

Lifelines

● The Better Future Issue

Life Science Catalyst Award Winners

Catalyzing a New Era
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Public Policy

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p. 10

Member Story

Microgravity:
The Next Great
Innovation Platform
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ted.jacobs@cushwake.com
CA License No. 1855220

(858) 452-6500

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Designer & Editor in Chief: Lauren Panetta



Letter from the CEO

Greetings and welcome to our Spring 2021 issue of *LifeLines*. My personal wish is for a healthy start to the year for our 1,400 members of Biocom California across the US, and in Japan. As we continue to work effectively together to defeat the COVID-19 pandemic, I'm overwhelmed by the initiative and success of our members who have developed the tests, treatments and vaccines for the coronavirus. I'm equally proud that we are a part of keeping all of our members working safely through our Path Forward program, our policy engagement, and actions such as providing guidance and much-needed PPE to our companies. Our Biocom California team has worked tirelessly to ensure that we respond quickly and effectively to meet our members' evolving needs—including those whose critical work lies outside the COVID-19 space. With vaccines now deployed and available across the population we look forward to a positive turn in the pandemic this year. In the meantime, as you'll read in the following pages, we've learned much over the last year about how to better serve our members with remote programming and networking initiatives, access to funding and other capital, and supply chain solutions that will allow our companies to function even more efficiently.

As this edition of *LifeLines* is released, we've begun a new chapter in our country's history with President Joe Biden and Vice President Kamala Harris. Biocom California is first and foremost the advocate for our life science industry and we are already beginning to engage in dialogue with the new administration to

ensure that we continue to fight for investment in early stage research and innovation, and for a competitive market for patient access to our products in the US. In the final days of the Trump Administration Biocom California partnered with BIO to file a complaint in federal court challenging an unfair Most Favored Nations drug pricing scheme that would destroy the investment in new drugs by both large and small companies. We are pleased that the court ruled in our favor, and we are hopeful that we can begin new discussions with the Biden Administration to ensure a more equitable system of affordability of drugs for our seniors in the near future. We also look forward to working with our new Secretary of HHS Xavier Becerra and our new US Senator Alex Padilla who both have participated in Biocom California member roundtables in the past and are very familiar with our industry through the work of our state and federal policy teams.

On the important topic of innovation, I know you will enjoy reading about this year's Biocom California Catalyst Award winners. Each year we honor some of the brightest and most innovative company leaders under age 40 who are running life science companies within the state's three vibrant clusters. In addition, you'll find stories about some of the most innovative efforts in which our members are engaged, such as building the first commercial space station for life science research, and developing agricultural products that use natural pheromones to confuse pests. If the US is the heart of life science innovation for the world, I'm sure you'll agree that California is its heartbeat after reading these stories.

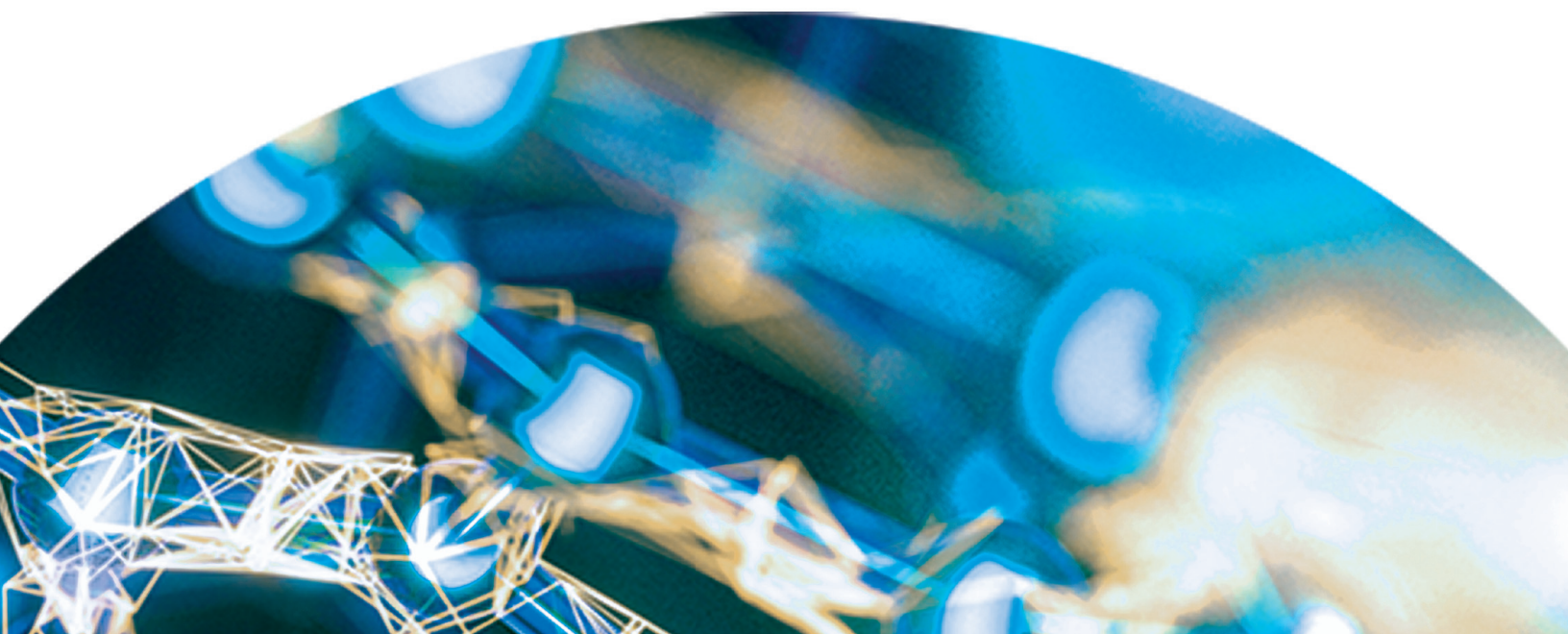
Our 2021 Board of Directors Chair Rich Pascoe, Vice Chair Carin Canale-Theakston and I have made diversity, equity and inclusion the key focus of our leadership efforts this year. We launched our DE&I initiative late in the fall of 2020 and are making tremendous progress in bringing together both industry experts within our membership, and as importantly, in reaching out to the community at large to enter into a wide and inclusive dialogue on this timely topic.

We are committed to creating a more diverse and inclusive workforce in the life sciences, from diversifying the C-suite to providing more opportunity for underrepresented people to enter life science education and careers. I will continue to work closely with our Board Nominating and Governance Committee to attract and recruit new and diverse members to our Boards of Governors and Directors. You'll read more about all of our efforts in this edition.

Finally, welcome to our new name. Late last year, we received approval from the Secretary of State to operate under a new name—Biocom California. We have launched a new strategic plan this year that builds upon our past statewide growth initiatives, including opening offices in the Bay Area and in Los Angeles. This year we will formally launch a new San Diego regional office, separate from our corporate headquarters in San Diego. In doing so, we'll be able to focus more effectively across the five pillars of Biocom California as well as leverage the valuable work of our California Biotechnology Foundation in Sacramento, the Biocom Institute, Generation STEAM and the Biocom Purchasing Group. We will continue to deliver value to our growing membership as we connect and deepen our regional cluster engagement, and expand our statewide impact across the US and the world. As always, we draw our strength and our inspiration from you as we work to accelerate life science success together. Please stay safe and well!



Joe Panetta
President & CEO
Biocom California



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Catalyzing a New Era for Life Science

By Lauren Fish, Senior Content Manager and Science Writer, Canale Communications

Catalyst | cat·a·lyst (noun):
an agent that provokes
or speeds significant
change or action.

For the last five years, Biocom California has recognized the individuals across the Golden State who are sparking significant change in the life science community—all before their 40th birthday. From developing a new kind of wearable chemical biosensor, to creating the next generation of viral therapies, to cultivating California's emerging life science cluster, a new era of medicine has arrived—and these changemakers are the ones ushering in the renaissance. Take a look at how this year's Life Science Catalyst Award recipients are transforming our entire industry (and beyond).



Cameron Turtle, D. Phil.

Chief Business Officer,
Eidos Therapeutics;
SVP, Portfolio Management,
& Corporate Development,
BridgeBio Pharma

A little over five years ago, BridgeBio Pharma was founded to develop new medicines for rare, inherited diseases—and Cameron has been an instrumental part in helping the organization realize this mission. Built on a unique subsidiary model, BridgeBio has already built a pipeline of more than 20 therapies and filed for two FDA approvals. Cameron serves as the chief business officer of subsidiary Eidos Therapeutics, where two Phase 3 studies are currently being run to evaluate a new treatment for a type of progressive and fatal heart failure. “We are finally seeing the output of the human genetics revolution leading to an unprecedented number of precision medicines in development and reaching approval,” he says. “I am incredibly excited to continue seeing these genetic medicines progress through development with higher rates of success, and ultimately becoming part of our armamentarium of highly effective treatments for patients.”



Inanc Ortac, Ph.D.

Co-founder & Chief Scientific
Officer, DevaCell; Founder &
Chief Scientific Officer, Sarmal;
Founder, CEO & Chief Scientific
Officer, Innovasion Labs PINC

With their innate ability to hijack cells, viruses can be engineered to treat an entire spectrum of diseases. However, delivering therapeutic viruses has been a challenge—our immune response typically dampens their effects before they can reach their target tissue. Until now. Based on his doctoral studies at the University of California, San Diego, Inanc co-founded DevaCell to develop genetically engineered viruses that can evade immune system detection until reaching their target of choice—and the applications are endless, spanning cancer immunotherapy, gene therapy and vaccines. With the advent of technologies like this, Inanc believes we are entering the era of personalized medicine, and that this will be the century of biology and biotechnology. “We are at an inflection point that will lead to major advancements improving human health and quality of life,” he says. “We have witnessed ‘the Digital Revolution,’ and now ‘the Bio Revolution,’ is next—and I’m so excited to be a part of it.”



Racquel Bracken

Partner, Venrock

As a partner at Venrock, Racquel plays a pivotal role in uncovering today’s most promising pharmaceutical and biotech investments. Her work also extends to the company creation front—including the organization she co-founded and previously led, Federation Bio, launched with the mission of designing, discovering and developing microbes to improve the human condition. Racquel’s talent for business development and identifying high-potential assets has been consistent throughout her career including at Clovis Oncology, where she played a pivotal role in the approval of a new breakthrough therapy for the treatment of advanced ovarian cancer. Outside of the life science investment realm, you can find her on the slopes: she also happens to be an avid backcountry skier, mountaineer and mountain biker.

**“We are at an
inflection point
that will lead to
major advancements
improving human
health and quality
of life.”**



Wei Gao, Ph.D.

Assistant Professor of Medical Engineering, California Institute of Technology

What if we could non-invasively track biomarker information—through our sweat? That’s exactly the kind of technology that Wei and his team are developing. Their wearable chemical sensor is being designed to continuously track a person’s health state at the molecular level, all through analyzing the perspiration on our skin—a drastic departure from the current commercially available wearable devices that monitor physical parameters, such as vital signs. Wei believes the opportunities that wearable biosensors present for personalized healthcare are enormous. “The information collected by these sensors could provide early diagnosis and enable timely intervention,” he says. Outside of Caltech and the realm of wearable technology, Wei can be found with his family or enjoying one of his favorite pastimes: food, travel, hiking or snorkeling.



Arthur Kuan

Chief Executive Officer, CG Oncology

Oncolytic immunotherapy—using genetically modified viruses to target and kill tumors—has shown tremendous promise in treating even the most advanced cancers. Arthur and his team at CG Oncology are helping usher in a new generation of these therapies, which are being engineered to not only fend off cancerous tissue, but even deter its spread and limit its recurrence. So far, Arthur’s leadership expertise has impacted the company’s clinic success, as CG Oncology is launching a Phase 3 registration study for an oncolytic vaccine targeting tumors that have resisted treatment. Arthur’s business acumen stems from his expertise in the investment sector, having been a founding member of Ally Bridge Group and a previous member of Themes Investment Partners.



Jasson Crockett

Former Director of Community Business & Economic Innovation, Mayor’s Office of Economic Development, City of Los Angeles

Cultivating a prosperous life science ecosystem requires the dedication, exceptional leadership and operational know-how to get the job done. In particular, the Los Angeles biotech community has been rapidly evolving and expanding over the last few years, and Jasson has been at the center of this movement. Having played a critical role in community business, innovation and policy at the Mayor’s Office of Economic Development, Jasson has played a formative role in shaping the region’s scientific and economic prosperity. On behalf of Jasson’s work, this cluster is now becoming known for its groundbreaking incubators, research institutes and even up-and-coming startups. Jasson’s leadership has helped foster a connected, prosperous region where all of these critical components can thrive together.

There is always more to discover, imagine, build, and create.



Sarah Bhagat, Ph.D.

Partner, Sofinnova Investments

Sarah Bhagat is a partner at Sofinnova Investments, where she focuses on identifying the biopharmaceutical investments that show the most promise in shaping patients' lives. She currently sits on the board of multiple companies in the industry, providing invaluable counsel to companies such as Atsena and Inozyme. Her success on the investment arm stems from her deep understanding of the science and years spent in the lab including during her postdoctoral fellowship in neuroscience at Stanford University and completing her Ph.D. at Yale University. Passionate about the neuroscience field, she has played a critical role in identifying novel targets and developing therapeutics for CNS injury and psychiatric disorders through her research, and she currently serves as a board member of Stanford's Neuroscience Translate Oversight Committee.



Katie Planey, Ph.D., MBA

Co-founder & Chief Technology Officer, Mantra Bio

Science is a multi-faceted discipline that, as a result, requires a multi-faceted approach. Realizing this, Katie brings expertise across business strategy and biomedical informatics to address biology's inherent complexity. As the co-founder and Chief Technology Officer of Mantra Bio, Katie is helping harness exosomes—the extracellular vessels that play a critical role in cell-cell communication—to deliver safe, highly targeted medicines to the patients who need them most. Mantra Bio combines computational biology and lab automation to discover first-in-class medicines at never-before-seen-rates, ultimately helping address needs across multiple therapeutic areas. Katie's leadership even extends beyond Mantra Bio: she also plays an active role in mentoring young graduates who are considering a career path in the data science or business fields.

"Across various sectors, regions, disciplines and career paths, these ten trailblazers are united by their passion for improving human health and transforming life science as we know it. This year's Catalyst Award recipients are a testament to the strength of the industry within California—strength that they will continue to foster with the leadership, passion and innovation that the field requires to thrive."

Joe Panetta
President & CEO
Biocom California



Trevor Martin, Ph.D.

Co-founder & Chief Executive Officer, Mammoth Biosciences

As the CEO and co-founder of Mammoth Biosciences, Trevor is leading the charge in building the platform that can read and write the code of life. By leveraging today's CRISPR-Cas technologies, Trevor's team is accomplishing everything from developing a new generation of CRISPR-based diagnostics to creating nano-sized Cas proteins capable of making therapeutic delivery easier. Trevor believes that reprogramming the code of life will enable us to not only diagnose, but even cure intractable diseases—ultimately improving the lives of people across the globe. “I’m excited for biology to continue to become more like engineering and software,” he says, “with reproducible tools and techniques that are modular and allow us to interact with life in ways similar to how we interact with computers today.” While Trevor has spent much of his time in the scientific realm, he also worked as a freelance writer during graduate school, applying statistics to better understand the world around us through data.



Pedro Coelho, Ph.D.

Co-founder & Chief Executive Officer, Provivi

As our population continues to grow and the demands of agriculture become more extreme, we require farming practices that are innovative, sustainable and affordable—all at the same time. This is exactly why Pedro founded Provivi, alongside 2013 Nobel Laureate Dr. Frances Arnold and Peter Meinhold. In applying state-of-the-art technologies to improve farming, Pedro is hoping to protect crops across the globe and consequently transform the world. This includes rethinking the entire insect pest control paradigm by developing pheromones that disrupt mating patterns, and as a result, better manage the insect population. Pedro and his team at Provivi are already delivering on their mission: they recently announced the launch of a mating disruption dispenser for the control of Fall Armyworm in Mexico.



● **Congratulations to Biocom California's Life Science Catalyst Award Winners, a group of ingenious changemakers leading the way in a year filled with uncertainty.**

● Lauren Fish is a CanaleComm Content Manager and Senior Science Writer, combining her dual passions for science and communications to develop thoughtful content for a range of clients in the life science industry.



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Leading on DE&I

By Jimmy Jackson, Senior Vice President and Chief Policy Officer, Biocom California

In the sphere of Diversity, Equity, and Inclusion (DE&I), California has made itself a leader in promoting diversity in corporate board composition. In 2018, California established the first law in the country requiring publicly held companies with a principal executive office in California to have a minimum number of women on their boards. Under the terms of that legislation (SB 826), by December 31, 2021, a company with six or more directors must have a minimum of three female directors, a board with five shall have a minimum of two, and a board with four or fewer shall have at least one female director.

Last September, Governor Gavin Newsom signed AB 979 into law. It took the same company criteria above and mandated that, by December 31, 2021, all must have a minimum of one director from an underrepresented community (an individual who self-identifies as Black, African American, Hispanic, Latino, Asian, Pacific Islander, Native American, Native Hawaiian, or Alaska Native, or who self-identifies as gay, lesbian, bisexual, or transgender). By December 31, 2022, a corporation with at least four but fewer than nine directors would have to have two members from underrepresented communities, and those with nine or more directors would have to have three from underrepresented communities. It is critical to note these requirements are in addition to those enacted by SB 826, although the same person can fulfill the requirements of both laws.

Looking forward, DE&I will undoubtedly be an important part of conversations at the federal, state and local levels, but some of those efforts may be hampered by budget crises at all levels of government due to the continuing impact of the coronavirus crisis. Funding that might have gone to improving STEM programs in schools will likely be used for other purposes as schools try to catch up from what will be a year or more of distance learning for most with vastly differing amounts of resources at their disposal to mitigate issues such as lack of access to quality internet services.

Speaking of looking forward, the new year will present many challenges. In December, Biocom California joined the Biotechnology Innovation Organization and CLSA in filing a complaint in US District Court against the U.S. Department of Health and Human Services' "Most Favored Nation" Interim Final Rule. This rule, scheduled to be effective

January 1, 2021, takes 50 drugs commonly administered in physicians' offices or ambulatory surgery centers and will index drug reimbursement to those providers based on the drugs' prices in other countries. The rule purported to create a seven year "model," or pilot program, with no data on how it might affect patients or providers, and with little to no stakeholder engagement.

Regardless of the outcome of this complaint, accessibility to patients of medications ordered by their providers is likely to be a key issue at both the federal and state levels. Whether it be price indexing that will have a net effect of denying the most appropriate treatments to the sickest patients, or drug importation with its inherent security risks or one-size-fits-all drug "value assessments," the industry's continued ability to deliver innovative and life-saving drugs to patients will be at risk.

This year, the policy department will bring a new level of service to our Bay Area members. We are pleased to announce the hiring of Policy Associate Mitzy De La Peña Medina, who is charged with representing Biocom California with Bay Area regional governments and bringing our regulated professionals together.

There is reason for hope from government. Perhaps at no time in history have more people, policy makers and the general public alike, been more aware of the industry's contributions to society and the economy. It has responded to a global pandemic in record time, reallocating countless resources to this fight. The life science industry has delivered life-saving devices, tests and therapeutics in months. By the time you read this, vaccines are likely to be approved for use in the United States and some of our most vital caregivers will have received them. That battle is not over, but people finally can see a finish line, and see the industry in a whole new light.



● Jimmy Jackson is the Senior Vice President and Chief Policy Officer for Biocom California. He oversees government affairs and public policy for the organization.



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Microgravity:

The Next Great Innovation Platform

By Anjali Gupta, PhD, Life Science Business Development Lead,
In-Space Research & Manufacturing, Axiom Space

“Space is a vast void in which the Earth”, as Carl Sagan said, “is merely a pale blue dot suspended like a mote of dust.”

A near-complete vacuum devoid of any atmosphere, the space environment is unique. Temperatures in Earth’s orbit can soar to +120° C and plunge to -100°C. High-energy atomic particles, stripped of their electrons, zip around at high speeds in the form of ionizing space radiation. Gravity itself becomes a variable.

To orbit the Earth, a spacecraft must travel at 17,500 mph to counter the downward pull of gravity—putting the spacecraft in a state of constant free fall. This creates an environment of weightlessness, also known as “microgravity,” for the objects inside the spacecraft. Objects in free fall do not feel the force of gravity as they do on the surface of the Earth.

Thousands of experiments conducted in Low Earth Orbit (LEO) on the International Space Station (ISS) have unveiled novel insights about biological phenomena in microgravity including:

- **Protein crystal growth:** Understanding the 3D structure of a protein is critical for optimizing pharmaceutical drug design. Protein crystallization is an important first step. The microgravity environment is ideal for reliably growing diffraction-quality protein crystals. Lack of buoyancy-driven convection currents, absence of sedimentation, and slower, more uniform diffusion of molecules into a crystal lattice results in larger and more highly organized crystals compared to those grown on Earth.

- **Accelerated disease modeling:** Microgravity serves to accelerate disease processes in a minimally invasive manner, resulting in physiologically relevant models and shorter timelines for drug discovery.

● **Aging:** On Earth, aging is a time-consuming process that prolongs the generation of age-related disease models. Spaceflight accelerates the aging process to create adaptive yet reversible changes, with phenotypic and genotypic biomarkers of aging.

● **Bone and muscle:** Spaceflight offers a clear advantage for generating osteoporosis and muscle atrophy disease models. Exposure to microgravity eliminates the confounding effects of weight on bone and muscle homeostasis. In both cases, the disease process is accelerated with a 10 to 20x increase in the rate of bone loss within a few days and up to 20% muscle atrophy within a few weeks on orbit.

● **Regenerative medicine:** Recent studies in space hold promise for accelerating stem cell expansion. Microgravity confers a unique advantage for 3D organoid models and 3D bioprinting. In both instances, lack of gravity-driven convection, buoyancy, and sedimentation results in the formation of more complex organic and manufactured 3D structures that are truer to nature.

● **Manufacturing:** Microgravity is advantageous for layer-by-layer deposition manufacturing processes. Protein-based retinal implants manufactured this way in microgravity result in higher quality products. Lack of solution sedimentation in orbit improves implant homogeneity and eliminates irregular protein deposition.

Space is only just emerging as a tool for pharmaceutical drug discovery or biotechnology development. This small sampling of insights and applications developed from in-space research indicates great potential for discovery and innovation.

While twenty years aboard the ISS have laid a foundation for humankind in LEO, the 2020s are ushering in a new era of exploration and expansion in space. Thomas Kuhn writes about this new frontier for innovation in his book *The Structure of Scientific Revolutions*.

Kuhn posits that while “normal science” guided by the scientific method serves as the basis for incremental progress, it is “revolutionary science” that leads to “paradigm shifts.” Such transformative science requires radical ideas and tools. Microgravity is a radical but increasingly accessible tool.

Space is only just emerging as a tool for pharmaceutical drug discovery or biotechnology development.

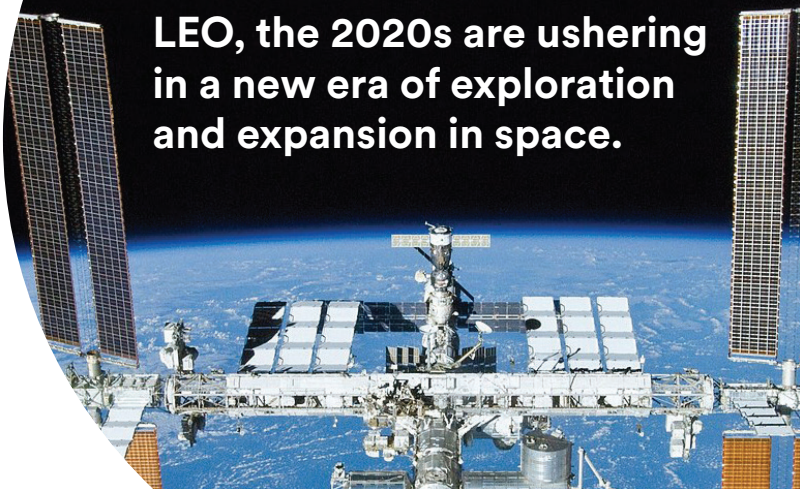
The catalyst for this expansion of accessibility is a move from government-funded to competitive, commercially driven operations in space. Reusable rockets are lowering the cost of spaceflight; automation and large-scale additive manufacturing are enabling novel and unconventional rocket design. Leveraging this maturing commercial launch capability, Axiom Space currently provides access to microgravity on the ISS through commercial research and private astronaut missions.

Beginning in 2024, Axiom will construct the world's first private commercial space station, the *de facto* successor to the ISS, in orbit. This first-of-its-kind space station will lower the barrier of access to space and provide a state-of-the-art innovation platform that leverages microgravity to accelerate the translation of therapeutics from the lab to the patient. Traditional pharmaceutical drug discovery, historically a long and expensive process, is ripe for disruption.



● **Anjali Gupta, PhD** is part of the team at Axiom Space pioneering access to space as a platform for innovation and discovery, with revolutionary implications for life science. Learn more at axiomspace.com.

While twenty years aboard the ISS have laid a foundation for humankind in LEO, the 2020s are ushering in a new era of exploration and expansion in space.



Building a Network of Life Scientists During Exceptional Times

By John M. Newsam, CEO, Tioga Research

and David J. Moore, Director, Scientific Engagement & Business Development, Europe, Tioga Research

When the stay-at-home orders in California and elsewhere were enacted earlier this year, Tioga Research scientists became unable to interact in person with colleagues in the skin research, technology, biology, and product development fields. This constraint, of course, was not unique to Tioga Research, as the cancelling of in-person scientific seminars and conferences similarly impacted many other industrial and academic scientists.

Governor Gavin Newsom ordered the first statewide mandatory restrictions in the US beginning on March 20, 2020. Almost simultaneously, *Science* published a paper by Felipe Garcia Quiroz, Elaine Fuchs and colleagues describing how 'Liquid-liquid phase separation drives skin barrier formation'. Tioga Research is near-exclusively dedicated to formulations for topical (that is, into the skin) and transdermal (through the skin) delivery. Dr. Quiroz's high-visibility paper was of immediate interest. For some years, we had scheduled a monthly brown bag lunch, at which a Tioga Research scientist or intern would present for thirty minutes or so on a science topic. We called Dr. Quiroz to invite him to present to the company team on Zoom. He delivered a magnificent talk. He also appreciated the insightful questions posed by our scientific team. By this simple mechanism we had established a connection that could well lead to interesting future collaboration.

We realized quickly how powerful this low-key approach could be and instituted a weekly series of virtual Topical Science Talks. These showcase impactful recent work in our general domains of interest. For speakers, each of whom might present with little preparation and from their home office, the forum has proven to be a been a convenient and stimulating way to present their work to a small but engaged and interested audience.

Topics addressed to date in the series include aspects of fundamental skin cell biology, 3D bioprinting of skin, formulation discovery, in situ spectroscopy, additive manufacture, molecular simulation, mechanical

measurements, and ex vivo normal and diseased skin models. Speakers have hailed mainly from US academic campuses, but also from institutions in Japan, Korea, Sweden, France, and the UK. We have invited speakers from client and collaborator companies, and from key technology providers, to present recent scientific results.

Through the Topical Science Talks series, Tioga Research scientists have the opportunity to meet and to learn from leading scientific experts, in an intimate context. The company benefits from the exposure to key opinion leaders and from the connections that result. And our speakers realize the immediate perspectives of our experienced research team on their work, and the broader introductions we might make through our global network.

We are deeply appreciative of all our presenters (whether post-doctoral fellows, industry researchers or professors with endowed chairs) who contributed stimulating presentations even while managing their own unusual work situations. The initial push to establish the Topical Science Talks series may have come from the first stay-at-home order, but the broad benefits of the series will ensure that it continues even after the time from which in-person scientific conferences and site visits can resume. If you would like to learn more about the Topical Science Talks series or are interested in contributing, please email us at info@tiogaresearch.com.



● John M. Newsam has been CEO of Tioga Research since launch in 2011. A materials chemist by training, he has authored over 170 scientific publications, on topics such as high throughput experimentation, skin-applied formulations, and materials simulation.



● David J. Moore is based in the UK where he is responsible for scientific engagement and business development activities across Europe and Israel for Tioga Research.

By this simple mechanism we had established a connection that could well lead to interesting future collaboration.

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Accelerating Diversity, Equity and Inclusion in California's Life Science Industry

By Karmin Noar, Executive Director, Biocom Institute

Studies show, in order to remain competitive in today's global economy, diversity is critical as it directly impacts a company's bottom line: diverse companies perform better financially, attract a larger pool of professionals, and have high employee retention rates. However, the life science industry has been slow to embrace this reality. While Black, Indigenous, and People of Color (BIPOC) represent 40% of the US population (Brookings Metropolitan Policy Program), according to a recent BIO Diversity Report, BIPOC make up only 32% of the biotech workforce and a mere 15% of biotech executive teams.

In December 2020, Biocom Institute launched its first biennial report, "Diversity, Equity and Inclusion in California's Life Science Industry," to share the state of Diversity, Equity, and Inclusion (DE&I) across life science companies in California. The report includes responses from 335 organizations in the California life science industry gathered from August to September 2020, and it also represents each of the five main subsectors of the industry (biopharmaceutical manufacturing, research & lab services, medical devices & diagnostic equipment, life science wholesale, and biorenewables). Notably, 61% of respondents reported that they worked at organizations with fewer than 50 employees, and 28% of respondents hailed from companies with fewer than ten employees. The majority of respondents were interested in engaging in and promoting DE&I initiatives in life science; however, the data suggests that most companies simply may not have the resources to do so.

We must be more intentional by going beyond simply creating diversity, but sustaining diversity by creating inclusive, supportive environments.

To this point, key takeaways from the report include:

- 9% of respondents indicated that companies officially recognize DE&I in their mission and vision statements, while 13% reported that their companies publicly publish diversity goals.
- 14% of respondents reported that their company has a DE&I strategic plan.
- 12% of respondents stated that their company created or is creating a DE&I-specific office, team or position.
- 71% of respondents shared that their companies do not have internships, mentorships, apprenticeships or similar programs for students from communities traditionally underrepresented in STEM.

Biocom Institute is committed to establishing programs that ensure California life science organizations have the tools needed for their DE&I initiatives, as well as provide an actionable DE&I implementation plan for life science companies of all sizes. We plan to work with firms directly to advance and promote a diversified life science workforce through resources, programs and professional development.

Why does this matter? The life science industry in California is rapidly growing. In order to continue and sustain this growth, the industry needs a talented, trained, diverse, and educated workforce. At Biocom Institute, we believe that talent is our industry's greatest competitive advantage. In 2020, the COVID-19 pandemic highlighted the deep inequities that persist disproportionately in communities of color. Coupled with the ensuing economic crisis, the pandemic has put a renewed and urgent emphasis on the importance of racial justice and accelerating and promoting diversity, equity, and inclusion in the life science industry. For the industry to continue its growth, success, and to solidify its role as an engine for social and economic good, diversity, equity, and inclusion cannot be just another initiative. We must be more intentional by going beyond simply creating diversity, but sustaining diversity by fostering inclusive, supportive environments.

Now more than ever it is critical for us to partner with industry, government, education and others to develop talent pipelines that serve the industry and the people of California. We're pleased to hold a position to bring these stakeholders together, and we stand by our commitment to develop and promote a skilled and diverse workforce in the life science industry. We know we can grow diverse talent pipelines so that young students, professionals, and experienced professionals all remain and can thrive in California's life science industry.

Through intentionality, hard work, and accountability, we can collectively advance a welcoming and thriving life science industry that recognizes the value of individuals with diverse backgrounds, talents, experiences and perspectives.

Biocom Institute has identified the following priorities to advance and promote a diversified life science workforce:

- Create more pathways for people traditionally underrepresented in STEM fields, so that they are exposed to the possibilities of careers in life science.
- Support and strengthen the teacher workforce to inspire and educate the future generation of life science leader, innovators, and scientists.
- Support the training, hiring, retention and advancement of more people of color including Black and Latinx workers in life science.
- Identify and amplify promising strategies that build, attract and retain a more diverse, equitable, and sustainable life science workforce.

For more information on Biocom Institute's DE&I data, programs and initiatives, please visit www.biocominstitute.org.



● Karmin Noar oversees strategies, programs and staff of the Biocom Institute and drives initiatives focused on STEM education and workforce development.

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My Green Lab and the Future of Sustainable Science

By James Connelly, Chief Executive Officer, My Green Lab

Right now, the entire world is witnessing the power of scientific research as teams around the globe race to design effective COVID-19 vaccines at mind-bending speed. It has been a monumental effort, but in many ways the work has just begun. Transporting, storing and distributing the vaccine is another massive challenge: it is estimated that the cold chain alone could be 80% of the cost of delivery of the COVID-19 vaccines.

The specialized ultra-low temperature (ULT) freezers necessary for two of the leading vaccine candidates come with an outsized environmental impact. A single ULT freezer needed to keep the vaccines at -70° F can use as much energy as a typical American home. Manufacturers are now ramping up production of these freezers to meet demand, which will have a long-term environmental impact.

This is just one example of the environmental impact of science itself. Science changes the world, but we rarely think deeply about the impact we have while creating that change.

Simply put, research labs are massively resource intensive spaces. Labs use ten times more energy than typical office spaces, and four times more water than typical office spaces. Research labs also produce a stunning 12 billion pounds of plastic waste each year. Overall, biopharma generates 55% more emissions than the automotive industry.

Scientific research must be part of the climate change solution. But the scientific community must also do more than that: we must lead by example. My Green Lab's mission is to create a culture of sustainability through science. As our name suggests, My Green Lab collaborates with scientists and labs around the world to bring awareness and inspire the necessary changes to improve research practices and transform the industry.

At My Green Lab, we offer a number of programs and certifications for labs that want to instill a culture of sustainability within academia, research institutions, life science, and even food and industrial labs. Our Green Lab Certification sets the global standard for environmentally friendly lab practices. The list of participants is rapidly growing, and spans pharmaceutical companies like AstraZeneca, campuses like Johns Hopkins University, and biotech startups like Codexis. We also have a Green Lab Ambassador program that numbers over 265 scientists and lab professionals all around the world that are working to inspire green labs in their school, their work, and their community.

We also recognized early on that in order to have a Green Lab, you must also be able to source and purchase sustainable laboratory products, so My Green Lab has been working to improve the standards of laboratory products and empower scientists and procurement agents to make better purchasing decisions. In fact, My Green Lab worked with the EPA to develop the first Energy Star Certification for ULT freezers that are ubiquitous in research and healthcare environments, and necessary for many of the lifesaving COVID-19 vaccine candidates.



Science changes the world, but we rarely think deeply about the impact we have while creating that change.






Through My Green Lab's ACT Label, the first of its kind Eco-Label for laboratory products, we encourage manufacturers to improve their products while enabling the sustainable laboratory procurement. ACT stands for Accountability, Consistency, and Transparency and provides an independent third-party verification of the environmental impact of lab products including equipment, chemicals and reagents, and consumables. There are now over 500 ACT Label products on our database and the list is growing quickly.

I have always believed that sustainability and social equity are inexorably intertwined, and that every organization and industry must address these issues at the same time we address environmental concerns. In my previous role, I helped create a tool to encourage companies to evaluate and improve equity within their organization called JUST, the first social equity transparency label for organizations. This program was created for the building industry but is just as applicable in life science.

What makes JUST such a powerful tool is like Green Lab Certification and the ACT Label it asks organizations to look internally and benchmark themselves against best practices around equity.

As the spotlight is now shining on our industry and we are showing the best of what science has to offer, we must at the same time rise to the occasion and lead on the critical social and environmental issues of our time. Together we can fundamentally and permanently transform the industry, measurably improve people's lives, and ensure science sets an example for the world. I hope you'll join us.

 ACT. The Environmental Impact Factor Label	
Product Name:	
Manufacturing Location:	
Environmental Impact Scale 	
Manufacturing	
Manufacturing Impact Reduction	7.0
Renewable Energy Use	No
Responsible Chemical Management	10.0
Shipping Impact	7.0
Product Content	4.3
Packaging Content	5.7
User Impact	
Energy Consumption (kWh/day)	6.0
Water Consumption (gallons/day)	11.0
Product Lifetime	2.0
End of Life	
Packaging	8.5
Product	9.0
Environmental Impact Factor 53.5	
Label Valid Through October 2020	
my green lab.  mygreenlab.org	

these values are graded on a scale of 1-10, with 1 indicating the least environmental impact and 10 indicating the highest environmental impact

this category is either yes or no

these values represent actual daily consumption and apply only to equipment

a lower number indicates a lower overall environmental impact

detailed scoring explanations for each category are outlined in the verification guide

The sum total of all values equals the Environmental Impact Factor

ACT labels are valid for two years from the date of issue

My Green Lab's ACT label is being used by scientists, sustainability directors, and procurement specialists around the world. By using ACT the environmental impact of laboratories can be reduced as we work towards sustainability.



● James Connelly is the CEO of My Green Lab, a non-profit organization dedicated to improving the sustainability of scientific research. Learn more at MyGreenLab.org.

Building a Brighter Future Through Biotechnology

By Michelle Nemits, Executive Director, Biocom Bay Area Office

As we look back on 2020, a year that took far too many lives, wrecked countless families, upended education for our youth and battered large segments of the economy, I am proud of the work of so many of our member companies who went beyond anyone's expectations to address the most demanding needs of humanity. The life science industry was a bright spot in an otherwise 'annus horribilis', rising to meet challenges like never before. Our generous members provided PPE and other critical equipment, and developed innovative solutions to COVID-19 in record time. Our industry is also building and delivering the -800°C freezers and shippers needed to move and store the vaccines. Our strategic partners Thermo Fisher Scientific and FedEx are playing critical roles in providing the infrastructure to support vaccine delivery.

This pandemic has shown us that when we come together with a whole-of-industry sense of purpose and urgency, we can accomplish anything. Building on years of prior research, multiple diagnostics, therapeutics and vaccines were developed rapidly and have been proven to be at least 90% effective at preventing the deadly coronavirus. If we focus this kind of intense energy on other diseases, imagine what we can accomplish in the future.

While the pandemic is not over, we are finally turning a corner and able to start looking ahead. This is an enormous tragedy to be sure, but there are a few silver linings that have come out of our collective experience. Paradoxically, even though we have been encouraged to stay in our homes, the adoption of technologies allowed us to stay connected and, in some ways, interact more closely than before. Zoom video calls became the norm when in the past a phone call would have sufficed. Our Biocom California community stayed more connected than ever before through virtual events with participation from all regions of the state on a wide range of topics, with breakout rooms that enabled networking and substantive roundtable conversations. These are trends I hope to see continue as we move toward a 'new normal.'

Video conferencing also enabled telemedicine to rapidly come to the forefront as in-person doctor visits were restricted. I personally participated in virtual doctor visits with my daughters, and even one virtual dentist visit! Biocom California's Tech+Biotech+Medtech initiative, which brings together leaders from the three industries to accelerate the

future of healthcare, dove into this topic in a two-part webinar series last December and it's clear that telemedicine will continue to be a vehicle for healthcare delivery into the future.

There were other bright spots in 2020. Dr. Jennifer Doudna was awarded The Nobel Prize for Chemistry for her work with Dr. Emmanuelle Charpentier on CRISPR-Cas9. Dr. Doudna continues to be instrumental in advancing the commercialization of the technology and is involved in several Bay Area CRISPR-focused startups including Mammoth Biosciences. The company set its sights on COVID-19 early on and is now scaling a CRISPR-based rapid and inexpensive diagnostic for SARS-Cov-2.

Advances in food and agriculture bioscience have remained strong and companies in the space are addressing some of the globe's biggest challenges. Biocom California has a rapidly emerging class of members engaged in these technologies and we recently formed a Food and Ag Tech Committee to bring them closer together to share best practices, navigate regulatory issues and accelerate commercialization of these sustainable solutions. I'm deeply inspired by these members developing creative solutions to tackle major global challenges.

The Biden-Harris Administration takes the reins this month and has an astounding number of challenges to address. Speed is of the utmost importance as people are still dying from COVID-19, the economy has been undergoing a massive shock and our country is dangerously divided. They face unprecedented challenges—let's wish them every success as they attempt to 'right the ship.'

In spite of the grim situation, you—the life science industry in all its facets—have delivered real solutions to help get our country and the world back to some sense of normalcy. You have not only delivered science, you have also delivered hope. I am very hopeful for the future and it is my honor to serve you. Godspeed.



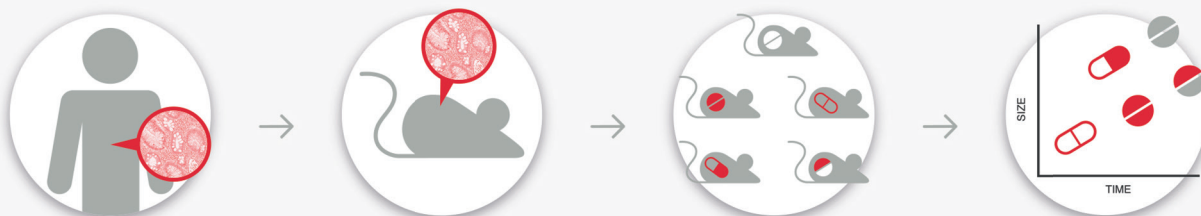
● Michelle Nemits is responsible for building the framework for enabling the creation of a strong, well-connected life science community in the Bay Area.



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Q&A with the UK Government Life Science Representatives in California

The UK's Department for International Trade (DIT) is the UK Government's economic development organization, which helps companies access the UK market and navigate the process of operating successfully within the market. As you pursue commercial opportunities, as well as R&D, clinical development and manufacturing, consider DIT as a bridge for accessing the UK's vibrant life science ecosystem.

Q: How do you support life science companies and how can Biocom California members, especially those interested in expanding globally, best engage with DIT?

Harrison: We support companies by facilitating connections to the National Health Service (NHS), Medicine and Healthcare Products Regulatory Agency (MHRA), Clinical Research Networks, National Institute for Health & Care Excellence (NICE), UK Department of Health & Social Care (DHSC), and life science experts. We also tap into our local connections for grants, office/lab space, skilled talent, and other business needs. We host networking events that unite life science professionals from the UK and throughout California. Our team is located in major cities around the US, with our California team split between San Francisco, Los Angeles and San Diego. We work with companies of all sizes and stages who are looking for guidance on their UK strategy and tangible connections to move the needle forward on investment decisions.

Q: What are the major strengths of the UK's life science ecosystem?

Harrison: Similar to San Diego, the UK boasts an excellent research base, is a global hub for genomics, excels at drug discovery and development and has a vibrant medical technology and digital health ecosystem. The "Golden Triangle" of London, Cambridge & Oxford amounts to a world-renowned biomedical cluster. Companies can access top talent, access biomedical discoveries for licensing and leverage academic-industry collaborations to accelerate translation and get into the clinic faster. The NHS is a global leader in clinical research and is readily accessible to validate your technology in clinical practice.



Harrison Shapira (on right), hosting a biotech executives networking reception with former NICE Chairman, Sir Michael Rawlins.



BreAnne Buehl speaking at Windsor Castle for the Windsor Debates.

Q: With the UK now fully separate from the EU, what key issues do California-based life science companies need to consider?

Bre: There are ongoing regulatory developments, so the MHRA website is always the best resource for official up-to-date guidance. Several companies have asked whether the CE Mark will continue to be recognized, and the answer is yes, but only until 2023. A newly introduced UK CA mark will be required for goods entering the market in England, Scotland and Wales, and the UKNI mark will be required for Northern Ireland. For companies working within digital health and health tech, we suggest keeping an eye on the international data transfer requirements. Please contact us if you need further clarity on MHRA guidance.

Q: Can you share examples of strong links between the California and UK life science ecosystems?

Harrison: Many California companies have recognised the value of the UK ecosystem and have set up operations there. Amgen, Illumina, ResMed, Dexcom, iRhythm, Gilead, BioMarin, and Heartflow have all benefited from the UK's unique ecosystem. Likewise, numerous UK companies are participating in the rich California ecosystem, particularly in San Diego and the San Francisco Bay Area. GW Pharma established their US HQ in Carlsbad; Abzena has a major GMP manufacturing operation in San Diego, and 11Health has a US HQ in Irvine. In Northern California, you will find UK companies such as Kheiron Medical, Oxford Nanopore Technologies, and Huma (previously Medopad). We also have countless collaborations between leading academic and research institutions.

Q: Are there any real-time UK opportunities that Biocom California members can access?

Bre: We have several ongoing calls-to-action and “Grand Challenges” in the UK that are open to international participation. Many are related to COVID-19, while others are related to genomics, healthy aging, AI in health and medicine, and early detection of disease. Our monthly newsletter, *The Tube*, identifies these real-time opportunities. The pandemic has created a demand for genomic innovation and progress. The University of Edinburgh, as part of the GenOMICC consortium and Genomics England, is sequencing 35,000 genomes to understand why some individuals suffer severe COVID-19 symptoms while others have mild symptoms.

The UK established its leadership in genomics by sequencing 500,000 whole genomes through the NHS Genomic Medicine Service, and being the first national healthcare system to offer whole genome sequencing as part of routine care. The ambition is to analyze five million genomes in total in the UK by 2024. Recently, the UK released Genome UK: the future of healthcare, a new strategy to extend the UK's leadership in genomic healthcare and research. Genome UK will fuel even more projects in personalized medicine, prevention and research by harnessing the potential of advanced genome sequencing. Contact us to explore ways to partner or participate.



● Harrison Shapira covers Southern California, supporting the life science sector by opening doors, providing expert guidance and connections to policy and decision makers in the UK.



● BreAnne Buehl supports Northern California medical device, biotech, pharma, and digital health companies via market access guidance, network growth, and focused policy support.

Explore opportunities in the UK by connecting with Harrison or BreAnne

Email: Harrison.Shapira@mobile.trade.gov.uk
BreAnne.Buehl@mobile.trade.gov.uk

LinkedIn: [linkedin.com/in/harrisonshapira/](https://www.linkedin.com/in/harrisonshapira/)
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The Emerging Face(s) of Life Science in LA

By Stephanie Hsieh, Executive Director, Biocom Los Angeles Office

I love this issue's theme of "Building a brighter future" because it dovetails so perfectly with what I have been predicting for LA and my vision of LA's bright life science future. At the Biocom California/LAEDC "State of the Industry" event last October, I declared that, if all of our industry stakeholders play our cards right, LA will not only become a premier, global, life science hub, but a model for life science hubs of the future. That's my vision for our region and it is THE reason why I'm here at Biocom in Los Angeles at this time. How better to combine my passions for the industry, LA, and building big, complex things?!

As of the writing of this, I've been at the helm of Biocom's Los Angeles office for just over three months. Many of my hypotheses about LA—what's here, what's emerging, where our greatest growth potential is, what our points of differentiation will be—can be—has been validated but are just beginning to take shape. We see it reflected in this year's Life Science Catalyst Awardees as a group. They are a great glimpse into, what I believe will be, our very bright future.

Strategically located in East LA near USC Health, Cal State LA, and Grifols, the design-forward HATCH labs facility helps recruit and retain top talent.

We will challenge how life science is viewed, continuing the legacy of innovative thinking and creativity.

For the first time in its history, Biocom California's Life Science Catalyst Awards were judged on a statewide basis (versus region-by-region). Awardees from the Greater LA area represent 40% of the winners—in and of itself, a proud moment for Angelenos! Take a closer look and another pattern emerges: our winners represent a great cross-section of diversity, not only in demographic and technologies, but also across Biocom California's five pillars.

From the perspective of diversity of subsector or technology, we are witnessing a technology convergence in LA. It seems



inevitable to me given the region's great legacy in other industries such as aerospace and, of course, Hollywood. It's only a matter of time before we witness that convergence become an explosion, yielding new fields, innovations and subsegments of the industry from the intersection of our engineering, AI, and digital media expertise with life sciences. I believe we will change how the world thinks about life science and, again, evidence of the start of this transformation can be found in this year's local Catalyst winners. While, our traditional view of early (oncology) drug development remains and is represented by Arthur Kuan and all he's accomplished in his career and at the helm of CG Oncology; we also see the rich engineering legacy of our region reflected in Wei Gao's research and innovations, at Caltech, in wearables and remote monitoring of various metabolites. Further downstream, we see our more traditional view of life science challenged by Provivi and the direction that Pedro Coelho has taken his discoveries, blazing trails in the exciting new ag tech space through his development and commercialization of pheromones for sustainable pest control.

Back to why I'm here at Biocom Los Angeles: LA is at a tipping point. The pieces of the puzzle are falling into place: innovation and technology (which we always had), anchor tenants to keep things sticky, institutional investors with a focus and track record of investing in life science, infrastructure, experienced talent and the support of elected officials.

Biocom California's mission is to accelerate life science. Part of how we do that is to amplify our members' voices—and in LA, show the state and the world what we here in LA already know—there's something brewing in this vibrant city! Moreover, we will challenge how life science is viewed, continuing the legacy of innovative thinking and creativity. But there's still plenty of work to be



Alexandria Real Estate Equities' new life science space for early-stage companies in Thousand Oaks houses several of Westlake Village BioPartners' incubator companies to catalyze growth.

done and a number of challenges ahead. We need to build on our momentum, continue to coordinate all stakeholders to ensure harmonized, targeted and concentrated efforts—in infrastructure, continued investment and deal flow, and workforce development. Biocom Los Angeles is here to make that happen and pave the way for creation of not only a premier, global hub, but a model for future hubs. Watch out world, LA is on the rise!



● Stephanie Hsieh's focus is on transforming the greater Los Angeles area into a premier life science hub, devising and executing on impactful strategies and initiatives for ensuring growth and sustainability.

Introducing LA's First Industry-Valued Bioscience Technician Credential

By Willie Zuniga, President, Grifols Biologicals

The Los Angeles region's life science industry is booming. The industry is a key driver of economic growth and innovation employing people in five sectors: biopharmaceuticals, biorenewables, life sciences wholesale, medical devices & diagnostics, and research & lab services. With established biotech regions like the San Francisco Bay Area and San Diego, as well as emerging hotspots like Los Angeles, California accounts for \$372 billion in economic activity and provides over 1.4 million jobs. With that growth comes an increased demand for qualified entry-level biotechnology, biomanufacturing, and lab technicians who are ready to work and succeed.

Even with a wide range of quality educational programs in bioscience and biotechnology, employers still struggle to find and retain qualified entry-level technicians who understand the needs of the position. The Biocom Institute Technician Credential (BIOTC) meets this challenge.

The region's first industry-approved credential has been developed through a unique collaboration between LA-based educators, business leaders, workforce development partners, and industry advocates and is a direct response to the life science industry's growing labor demands. As employers, we're looking not only for candidates who have core industry knowledge, but who show passion and drive for the life science field. This credential demonstrates both.

Awarded to graduates of bioscience/biotechnology programs who demonstrate proficiency across a range of standardized, industry-defined core competencies, the credential delivers competitive benefits to employers and the candidates they hire.

By simplifying and enhancing the hiring process, the BIOTC provides the following benefits to employers:

- Access to a centralized pool of qualified, viable candidates who are ready to work.
- Candidates who have demonstrated knowledge across core competencies.
- Faster, streamlined on-boarding and training for new hires who understand the job requirements.
- Lower turnover as well as costs associated with hiring and retraining new staff.
- Greater retention among engaged employees committed to their work.

Graduates who earn the BIOTC are prepared for success in their chosen career path with:

- Exposure to leading bioscience and biotechnology companies that are actively hiring.
- Pathways to high-growth careers with the region's most dynamic industry innovators.
- Access to no-cost work-readiness resources and career services through the Biocom Institute Career Lab and Verdugo Jobs Center.
- An industry-recognized credential that differentiates the candidate among other job applicants.

Evaluating Core Competencies

The BIOTC is presented to graduate students who complete and pass an exhaustive assessment exam. This no-cost, two-hour remote exam includes questions covering a broad range of fundamental knowledge and competencies identified by life science employers and educators. Students who achieve a passing score are also issued a digital credential badge for inclusion on resumes, CVs, and other platforms.

A Unique Private/Public Partnership

The BIOTC is the culmination of 10 years of collaboration between these public and private sector partners: Grifols Biologicals, Biocom Institute, Verdugo Workforce Development Board, Verdugo Jobs Center, Los Angeles Valley College, Los Angeles Mission College, and Glendale Community College.

Shaped by Industry Advisors

The first regional credential driven by industry demand, The BIOTC reflects the direct input of LA's leading bioscience and biotechnology employers, including: Amgen, Gilead Sciences, Neutrogena, Kite, Prolacta, and Takeda. As companies are demonstrating an increased commitment to diversifying their workforce, we invite you to recognize the BIOTC and hire trained and skilled community college students.



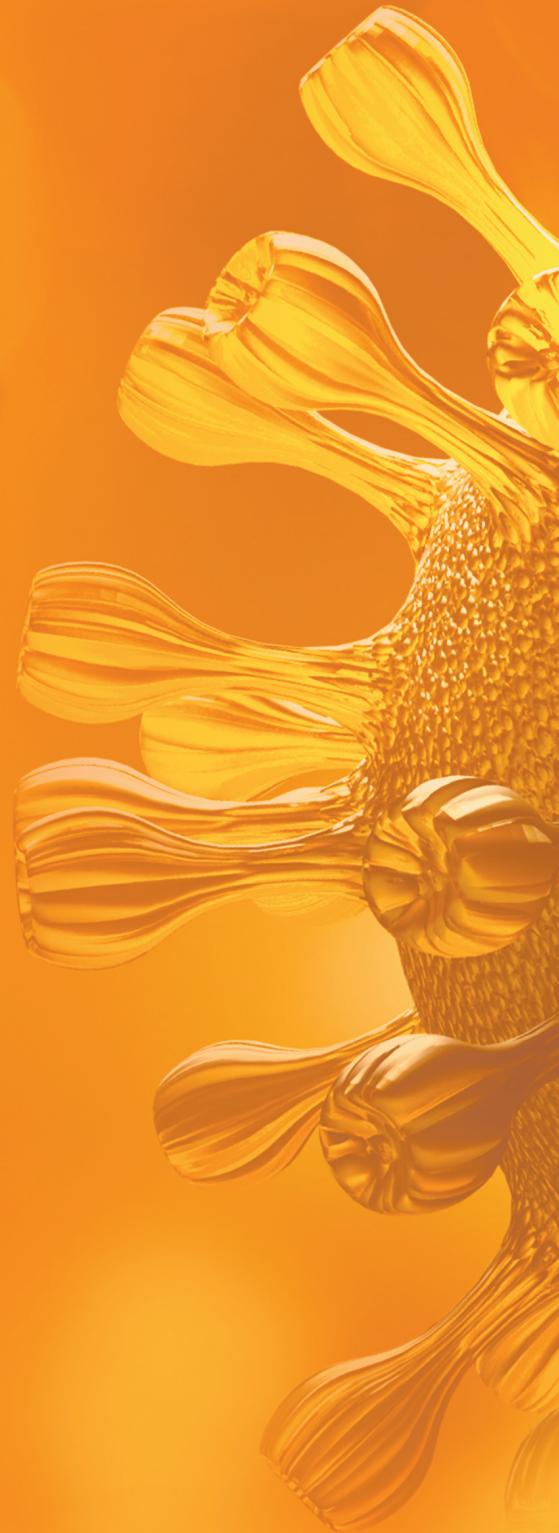
● Since 2003, Willie Zuniga has been the President of Grifols Biologicals, a manufacturer of biological products derived from human plasma that are used as lifesaving therapies.

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Using Some of the Newest Chemistry to Solve One of Our Oldest Problems

By Pedro Coelho, Ph.D., CEO & Co-Founder, Provivi

As a life-long student of chemistry, I was fascinated to learn about how complex it is to sustainably manage agricultural pests. Of course, this is a topic that has captured human imagination since our first days of farming. It is a problem that is simple to describe but difficult to solve. Pests modulate crop yields, can propagate in often unpredictable ways, and if left unchecked can compromise the livelihoods of farmers and those who depend on them, which consequently, affects all of us.

This challenge is difficult to solve because one has to interfere with the pest and the pest only while preserving biodiversity (remember DDT?) and being mindful of loss of efficacy over time due to resistance (insects evolve much like bacteria evolve against antibiotics). Add to that the desire from consumers to not have any harmful residue on the crop and you have the ingredients that make up this challenge: selectivity, durability and non-toxicity.

At Provivi, we are using some of the newest chemistry there is to tackle this problem by producing insect pheromones. These are the natural product messenger signals that Nature has evolved to mediate mating amongst members of the same species. Pheromones were already theorized as a potential solution for pest control in the late nineteenth century. Rachel Carson recognized their promise in *The Silent Spring*, and a brilliant generation of entomologists and agronomists have deployed them over the last thirty years in high-value fruits including apples and grapes. Their benefits with respect to insecticide mitigation and preservation of beneficial insects, bees and ladybugs for example, are well documented in the scientific literature.



Growers use Provivi-FAWTM in a corn field in Sinaloa, Mexico.

Inspired by Nature, we are using the biosynthesis methods pioneered by Frances Arnold, Provivi co-founder and 2018 Nobel Prize recipient, and the latest advances in catalysis pioneered by Bob Grubbs and Dick Schrock, 2005 Nobel Prize recipients, to mass-produce, for the first time, the key pheromones of the pests that threaten corn, rice and soy—the staples of agriculture. These three crops comprise nearly 40% of our global caloric intake and play other roles in our economy, for example, as a source of animal feed, biofuels, and biopower.

The fall armyworm (FAW) is now the single most important pest of corn globally. It is the major concern of farmers from Mexico to Argentina, from Egypt to South Africa, and from India to China. Unfortunately, this pest is already very well adapted to corn being able to feed from the crop during the entire season (young leaves, whorls, tassel, silks and ears). Even in its native environments, such as Brazil, there were already growing signs of a lack of adequate control resulting in economic damage in the adjacent crops of soy and cotton. In the invasive territories, farmer response has been dramatic—some even went to the extreme of burning their crops in an attempt to halt its spread. Since average yield losses are estimated to be 20–40% by institutions such as the Centre for Agriculture and Bioscience (CABI) and the Food and Agriculture Organization (FAO), this pest alone can mean the difference between making some money or no money at all from a harvest. Farmers are therefore hungry for new approaches.

After four years of field trials, we recently launched our Provivi-FAWTM product in Mexico. When we decided to work on a mating disruption solution for this pest, we faced the dual risk of scaling a new technology for a product with yet unproven efficacy. It is thus reassuring to hear farmers describe in their own words the value creation they are seeing in the field: ‘the product works!’. We are excited by the feedback we are receiving from our growers in Mexico and look forward to taking this product to South America, Africa, and Asia.



● Pedro Coelho, Ph.D. co-founded Provivi in 2013 to create scalable, pheromone-based insect control solutions that will improve quality of life and the health of our environment. He is also a Life Science Catalyst Award winner.

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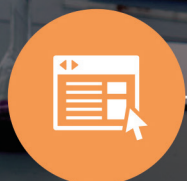
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¹Among all US physicians, DRG Taking the Pulse®, 2020

²Medscape and FDA Fluoroquinolone Study, 2018



TO LEARN MORE, PLEASE CONTACT DOUG KAUFMAN, GROUP VICE PRESIDENT,
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Strategic Sourcing Solutions Shaped by Diverse Industry Experiences

By Rick Fultz, Senior Vice President and Chief Business Officer, Biocom California

With 1,400 member companies in the Biocom California network, representing over 500,000 employees across the state and around the world, one of Biocom Purchasing Group's greatest responsibilities is to ensure a diverse mix of discounted products and service offerings advised by staff and a Board of Directors with even more diverse industry experiences.

We are, after all, representing the life science industry—one of the largest and most powerful forces for advancing humanity.

Biodiversity | bi-o-di-ver-si-ty
(noun): the variety and variability of life on Earth, in all its forms.

Much like the industry we represent, we show up every day with the mission to accelerate life science success for our members. We do our best to keep pace with the transformations happening every day in our backyard. We're growing as a network and as an organization, and we're looking to recruit people from all walks of life to help us embrace a wide range of solutions and voices as we build out a savings portfolio best suited for the diverse member base we serve.

Since the formation of the Biocom Purchasing Group in 1998, we knew we needed to recruit an advisory Board of Directors that would help to inform our priorities, areas of growth, and the unique terms and conditions our members needed most. From the start, we filled the boardroom with men and women from life science powerhouses, big and small, as well as business leaders who know how to negotiate complex deals.

And in recent years, as Biocom California made the decision to expand our operations up the coast to Los Angeles and the Bay Area, we've set out with intention to fill open board seats with talented leaders with diverse backgrounds and experience in order to expand the vision and discussions happening around the table.

We are extremely proud to introduce you to our newest Biocom Purchasing Group Board of Directors:



Cheri Curry
Bay Area

Cheri is Senior Director of Global Procurement & Facilities Operations at GRAIL Inc. in Menlo Park, CA—a biotechnology company focusing on combining science, technology and clinical

studies to reveal early-stage cancers. Cheri has worked as a procurement professional in the life sciences industry since 1998 for global biotechnology and pharmaceutical organizations as well as at an international biomedical research center and we are extremely lucky to benefit from her worldly experiences. Cheri also serves on Biocom's Board Level DE&I committee.



June Lombardi
San Diego

June is an experienced senior procurement professional across multiple disciplines including semi-conductor, healthcare, biotechnology and most recently for the not-for-profit biomedical research institute, Scripps Research.

June's eProcurement strategies and initiatives at Scripps were recognized by Bio-IT World's Best Practices Award in 2010 and while at Genentech, she developed a robust Supplier Diversity program that we're learning from even today.



Bill Coakley
Bay Area

Bill recently retired from BioMarin Pharmaceuticals as Sr. Director, Global Supply Chain Planning, where he was responsible for global commercial and clinical planning, S&OP, and Clinical

Supply Chain. He has over

30 years of executive supply chain experience, managing Purchasing and Strategic Sourcing for such companies as Genzyme, Quest Diagnostics, Rexall Sundown and several other biopharmaceutical and life science companies that make him such a relevant advisor for our membership today.

The Biocom California community is supportive, inspiring, and successful because of its diversity of ideas.

Our evolving Board of Directors has had a significant impact on the direction of our organization, stressing growth and evolution into new product categories and new paths to securing supplier partnerships.



Bruce Mayberry
Chairman of the Board,
Central San Diego Black
Chamber of Commerce and
Senior Diverse Enterprise
Advisor, SDG&E

Most recently, we have formed an alliance with the Central San Diego Black Chamber of Commerce, under the direction of Bruce Mayberry, Chairman of the Board and SDG&E's Senior Diverse Enterprise Advisor.

The Central San Diego Black Chamber of Commerce utilizes innovative programs, networking opportunities, and business partnerships to advance and strengthen Inclusive Economic Development throughout the City and County of San Diego, and we are excited for this opportunity to source more diverse supplier programs on behalf of our members.

We are also committed to seeking out even more certified women-owned small businesses like our endorsed partner of workplace design, Cultura—who was named the #1 Best Place to Work in the small employer category (15–49 employees) by the *San Diego Business Journal's* Best Places to Work, beating over 79,000 small companies in San Diego. They were also listed as the fifth largest Women-Owned Small Business in San Diego by the same publication.

We are honored to learn and grow from partners like the Central San Diego Black Chamber of Commerce and Cultura who remind us that the Biocom California community is supportive, inspiring, and successful because of its diversity of ideas. Our goal is to build a cost savings structure for our members ranging in size from post-incubator all the way up to big pharma, accelerating member vitality from San Diego up to LA and the Bay and we believe a key part of achieving that goal will be leaning in on diversity.

We look forward to delivering savings programs that are even more representative of our diverse member base who benefit from the drugs, therapeutics and discoveries coming out of our great state. When the life science industry benefits from DE&I, we all benefit. And while we've done our best to ensure an inclusive savings portfolio advised by a diverse panel of experts over the past 25 years, we are doing it now more than ever with intention for a brighter future ahead.



● Rick leads Biocom California's membership, sponsorship and revenue efforts, growth and partnering initiatives, and overall business development strategies.

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* New Members from August 2020–February 2021

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Echelon Diagnostics	Genome Medical	Inovio Pharmaceuticals	Locanabio	Nanosonics
Eclipse BioInnovations	Genopis	InscoPIX	Lucence Health	NantWorks
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eFFECTOR Therapeutics	GenVivo	Intabio	Lumiseek	Navega Therapeutics
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 Biopharmaceuticals
 Tioga Research
 Toxikon
 Translational Drug
 Development (TD2)
 Triligent International
 Trumab
 Virapur
 Viva Biotech (Shanghai)
 Limited

VO-CRO (Vanderbilt
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 Wax-It Histology Services
 Zyagen

CMOs

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 WuXi Biologicals

MEDICAL DEVICE & DIAGNOSTIC

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 Accunome Sciences
 Acutus Medical
 Adagio Medical
 Adigica Health
 Advanced Motion
 Controls*
 Aethlon Medical

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 Alpha-Tec Systems
 AltheaDx
 Amprion
 Amydis Diagnostics
 Ancora Heart
 AnX Robotica
 Apostle
 AristaMD*
 Astute Medical
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 Devices*
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 Avive Solutions
 Banyan Biomarkers
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 BillionToOne
 BioAmp Diagnostics
 Biocept
 BioFluidica
 Biological Dynamics
 Biomerica
 BioPhotus
 Biotheranostics
 BioTrace Medical
 Bluestar Genomics
 Bridge Diagnostics
 Cell IDx
 CeloNova BioSciences
 ChromaCode
 CKD USA
 Cliniqua
 Compellon
 Confirm BioSciences
 Cue Health
 CureMatch
 CVAC Systems
 Cytelligen
 CytoVale
 Dare Bioscience
 Dentsply Sirona
 DermTech International
 Diagnostics For The Real
 World
 dorsaVi USA
 Drawbridge Health
 Earli
 Elixir Medical
 Enable Biosciences
 EpicGenetics
 Epigenomics
 ET Healthcare
 Evolve Biosystems
 Factorial Diagnostics*

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 Fluxergy
 Force Impact
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 Genalyte
 GlySens orporated
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 eptus Medical
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 INOVA Diagnostics
 Invivoscribe Technologies
 IONpath
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 January
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 Kurin
 Lucid Circuit
 Lucira Health*
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 Mass Spec Lab
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 MDRejuvena
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 Metronome Health
 Microtek*
 MicroVention
 Millennium Health
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 NephroSant*
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 NuFACE
 NXT Biomedical
 Organovo
 OrthAlign
 Palette Life Sciences
 Patient Safe Solutions

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 Prelude
 ProciseDx
 Profusa
 Pulse Biosciences
Purfresh*
 Quidel
 Ra Medical Systems
 Reflow Medical
 Renew Biopharma
 Renew Medical
 ReShape Lifesciences
 REVA Medical
 Scanwell Health
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Sprightly Health*
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 Sysmex America
 Tandem Diabetes
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 Immunology
 Larta Institute
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 Institute
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 Research Institute
 (MMRI)

PRISM
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 Biological Studies, The
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 Research Institute
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 Institute
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 Xontogeny
 Zef Scientific



Marine Essence® Biosciences (ME Bio), is an essential company in the US extracting high-purity sea cucumber Type-I collagen for various applications including but not limited to, medical devices for trauma and chronic-infectious wounds, raw materials for R&D, and skincare & supplements.

ME Bio holds US patent for Biomaterial and Topical Compositions for Treatment of Skin Abnormalities.



Applications

- ✓ Collagen Analytical Standard
- ✓ Medical Device
- ✓ Nanotechnology
- ✓ Regenerative Medicine
- ✓ Biomaterial Research

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1(866)-MEBIO-01

Seallagen-MCT Echinoderm Collagen



Naturally Crosslinked Collagen Fibrils and Glycosaminoglycans



Features



- ✓ Non-mammalian, BSE & disease vector free
- ✓ Cleaner at miRNA levels
- ✓ Increased surface area, media ratio
- ✓ Translatability - *in vitro* to *in vivo*
- ✓ 2D and 3D cell applications

ME Bio is currently seeking for potential commercial partners who would be interested in becoming distributors or furthering research and development of this unique biomaterial.

To inquire about partnership opportunities, please contact via info@m-e-bio.com

Seallagen Echinoderm Type-I Collagen



> 98% Purity

Table 1. Comparative testing of Seallagen against other collagen standards on the market. The tests include: amino acid content (%), total protein content (ug/mL), purity by SDS-PAGE (%), peptide sequence (gene name).

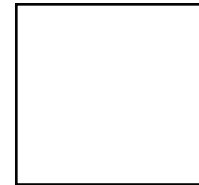
Sample Collagen	Amino Acid Content		Total Protein Content (ug/mL)	Purity by SDS-PAGE (%)	Peptide Sequence (Gene Name)
	Gly (%)	Imino Acids (Pro + Hyp) (%)			
Seallagen	22.9	23.7	1463.0	>98%	Col1A2
Human	24.6	28.2	596.3	>95%	Col1A2, Col1A1
Bovine	24.1	27.8	873.6	>80%	Col1A2
Rat Tail	22.3	27.3	158.6	>85%	Col1A2, Col1A1



10996 Torreyana Rd, Suite 200
San Diego, CA 92121-3021

www.biocom.org
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