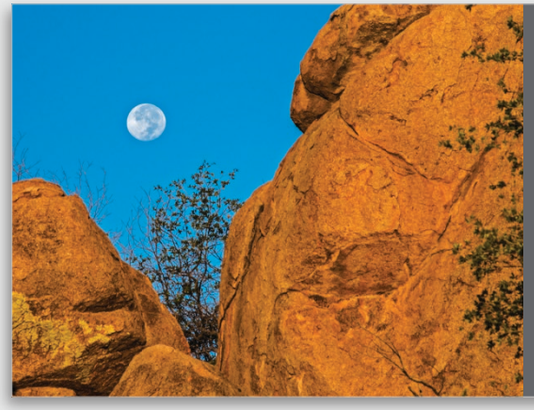






STERLING BANK | **Ad Campaign, Magazine** | Creative Direction and Design: Michael Clarke

MD ANDERSON CANCER CENTER | **Annual Report 2013** | Art Direction and Design: Michael Clarke | Editor: Sandy Stromberg | Photography: Wyatt McSpadden



seminal discoveries, cosmic changes

"We choose to go to the moon in this decade ... because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win ...."

President John F. Kennedy delivered those powerful words to a crowd of 35,000 people at Rice University more than 50 years ago. Today his message is once again a source of inspiration as MD Anderson continues the quest to eliminate cancer.

In 1962, the frontier was space.

In 2014, the frontier is ending cancer.

An ambition this big requires big ideas and big commitment.

To borrow again from President Kennedy: "Its conquest deserves the best of all mankind ...."

track the journey, lower the risk

The best defense is a good offense.

MD Anderson physicians and researchers are breathing new life into that old adage with their work in cancer prevention and risk assessment. They're discovering ways to detect the disease at its earliest stages by examining how genetic, environmental and behavioral factors contribute to its development. The earlier cancer is caught, the better our chances of curing it. In addition to detection, they're educating the public about lifestyle changes and choices that can help prevent the disease altogether.

enhance patient experience, build networks

For most people with cancer, it's the toughest fight of their lives. MD Anderson is committed to doing everything possible to make the experience easier. From providing multiple therapeutic options and making treatment more convenient, to simply having a friendly face there to offer a smile and a cup of coffee, reducing stress and improving quality of life are important to overcoming the disease.

In the face of cancer

annual report 2015

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

Patient Care

Jim Boysen, 56
Leiomyosarcoma survivor

Being the first person to undergo a skull and scalp transplant gave Jim Boysen a new lease on life.

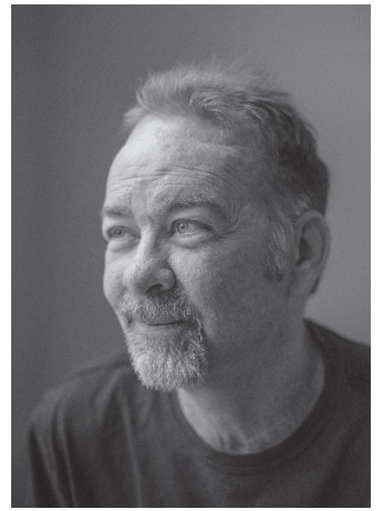
Chemotherapy and radiation treatment for leiomyosarcoma — a rare cancer of the smooth muscle under the scalp — left Boysen with a deep head wound that immune suppression drugs kept his body from healing. He was taking the drugs to prevent his body from rejecting a transplant he received more than 20 years ago because of complications from diabetes. In turn, the open wound stood in the way of a much-needed second kidney and pancreas transplant.

Reconstructive plastic surgeon Jesse Selber, M.D., saw Boysen as an ideal candidate for a first-of-its-kind composite tissue transplantation in which the 56-year-old received a partial skull and scalp, a pancreas and a kidney, all at once.

"This has been a long journey, and I am so grateful to all the doctors who performed my transplants," says Boysen, who is back at home in Austin and doing well. "I'm amazed at how great I feel and am forever grateful that I have another chance to get back to doing the things I love and be with the people I love."

Read more about Boysen's groundbreaking surgery on Page 9.

From first-ever surgeries to translational research and drug discoveries that are yielding previously unheard of benefits for patients, MD Anderson's faculty members and staff continue to improve and advance treatment options. Last year, the institution's doctors, nurses and other cancer fighters cared for more than 267,000 patients in the Houston area and through its Cancer Network, which is making MD Anderson-quality care accessible to more people.



The man who helped cure childhood leukemia

By Ronda Wendler

A trailblazing oncologist who took on childhood leukemia by introducing combination chemotherapy — in which anticancer drugs are given simultaneously rather than singly — retired in September after 50 years at MD Anderson.

Yet Emil J Freireich, M.D., 88, who achieved legendary status as a pioneer in the early history of oncology triumphs, still comes to work every day, attending meetings and participating in the center's medical education program.

Retirement is "just a suggestion," Freireich says. "I'm too motivated to lounge around the house like a dried-up old geezer."

Freireich's motivation to stop cancer was born back in 1955 when he was hired at the fledgling National Cancer Institute (NCI) in Bethesda, Maryland. Built "way out in the country" on the campus of the National Institutes of Health, the center was the first full-time, patient-oriented clinical research center in the world. It was there that Freireich would alter the course of childhood leukemia for millions of patients in the years to come.

Stop the bleeding

On his first day at the institute, Freireich was assigned to care for children in the leukemia ward — a job no one else wanted.

"Leukemia at that time was a horrible illness — a death sentence," he says. "Most children lived only eight weeks after being diagnosed. Ninety-nine percent died within a year."

His first order of business was to halt the nonstop bleeding that is the hallmark of the disease.

"Leukemia prevents blood from clotting," he explains. "Children bled to death. The leukemia ward looked like a slaughterhouse. Blood covered the pillowcases, the floor, the walls ... it was horrific."

Early chemotherapy drugs were available, but patients bled to death before they could undergo treatment.

Freireich firmly believed his patients' bleeding was caused by insufficient platelets — tiny blood cells that help the body form blood clots. Recent research revealed that the platelets of World War II atom bomb victims had been wiped out by radiation, and that those victims died from hemorrhaging. The connection was indisputable, Freireich believed. Yet the medical community dismissed his idea.

To prove them wrong, Freireich mixed platelets from his own blood with blood from leukemic children. Without fail, the bleeding stopped.

Further studies confirmed not only that Freireich had been right all along, but also his belief that platelets were useless unless they were obtained from fresh blood.

"Platelets in donated blood last only 48 hours," he explains. "Because blood bank protocol demanded that the oldest blood be used first, the children all along had been getting blood that was too dated to contain platelets."

With these discoveries, bleeding as a cause of death was essentially eliminated.

Combo Chemo

With the bleeding problem solved, Freireich turned his attention to curing childhood leukemia. Another difficult-to-treat disease, tuberculosis, recently had been cured. He believed the TB treatment approach might work for leukemia as well.

"We knew that three drugs controlled tuberculosis, but you had to administer them all at once. If given separately, they didn't work," he says. "I had an inkling the same method would work for leukemia."

So Freireich began combining chemo drugs instead of giving them one at a time.

First he administered two of the highly toxic drugs, then three. With each addition, children became seriously ill, and some were brought to the brink of death. When he upped the ante to four drugs in a 1961 trial, an outcry arose from the medical establishment.

"They said I was unethical and inhumane and would kill the children. Instead, 90 percent of them went into remission immediately. It was magical."

Once children were in remission, Freireich continued their four-drug regimen for a full year to kill any residual cancer cells. That exact strategy, called early intensification, is still used today, and the cure rate for childhood leukemia is 92%.

Looking ahead

In 1965, Freireich and his NCI friend and colleague Tom Frei, M.D., were recruited by MD Anderson to launch a chemotherapy program. Until then, the cancer center had treated patients with surgery and radiation. The two doctors formed the Department of Developmental Therapeutics and hired brilliant young scientists who developed drug combinations that cured various cancers based on the same methods used to treat childhood leukemia. Today, nearly all successful chemotherapy regimens use this approach of administering multiple drugs simultaneously.

Curing cancer isn't synonymous with eradicating cancer, Emil J Freireich points out.

Our bodies contain 70 trillion cells, and when one of them misbehaves, you can get cancer. With that many cells, he says, mathematically, there's great potential for error.

"Cancer will always be around, but every day we're curing more and more patients who live a long time and do great things after their disease."

Legendary oncologist Emil J Freireich, M.D.

MD ANDERSON CANCER CENTER | **Annual Report 2015** | Art Direction and Design: Michael Clarke | Editor: Sandy Stromberg | Photography: Wyatt McSpadden

Tanning bed ban for minors is a major step

By shining a light on critical clinical and research implications, collaborators from the Melanoma Moon Shot, the Cancer Prevention and Control platform and outside advocates attacked a deadly disease on an unexpected front: state health policy.

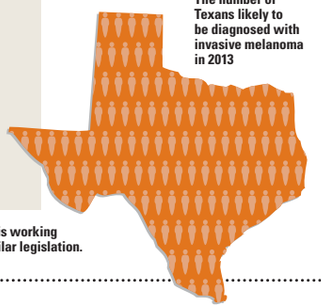
MD Anderson joined advocacy organizations from across the state to educate legislators about the dangers of tanning beds, and, on Sept. 1, 2013, a new Texas law took effect prohibiting anyone under the age of 18 from using them.

1,454

The number of tanning beds (or tanning salons) in Texas affected by the law
(Salons with current tanning licenses in Texas, according to the Texas Department of State Health Services)

Nearly 4,000

The number of Texans likely to be diagnosed with invasive melanoma in 2013



MD Anderson currently is working with other states on similar legislation.

"When I was **16 years old** growing up in West Texas, it was a **big deal** to be **tan for prom** and other big events. I thought a tan was a symbol of beauty, and I wanted to look like my friends. Now, after **two surgeries** for **two melanomas,** three children and many years of thinking back on my tanning bed experience, **beauty is not found in the color of your skin.** It's about living a long life well."

Susanna Cutrone of Austin
Melanoma survivor who told her story to the Texas Senate Health and Human Services Committee

In addition to MD Anderson, supporters of the Texas tanning bed legislation included:

- Texas Dermatological Society
- American Cancer Society
- Texas Medical Association
- Texas Academy of Family Physicians
- Texas Pediatric Society
- Texas Hospital Association
- Texas Association of Health Plans
- Blue Cross Blue Shield of Texas

6

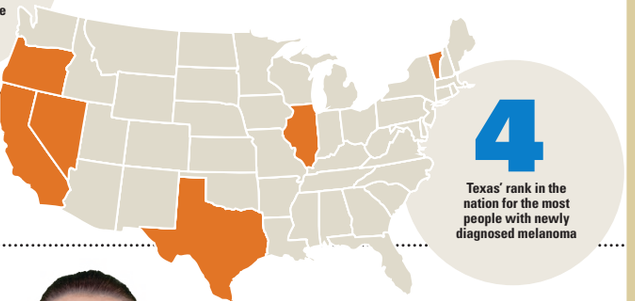
The number of states that ban access to tanning beds for those under the age of 18

170,000

The number of extra cases of skin cancer per year in the United States for which tanning beds are responsible

$5 billion

The estimated overall financial burden for diagnosing and treating melanoma and other skin cancers in the United States



3%

Approximate increase in the incidence of melanoma per year in the U.S.

4

Texas' rank in the nation for the most people with newly diagnosed melanoma

The average **17-year-old girl** in the United States tans about **25 times a year,** and the risk of melanoma goes up with increased tanning.

85%

Increase in melanoma risk for people starting indoor tanning before the age of 18

UV radiation and UV-emitting tanning devices are classified as **carcinogens** and are on the same World Health Organization list of carcinogens as tobacco smoke and plutonium.

Fact:

There were 14.1 million new cancer cases worldwide in 2012.

Most cancer patients can't travel to MD Anderson for the expert care that comes from more than 70 years of institutional expertise fighting the disease. In the short term, the fastest way to improve patient outcomes on a global level is to elevate and standardize cancer care in communities served by MD Anderson's network of partners throughout the U.S. and around the world.

Question:

If patients can't come to MD Anderson, can we take MD Anderson to them?

Answer:

By combining **science, engineering and medicine,** and by making use of **advances in technologies,** MD Anderson can share its knowledge base and bridge the gap in treatment.

The MD Anderson Oncology Expert Advisor™, powered by IBM Watson, can help do that.

The Oncology Expert Advisor is capable of:

Reading and remembering millions of pages of medical literature and practice guidelines.

Matching patients to clinical-trial protocols

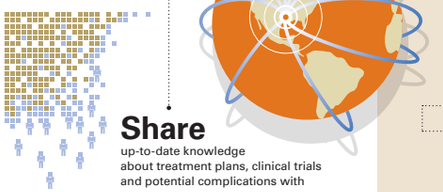
Continually "learning" over time from aggregated genomic research and clinical data from all patients.

Ranking potential treatment options based on the most up-to-date medical evidence.

Offering care advice to help manage a patient's treatment by alerting less experienced physicians or nonspecialists to aspects of therapy they might not be aware of or overlook.

What OEA can do tomorrow:

Extend the reach of MD Anderson care beyond Houston, the state of Texas and the United States by capturing its oncology expertise and delivering it to a larger group of patients. In turn, that rising sea of patient data, which is increasingly more representative of the world's population, informs OEA to continuously supply patients and providers with the best options and improve outcomes.



Share up-to-date knowledge about treatment plans, clinical trials and potential complications with oncologists worldwide. Global access to MD Anderson's expertise can raise the standard of cancer care for all. As it serves as a virtual advisor, OEA collects data from a larger and more diverse patient population.

See what can happen in a year at www.mdanderson.org/MoonShotsMilestones.

When we succeed, we can create a more effective patient-centric care model by:

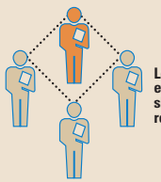
Elevating and standardizing universal cancer care by providing up-to-date knowledge to oncologists

Increasing access to higher-quality care

Decreasing the cost of access to this improved care

Mitigating the problem of physician shortage

More efficiently turning research discoveries into real-world care



Learning from every patient by sharing treatment response data

MD ANDERSON CANCER CENTER | **Annual Report 2016** | Art Direction and Design: Michael Clarke | Editor: Andy Olin

photo by Adolfo Chavez III

"We have every opportunity in the world to find here in Houston the answer to the question of the cause and cure of cancer."

— Dudley Woodward, chairman of The University of Texas System Board of Regents from 1944-55

75 years of discovery

Since day one, MD Anderson researchers have worked tirelessly to find an answer to cancer. In that time, they've made great progress in understanding the disease — how it adapts, survives and spreads. Three-quarters of a century later, the institution's labs and research institutes continue to turn out discoveries and breakthroughs that lead to better and more effective treatments for cancer patients.

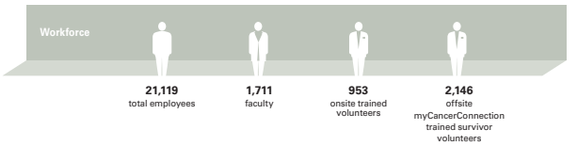
In many of today's labs, experts from different fields who have a shared research vision are brought together in the same space to encourage collaboration, communication and creativity, which are vital to the rapid and dramatic reductions in death and suffering that are at the heart of the Moon Shots Program™.

Our doctors and researchers are building on the success of immune checkpoint blockade drugs, which are now approved for many late-stage cancers. They also are learning why these drugs don't work for all patients. And, through the Moon Shots™ platforms, new and innovative drugs and therapies are being developed to fight the disease.

And the research continues to pay off. Just as the amount of money invested in cancer research at MD Anderson has grown each year — from just over $15,000 in 1944, to more than $787.3 million in 2016 — the five-year survival rates for cancer patients have continued to rise.

Clinical profile

	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Hospital admissions	26,726	27,905	27,761	28,167	27,391
Patient days	191,735	202,553	202,636	202,483	198,080
Average daily census	536	569	571	574	561
Average length of stay	7.2	7.3	7.3	7.2	7.2
Average number of inpatient beds	616	635	654	665	661
Outpatient clinic visits, treatments, procedures	1,281,489	1,338,706	1,363,008	1,440,684	1,404,329
Pathology/laboratory medicine procedures	11,619,591	11,718,405	12,005,766	12,334,917	12,073,679
Diagnostic imaging procedures	497,660	501,887	523,297	530,590	524,044
Surgery hours	66,241	70,221	69,506	69,987	67,936
Total active clinical protocols	1,078	1,065	1,101	1,197	1,202



21,119 total employees

1,711 faculty

953 onsite trained volunteers

2,146 offsite myCancerConnection trained survivor volunteers

MD Anderson provided more than **$287.3 million** in uncompensated care to Texans with cancer in FY15.*

**This figure includes unreimbursed costs of care for patients who either have no insurance or are underinsured, or whose care was not fully covered by government-sponsored health programs.*

121,356 volunteer hours

Total philanthropic gift support by type

Cash gifts	Amount
Corporations	$11,248,710
Foundations	33,921,440
Individuals	61,162,580
Organizations	3,716,324
Trusts and estates	7,838,449
Subtotal	**$117,887,503**

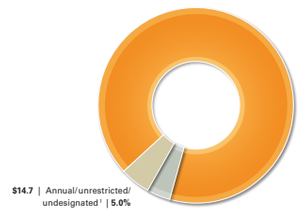
Pledge gifts	
Corporations	$13,586,781
Foundations	42,853,552
Individuals	45,965,177
Organizations	18,605,370
Trusts and estates	54,896,801
Subtotal	**$175,907,681**

Gifts-in-kind	
Corporations	$216,271
Foundations	1,771
Individuals	18,396
Organizations	6
Subtotal	**$236,444**

TOTAL	**$294,031,628**

[1] *These dollars fund institutional peer-reviewed research.*
[2] *Donor-targeted gifts to research conducted in all mission areas.*

Total philanthropic gift support by purpose (in millions)



$267.6 | Research[2] | **91.0%**

$14.7 | Annual/unrestricted/ undesignated[1] | **5.0%**

$11.8 | Education/prevention/ patient assistance | **4.0%**


Tabú
COFFEE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savsu™
TECHNOLOGIES


GreenHouse
INSURANCE


MD Anderson Cancer Center
Department of Cardiology


airGUARD
MEDICAL PRODUCTS CO.


AV
SYSTEMS
AUDIO VISUAL SYSTEMS, INC.


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women owned
women inspired


OLIVIER
VIDEO PRODUCTIONS

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Alternate Design Candidates

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cell and gene therapy tools

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cell and gene therapy tools

Final Redesign

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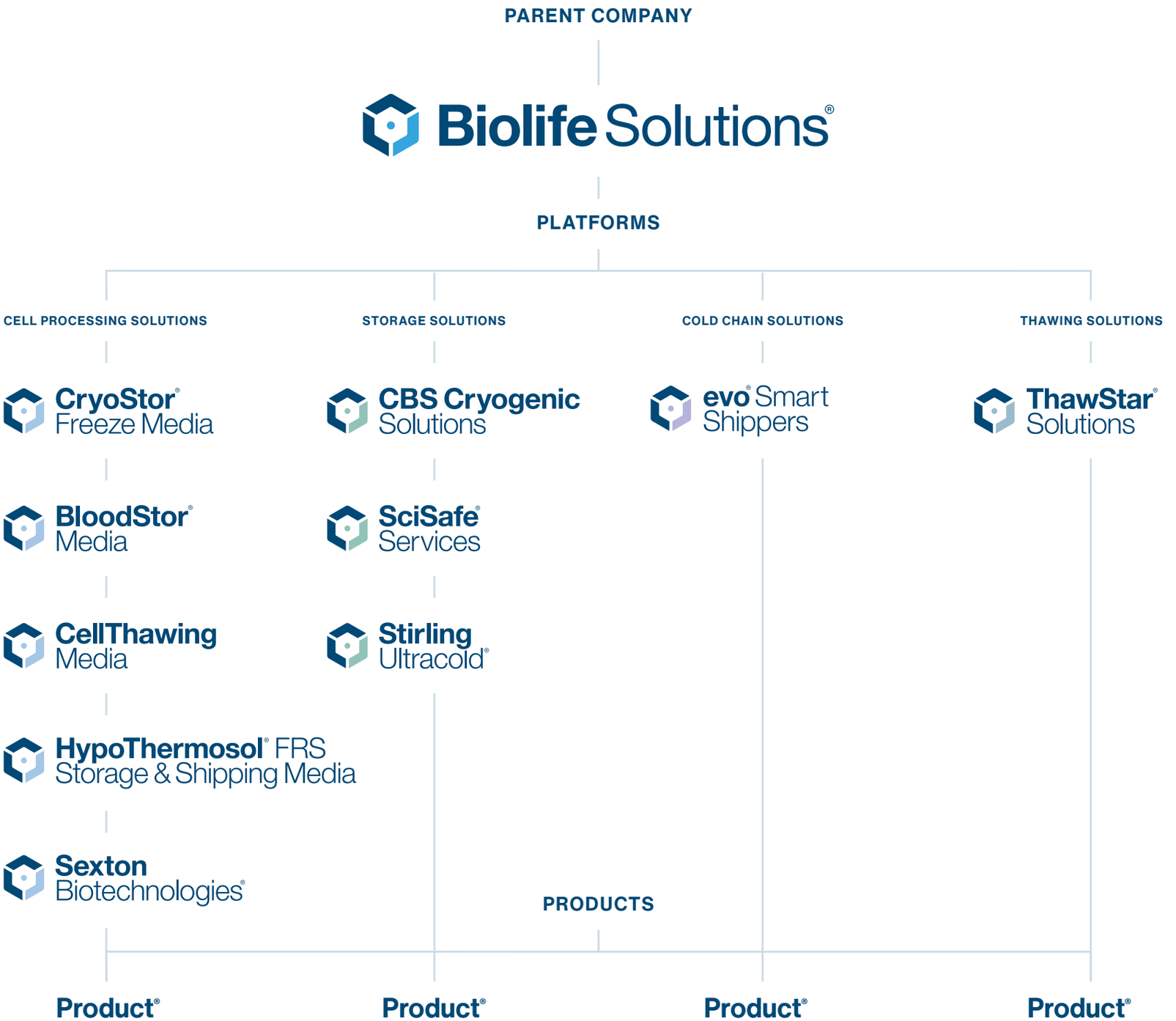
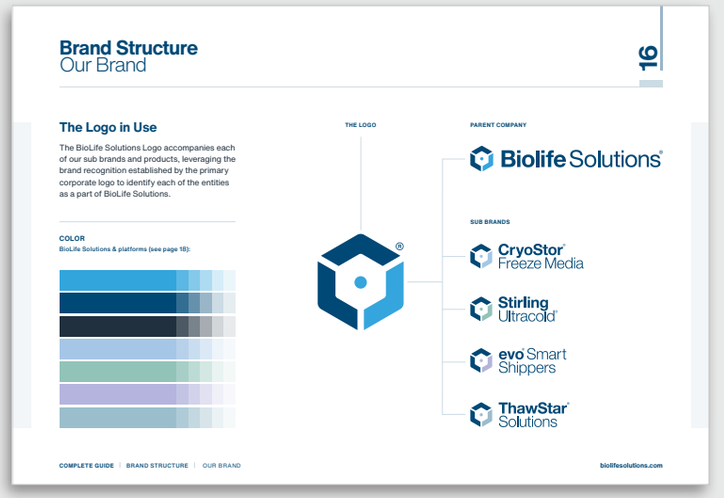


BIOLIFE SOLUTIONS | **Brand Architecture Representing Partial Acquisitions** | Creative Direction: Michael Clarke | Design: Michael Clarke, John Dunne, *The Unknown Creative*


Biolife Solutions®
COMPLETE GUIDE
Complete Brand Guide
VERSION 1.0 – MAY 2023


Biolife Solutions®
04
The BioLife Solutions Logo is intended to be easily identifiable by our customers, suppliers, vendors, partners and shareholders. As the symbol element of the core logo, it is also featured in all of our sub brand logos. The logo can be seen and recognized without any words; providing an instant way for stakeholders to understand that each brand is part of the BioLife Solutions family. The Logo symbol element of the core logo represents protection, risk reduction, bioproduction process and living biologic material; and our products and services do this; preservation media, thaw systems, freezers, cell processing products, smart transport containers and storage services.
Our Logo
Our Logo is conceived as an abstract representation of a box within a box, containing and safeguarding a single cell. This design references a core function of the solutions that we provide — protection of a living therapy.
COMPLETE GUIDE | OUR LOGO
biolifesolutions.com


Brand Structure
Our Brand
16
The Logo in Use
The BioLife Solutions Logo accompanies each of our sub brands and products, leveraging the brand recognition established by the primary corporate logo to identify each of the entities as a part of BioLife Solutions.
COLOR
BioLife Solutions & platforms (see page 18):
THE LOGO
PARENT COMPANY
Biolife Solutions®
SUB BRANDS
CryoStor® Freeze Media
Stirling Ultracold®
evo Smart Shippers
ThawStar® Solutions
COMPLETE GUIDE | BRAND STRUCTURE | OUR BRAND
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Seal the deal.

From concept to commercialization, the CealSeal AF-500 delivers the automation difference in a precision engineered and GMP compatible fill-finish system.

For cell and gene therapy developers and manufacturers, the AF-500 provides the path to scale up and standardize through increased accuracy, speed, and productivity. Its versatile design for controlled environments include benchtops, biosafety cabinets, or an isolator.

We Know
Cell Processing.

Biolife Solutions®

Go the Distance.

It's more than just a shipper. It's connected and secure.

The evo DV10 Smart Shipper represents the best-in-class performance for cell and gene therapy logistics management. Designed to handle high-value payloads for long-haul international or bulk shipments, the performance is outstanding. With an internal temperature of ≤-180°C, DV10 Smart Shipper can be upright or on its side during transportation without failure. DV10 is also the fastest LN2 charging unit on the market.

We Know
Cold Chain.

Biolife Solutions®

Stayin' Alive.

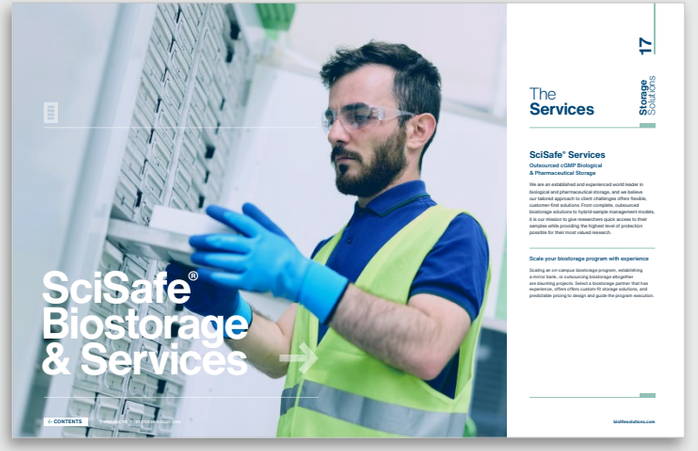
The CryoStor® series of cell-specific, optimized freeze media, is designed to prepare and preserve cells in ultra-low temperature environments (-70°C to -196°C).

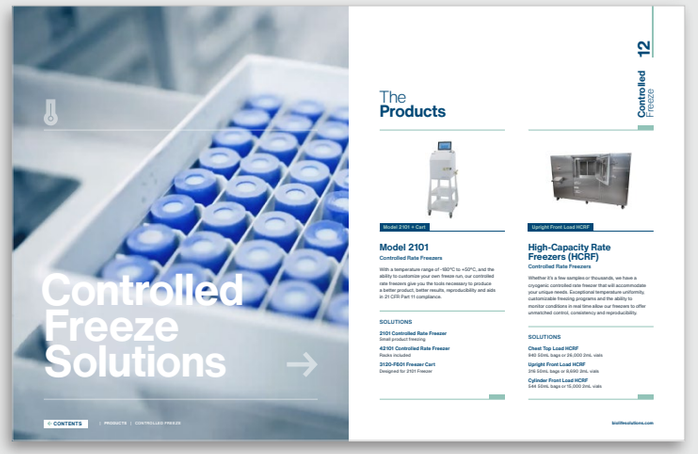
CryoStor CS10, pre-formulated with 10% DMSO, provides a safe, protective environment during the freezing, storage, and thawing process for cells and tissues with a requirement for 10% DMSO. Through modulating the molecular-biological response to the cryopreservation process, CryoStor provides for enhanced cell viability and functionality while eliminating the need for serum, proteins or high levels of cytotoxic agents.

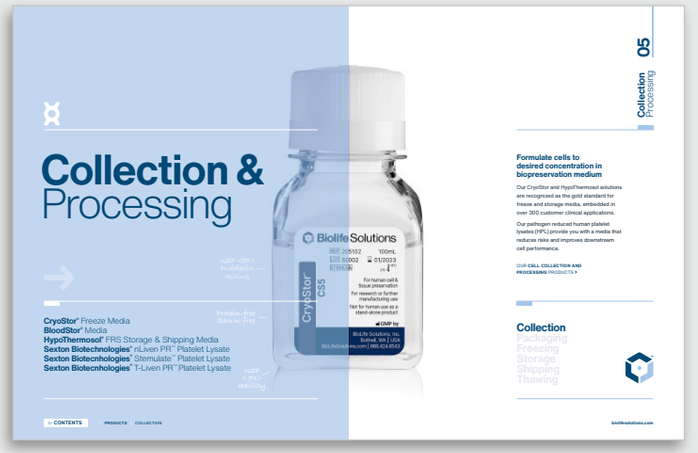
We Know
Cell Processing.

Biolife Solutions®

BIOLIFE SOLUTIONS | **Product Promotion, Digital Signage** | Art Direction and Design: Michael Clarke







BioLife Solutions | **Product and Solutions Brochure** | Creative Direction: Michael Clarke | Art Direction and Design: John Dunne, *The Unknown Creative*

IntelliRate i67C

mod pak™
Modular Cryogenic Packout Kit

evo® DI
Smart Shipper

Isothermal
V-3000AB
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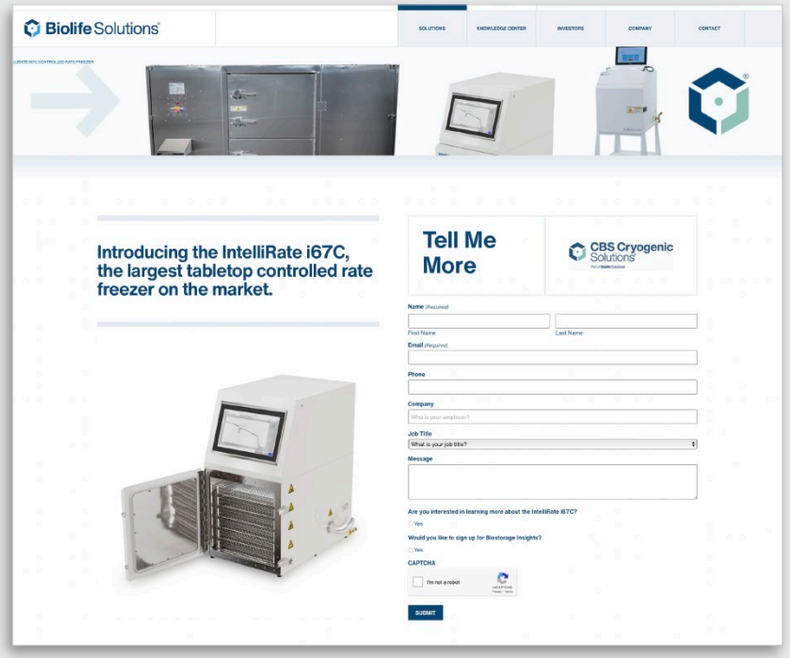
CryoStor®
Freeze Media

Destination Landing Page

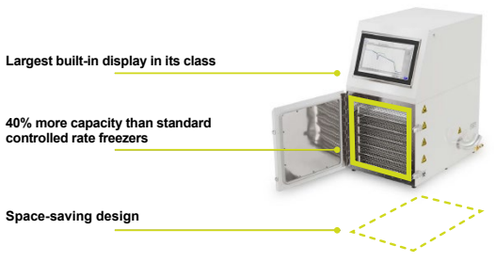


CBS Cryogenic Solutions
Part of Biolife Solutions

We do small in a really BIG way.

With the smallest footprint of any controlled rate freezer in its class and **40% more freezing capacity**, our new **Intellirate™ i67C** can serve your workflow in a big way.

Designed to meet the growing demand for larger batch sizes, the **IntelliRate i67C** enhances post-thaw viability rates and quality at scale. This advanced freezer can accommodate **over 2,000 2mL vials or 104 50mL bags in a single operation**. Its efficiency not only saves time but also reduces LN2 usage, all while maintaining a footprint comparable to smaller benchtop models.



Join us in exploring the IntelliRate i67C's transformative impact on cell and gene therapy practices. Visit us at ISCT in Paris to witness firsthand the next stage of controlled rate freezing.

Learn more

Biolife Solutions
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CBS Cryogenic Solutions
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Bigger Chill, Smaller Bill.

Lower costs and improve workflow with increased capacity in a small footprint.

The new **IntelliRate i67C** is designed to increase single-batch, liquid nitrogen (LN2) controlled rate freezing (CRF) capacities to meet your needs as development and manufacturing volumes increase. **With upgraded capacity and the smallest footprint in its class, the IntelliRate i67C can help reduce your costs and support greater post-thaw viability rates at scale.**

What can you do with more capacity?

Save time

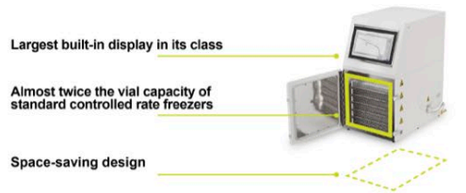
Freeze **2,000 2mL vials** or **104 50mL bags** in a single run, reducing time required to process your samples.

Save money

Purchase one freezer that does the work of two. Use less LN2 by freezing more in each run.

Save space

The Intellirate's compact footprint and its enhanced capacity allows you to do more work in less space and with fewer freezers.



Discover how the IntelliRate i67C can help you reduce costs, save space, and improve outcomes.

Learn more

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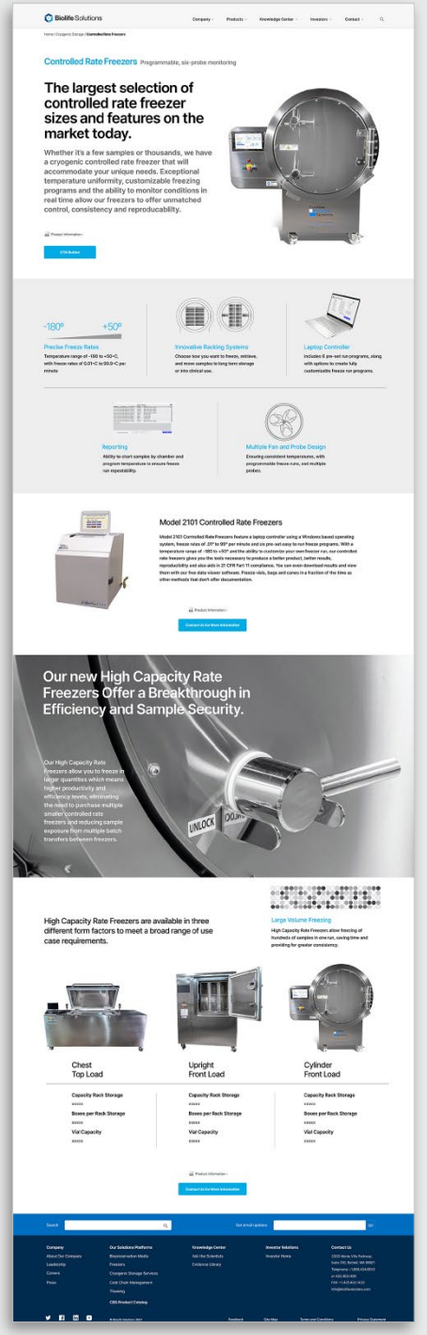
Biopreservation Media Solutions

The industry standard in biopreservation media

Success in the regenerative medicine, biobanking, and drug discovery industries depends on the shelf life and viability of cells, tissues, and organs designated for research or clinical applications. We can help you be successful with best-in-class, cGMP-grade biopreservation media products that significantly extend stability and improve post-biopreservation viability and function of your biologic source material, intermediates, and final products.

BIOLIFE SOLUTIONS | **Website 2021 Launch** | Creative Direction and Design: Michael Clarke



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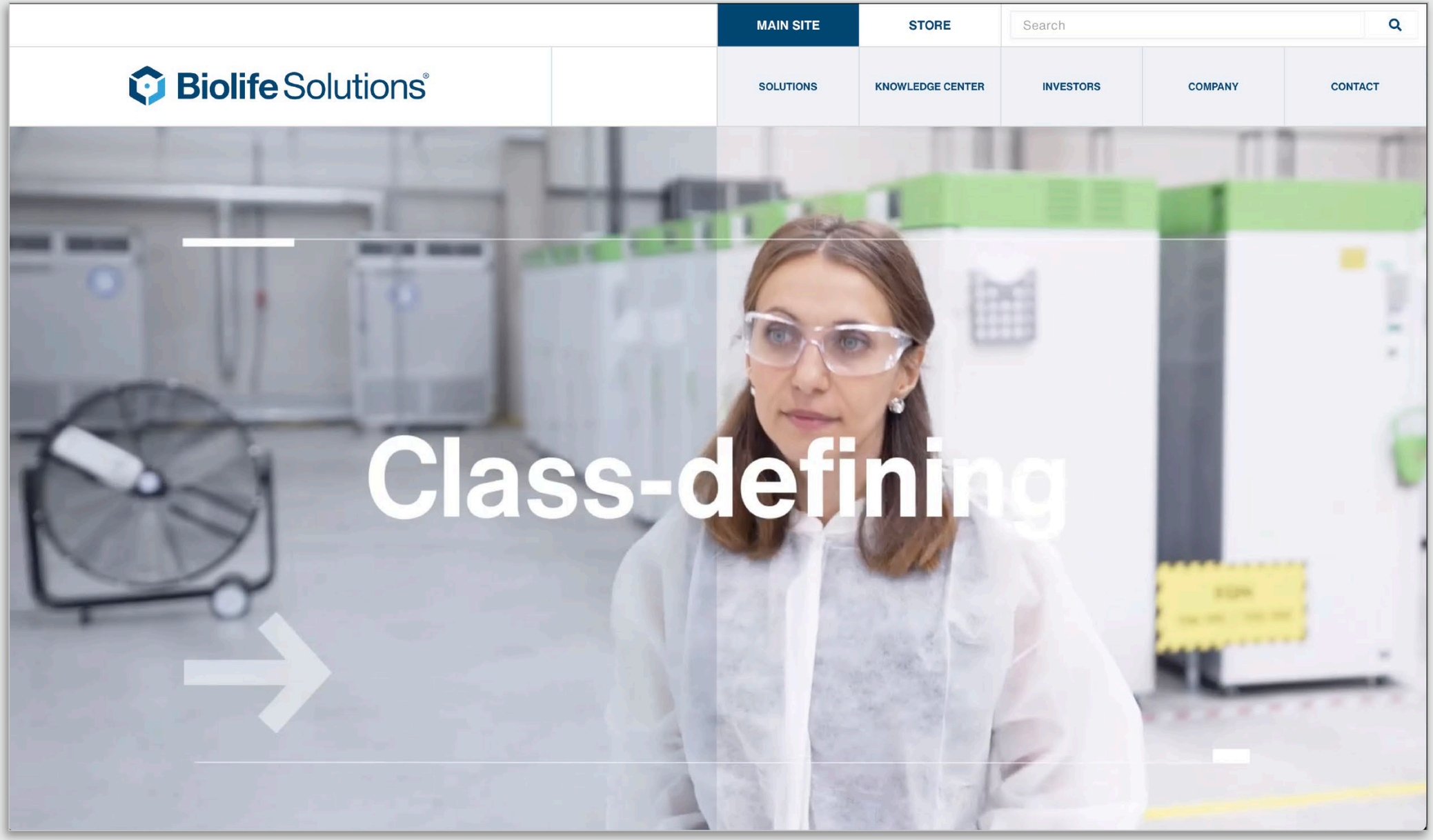

→ VISIT BIOLIFESOLUTIONS.COM

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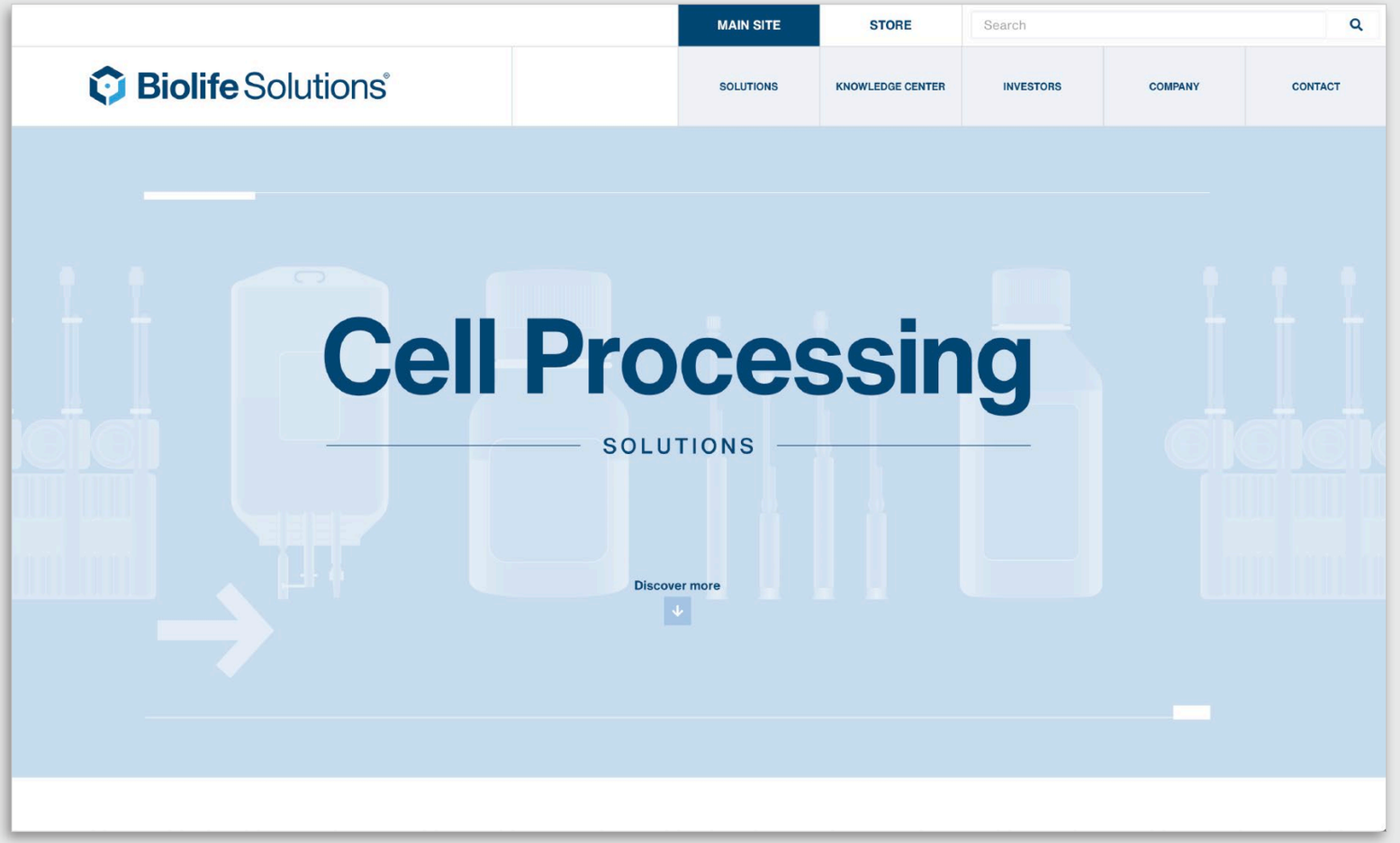

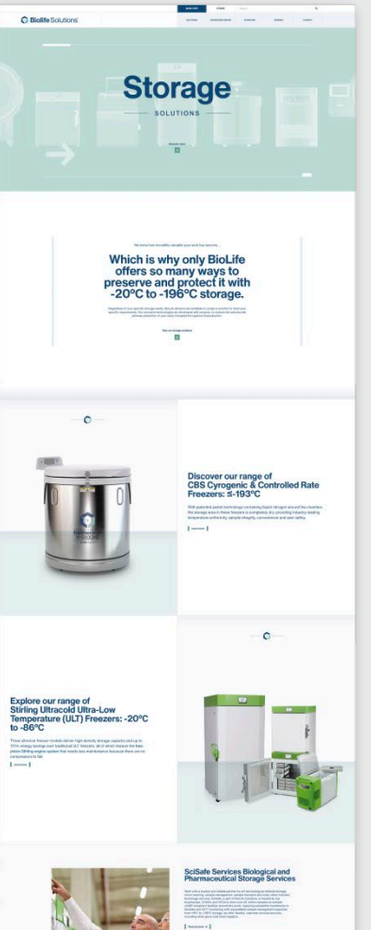

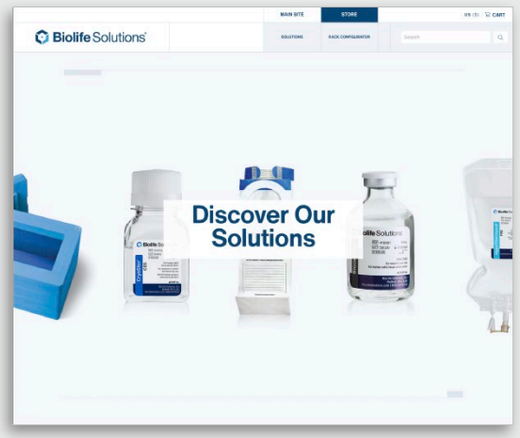

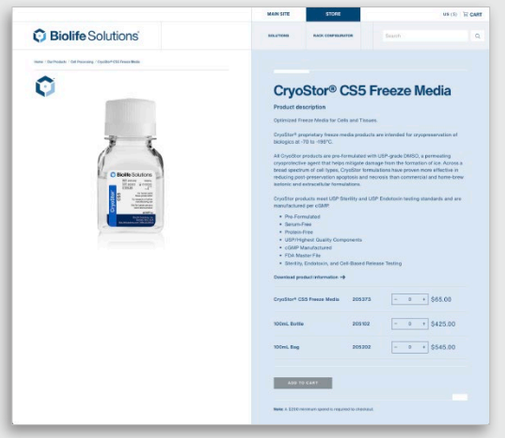

BIOLIFE SOLUTIONS | **Website 2022 Launch** | Creative Direction: Michael Clarke | Art Direction and Design: John Dunne, *The Unknown Creative*

Now through
December 31, 2022

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Purchase an SU780XLE and receive half your racks for FREE*

- Revolutionary engine design
  Only two moving parts and no compressors
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  Maintain temperature protection in cabinet while maximizing storage
- Program a temperature
  Anywhere between -20°C to -86°C and maintain temperature uniformity

Stirling Ultracold® Part of Biolife Solutions

We know cold®

Biolife Solutions®

Isothermal Cryogenic Dry-Vapor Freezers

Isothermal Carousel

avantor delivered by VWR VWR.COM

CBS Cryogenic Solutions Part of Biolife Solutions

Innovative design eliminates liquid nitrogen (LN2) in the storage area.

Our Isothermal Carousel V-Series freezers take LN2 cryogenic storage to the next level, engineered to maximize sample integrity. Our advanced technology includes an LN2 filled jacket that surrounds the chamber to provide completely dry storage, industry-leading temperature consistency throughout the chamber, and increased usable storage space.

Hatch-style removable lid with two lid holders

- Rotating carousel with our unique ratchet handle to easily find and remove the rack you need.
- Allowing quick access to racks helps limit exposure to ambient air and reduce LN2 consumption.
- By removing the console you have quick access to racks in case of emergency.
- Carousel models are ideal for labs and buildings where there are ceiling restrictions.

Why is dry storage important?

Safety. In standard cryogenic freezers, glass vials contaminated with LN2 can explode from rapid pressure expansion when trapped LN2 changes to vapor phase. **Isothermal technology ensures that your vials** are never exposed to LN2 in the chamber, eliminating contact with, or seepage into vials. Our design provides added user safety by eliminating contact with or splashing of liquid nitrogen.

Cross-Contamination. Dry storage greatly reduces the possibility of cross-contamination. Studies have shown that viral, bacterial and fungal pathogens can survive after suspension in liquid nitrogen. Infected samples can cross-contaminate other samples.

Storage Solutions

High Capacity Rate Freezers (HCRF)

We know cold.

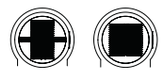
Introducing our newest cryogenic freezer innovation — the High Capacity Rate Freezer

Precise Freeze Rates

Temperature range of -180 to +50°C, with freeze rates of 0.01°C to 99.9°C per minute

Large Volume Freezing

Capacity to freeze hundreds of samples in one run, saving you time and ensuring consistency in freeze runs.



Innovative racking systems

Choose how you want to freeze, retrieve, and move samples to long term storage or into clinical use.

Laptop Controller

Includes 6 pre-set run programs, but also giving you the options to create your own freeze run programs.

Reporting

Ability to chart samples by chamber and program temperature to ensure freeze run repeatability.

Biolife Solutions CBS Freezers

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Shelburne
Wide-Azimuth Project
Largest WesternGeco seismic survey ever acquired in North America for a single client


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The Fleet
Efficiency and Reliability
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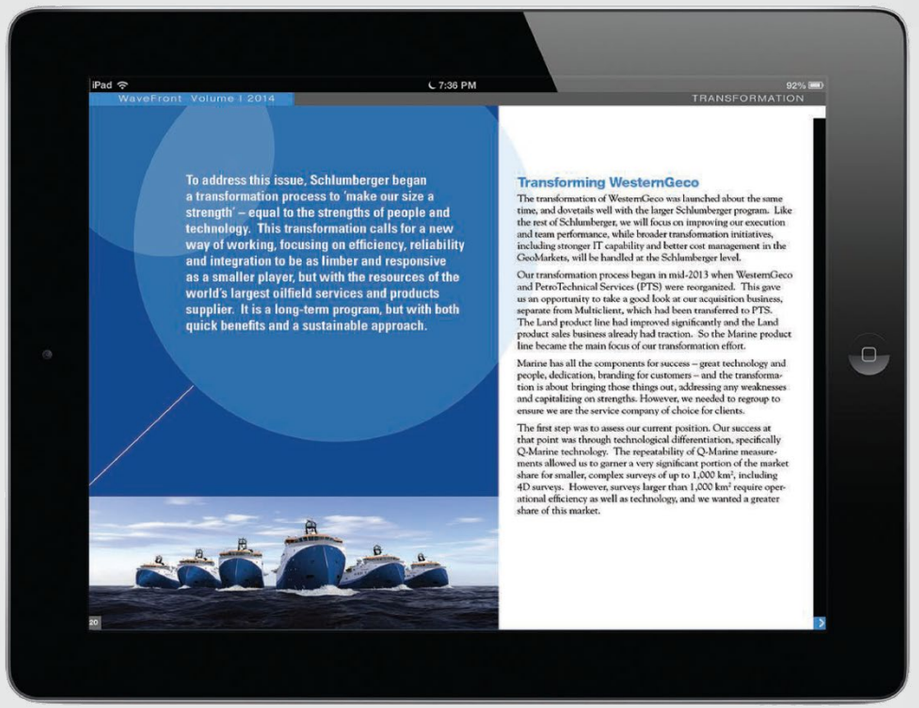
customer engagement
technical sales
commercial response
3D broadband imaging
efficient exploration
optimize fleet size
maximize towing capacity
shoot faster
operations team performance
LET THE TRANSFORMATION BEGIN
By Rich Cieslewicz, Transformation Manager and Rhonda Boone
As the Schlumberger population hit 120,000 and the company became larger in terms of market capitalization than all three main competitors combined, questions began to be raised: was the company too big to be competitive; too big to grow any further?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TRANSFORMATION
To address this issue, Schlumberger began a transformation process to 'make our size a strength' – equal to the strengths of people and technology. This transformation calls for a new way of working, focusing on efficiency, reliability and integration to be as limber and responsive as a smaller player, but with the resources of the world's largest oilfield services and products supplier. It is a long-term program, but with both quick benefits and a sustainable approach.
Transforming WesternGeco
The transformation of WesternGeco was launched about the same time, and dovetails well with the larger Schlumberger program. Like the rest of Schlumberger, we will focus on improving our execution and team performance, while broader transformation initiatives, including stronger IT capability and better cost management in the GeoMarkets, will be handled at the Schlumberger level.
Our transformation process began in mid-2013 when WesternGeco and PetroTechnical Services (PTS) were reorganized. This gave us an opportunity to take a good look at our acquisition business, separate from Multiclient, which had been transferred to PTS. The Land product line had improved significantly and the Land product sales business already had traction. So the Marine product line became the main focus of our transformation effort.
Marine has all the components for success – great technology and people, dedication, branding for customers – and the transformation is about bringing those things out, addressing any weaknesses and capitalizing on strengths. However, we needed to regroup to ensure we are the service company of choice for clients.
The first step was to assess our current position. Our success at that point was through technological differentiation, specifically Q-Marine technology. The repeatability of Q-Marine measurements allowed us to garner a very significant portion of the market share for smaller, complex surveys of up to 1,000 km², including 4D surveys. However, surveys larger than 1,000 km² require operational efficiency as well as technology, and we wanted a greater share of this market.


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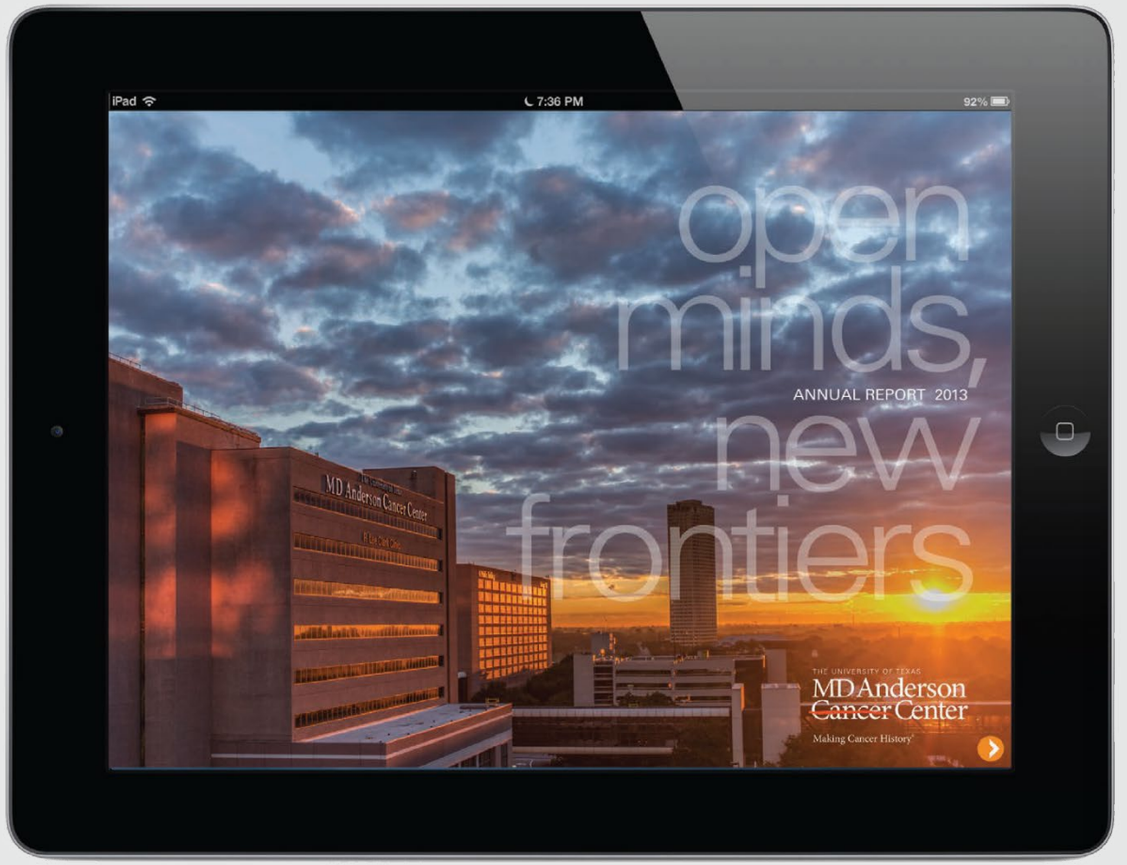
WG Marine A systematic approach
The goal of the WesternGeco Marine transformation is to replicate our 4D market share success in the efficiency-driven 3D market. The Marine offering was viewed as an integrated system, comprising four main pillars: the fleet, efficiency and reliability, technology, and customer alignment.
How fast can you go?
The Fleet
Is the spread reliable?
Spread Integrity
SEISMIC VESSEL
SEISMIC STREAMER
How efficient can you be?
Wide Tow
Customer Alignment
Can there be a win-win?
Technology
What can you measure?



MD ANDERSON CANER CENTER | **iOS Interactive Publications** | Creative Direction, Design: Michael Clarke

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ADDITIONAL SAMPLES AVAILABLE UPON REQUEST

MOTION GRAPHICS

UX/UI WORK

ILLUSTRATION