

New Mexico Bioscience Authority (BSA) Board of Directors Regular Meeting

March 20, 2024, 11:30 AM – 1:00 PM

317 Commercial St. NE, Suite 311, Albuquerque, NM

Present: Dale Dekker (Chair), Greg Byrnes, Dana Catron, Tom Kieft, Paul Laur, Francisco Pallares, Dr. David Perkins, Tanner Schaub

Absent: Christos Christodoulou, Prisca Tiasse, Nora Sackett

Staff Present: Stephanie Tofighi, Sterling Nichols

#	Agenda Items	Board Actions
1.	Call to order and	The Chair called the meeting to order at 11:30 AM. A quorum
	Confirmation of Quorum	was confirmed.
2.	Approval of Minutes:	The Chair called for a motion to approve the January 18 th ,
	 January 18th, BOD 	2024, meeting minutes.
	Meeting	
		After he called attention to a name and title change needed
		on page eight, a motion was made by Paul Laur to approve the
		January 18" minutes with a second from Greg Byrnes.
		A roll call yoto of all board mombers was called with seven in
		the affirmative none in opposition one in abstention and
		three absent. The vote was as follows:
		Byrnes-Affirm, Catron-Affirm, Christodoulou-Absent, Dekker-
		Abstain, Kieft-Affirm, Laur-Affirm, Pallares-Affirm, Perkins-
		Affirm, Sackett-Absent, Schaub-Affirm, Tiasse-Absent
3.	Announcements and	Chair's Report: March
	Chair's Report	
		NMBSA Chair Dale Dekker provided an update on the
		following items of interest for the month of March.
		<u>2024 Legislative Update</u>
		Ine chair announced that current efforts to get the 2024 Co-
		investment legislation passed have not been successful. He
		Informed the board that NIVIBSA Director Paul Laur would



		provide more insight on the Co-Investment Legislation in the
		upcoming March Executive Committee Report; Agenda Item 7.
4.	President's Report	President's Report: March
		NMBSA President Dr. David Perkins stated that he had no
		announcements for the March President's report but
		expressed interest in hearing Director Laur's perspective on
		the Co-Investment Legislation in the March Executive
		Committee Report.
5.	Executive Director's	Executive Director (ED) Stephanie Tofighi provided an update
	Report	on the following items for the month of March.
		Correct Development in Disseiones
		<u>career Development in Bioscience</u>
		ED Tofighi has been active by participating in events relating to
		career development in bioscience. Tofighi said the state has
		recently included the BSA's participation in career events
		which makes for an added voice in the conversation that
		relates to the bioscience industry as well as business
		development in New Mexico
		National Science Foundation Experiential Learning for
		Emerging and Novel Technologies Grant (ExLENT) NSF 23-507
		The BSA seeks to submit a proposal for the ExLENT grant in
		September of 2024. Additional details would be discussed
		during the Mission Accomplishment Committee report;
		Agenda Item 9.
		NMBSA-UNM Facilitated Internship Program Update
		A potential candidate for the Facilitated Internship position
		was interviewed, however the candidate accepted a different
		position that relates to their doctoral interests. The BSA will
		continue to move forward in their search for interns by
		participating in the Facilitated Internship Meet and Greet
		Event at the UNM Anderson School of Management on
		Tuesday, April 9, 2024. The Meet and Greet event will focus on
		educating potential interns about the BSA and its mission for



bioscience while seeking a candidate to assist with the New Mexico Bioscience Connect Ecomap logistics and operations.
New Mexico Bioscience Connect Ecomap
ED Tofighi announced that the Ecomap is on schedule to launch following a successful introduction of the Ecomap at the New Mexico Rural Bioscience Ecosystem Meeting at Spaceport America on February 28, 2024. Attendees at the meeting were given a tutorial on Ecomap. Attendees provided valuable feedback that will be essential for its growth.
NMBSA-Ecomap Technologies Webinar
ED Tofighi conducted a recent webinar with Ecomap Technologies regarding the Small Business Administration's (SBA) Growth Accelerator Fund Competition.
Santa Fe Business Incubator (SFBI) Meeting
ED Tofighi met with SFBI Program Manager Carl McClendon and the New Mexico Angels President Drew Tulchin to discuss the proposal the SFBI submitted to the SBA's Growth Accelerator Fund Competition Grant. ED Tofighi noted that she can provide grant submission support to SFBI member companies in support of the SFBI's goals to improve the economy of northern New Mexico.
<u>New Mexico Biomedical & Biotechnical Association (NMBio)</u> Lunch and Learn Event; February 20, 2024
ED Tofighi and NMBSA Director Nora Sackett presented at the NMBio Lunch and Learn event which addressed increasing visibility for organizations such as the BSA and the New Mexico Economic Development Department. The event focused on increasing their impact. The Lunch and Learn event allowed ED Tofighi to formally introduce the New Mexico Bioscience Ecomap while providing insight on the BSA's efforts to support bioscience business growth.
New Mexico Career Development Association Annual Conference at UNM Valencia Campus; February 22, 2024



		ED Tofighi participated in a papel discussion about
		opportunities for biosciences and the type of career paths
		students should take to take advantage of opportunities. The
		Ecomon was also introduced at the event
		Econiap was also introduced at the event.
		The Rural New Mexico Bioscience Ecosystem Meeting at
		Spaceport America; February 28, 2024.
		The second meeting for the Rural New Mexico Bioscience
		Ecosystem was a success as the about 30 attendees were
		provided a tutorial of the Bioscience Connect ecomap. Also at
		the meeting was NMBSA Director Paul Laur, who gave a
		presentation on the Mercury Bio Company and talked about
		some of the paths taken by bioscience startup companies in
		the state. NMBSA Director Francisco Pallares provided a tour
		of the Spaceport facility following the meeting.
		Lichland Lich Cohe al Concer Fain Albumurgung Alba Marsh
		Highland High School Career Fair - Albuquerque, Nivi. March
		20, 2024
		ED Tofighi attended the Highland High School Career Fair to
		educate students about the New Mexico Bioscience Authority
		and the career paths to follow to pursue careers in bioscience.
		Executive Director Stephanie Tofighi concluded her report for
		the month of March.
6.	Mercury Bio Update	Dr. Richard Sayre, Chief Science Officer at Mercury Bio
		company located in Santa Fe, New Mexico joined the BSA's
		March 2024 board meeting to present on Mercury Bio and its
		current focus on developing molecular drug-delivery
		technologies.
		Dr. Cours is an accountist of a constant with a Destaurts in
		Dr. Sayre is an accomplished scientist with a Doctorate in
		work oversigned has been your diverse. Source has served on
		notable scientific consertiums such as the BioCassaug Blue
		program funded by the Pill and Melinda Cates Foundation
		which involved the orgina oring of Cassava plants in Africa to
		become a one source feed. Source also served as Chief Science
		Officer for a national consortium funded by the United States
		Department of Energy to reduce the price of algal biofuel with
		a consortium consisting of 12 companies 2 national labs and
		a consolition consisting of 12 companies, 3 national labs and



15 research universities from the US. Sayre has been recognized by Nature Magazine as one of five plant scientists that can change the world.

Through screen share, Dr. Sayre presented on Mercury Bio's focus on enhancing therapeutic drug stability, drug delivery and delivery efficiency using yeast extracellular vesicles.

Mercury Bio

Mercury Bio evolved from the original company which was named Spartina Biotechnologies. During the COVID-19 pandemic in 2020, Mercury Bio saw an opportunity to pivot the company and focus on therapeutics that would address SARS-CoV2. At the time of SARS-CoV2 there were no therapeutics for people that were infected. Mercury Bio then took advantage of the opportunity and decided to produce such therapeutics based on RNA Technology.

Soon, vaccines became available to protect against the COVID virus based on messenger delivery RNA's. One of the technologies that made RNA Vaccines and therapeutics possible was the delivery system. If RNA is injected to an animal or human, it degrades rapidly. While great promise for RNA Therapeutics has existed, it was the development of the delivery system that ushered the technology into fruition.

The Current Delivery system used by vaccine makers; **Moderna** and **Phizer** is *Lipid Nanoparticles*.

The Challenge: The Current leading drug delivery platforms have multiple limitations.

Limitations for Lipid Nanoparticles (LNPs)

PROS

- High Transfections rates
- They are effective for single use applications.
- Lipids are synthetic and not natural. Synthetic lipids can be toxic.



CONS
LNPs are unstable and require very low storage
temperatures.
• LNPs have limited access to organs in the body.
As a result of the limitations and challenges for LNPs, one of the newer technologies to address the challenges of LNPs is <i>Human Exosomes</i> .
Human Exosomes can be a safer alternative to LNPs but have many of the same challenges and limitations as LNPs.
Human Exosomes
PROS
 Protects nucleic acids from degradation.
 Native Lipids are safe.
 Potential for cell specific targeting
CONS
Can be expensive to produce and can be very costly to
scale.
• Contain off-target RNAS.
Mercury Bio's solution for effective drug delivery is to harness yeast extracellular vesicles (yEVs) from <u>Saccharomyces</u> <u>boulardii f</u> or safe, effective delivery of therapeutic molecules to cells. <u>yEVs are a safe, stable, low-cost solution for drug</u> delivery. Sacchromyces boulardii produces a lipid contained vesicle which can package drugs, proteins and nucleic acids.
yEVs are amenable to genetic engineering. Their membrane proteins can be modified to anchor ligands and/or enzymes.
yEVs can be targeted to specific cells to enhance drug delivery efficiency and reduce off target side effects. They increase the efficiency of drug delivery while substantially reducing potential off-target side effects.
In contrast to LPNs and human exosomes, Lyophilized yEVs and their RNA cargo are stable for months at room temperature.



yEVs can be held for months as freeze dried material with the ability to reconstitute them. The RNA cargo is intact and are very effective in delivering cargo to human cells. yEVs are safe. The yeast Mercury Bio possesses has been used as a Human Probiotic for over 65 years with a complete record of safety. Others have shown that the yeast Mercury Bio uses is nonimmunogenic and non-inflammatory. Mercury Bio's yEVS do not contain off target RNAs or do they contain human pathogens which is in contrast to human exosomes. In collaboration with the University of New Mexico Comprehensive Cancer Center, Mercury Bio observed that when yEVs are injected into mice or when delivered orally, they are accessible to every major organ in the mouse. The yEVs have long plasma circulation lifetimes. **RNA Therapeutics** Foundation yEV "OMICS" Studies Mercury Bio scientists conducted a study comparing RNAs that were in yEVs to those that are present in full cells. yEVs have distinct molecular signatures. Potential yEV cargo sorting motifs could be used to target specific molecules to yEVs Study concluded that yEVs can be loaded in vivo and in vitro with therapeutic RNAs for delivery to human cells. In vitro loading of drugs into yEVs can be accomplished by incorporating into yEV molecular pumps. These pumps are energy driven so they can concentrate the molecule on the outside to higher concentration on the inside. Human Lung Cell Culture Systems The next stage in testing the efficiencies of yEVs would be to utilize human models and animal models that would demonstrate whether a hybrid yEV system can deliver RNA efficiently to all organs in the body or to targeted organs.



Mercury Bio's current 'Targeting' efforts for utilization of yEVs

Mercury Bio is currently involved in a joint effort with Los Alamos National Laboratories (LANL) through funding from the New Mexico Economic Development Department's Division of Science and Technology. LANL is developing a Machine Learning or Artificial Intelligence tool to design ligands that will interact with cognate receptors. So far, they have been able to design ligands with binding energies that have high affinity potential.

Experimental Studies

Mercury Bio is conducting experimental studies that synthesize peptides in *E. coli* that will be distributed to LANL's Chemistry Division who will conduct experimental studies.

Conclusion

Mercury Bio understands the value of yEVs which can be applicable to the delivery of various therapeutic RNAs including: Messenger RNAs, Small Interfering RNAs, Self Replicating RNAs, and Amplifying RNAs

Mercury Bio has demonstrated they can load all these molecules into yEVs and deliver them potentially.

Packaging Therapeutic Proteins

Mercury Bio is eager to load proteins in particular antibodies into yEVEs in order to deliver antibodies intracellularly within the cell which is not possible with current technology. Currently there are antibody therapies on the market for Alzheimer's, but the challenge will be in the delivery. If Mercury Bio can develop a way to deliver antibodies inside of a vesicle package directly to cells, they would anticipate that intracellular delivery of antibodies would be much more efficient than extracellular delivery. There are great opportunities for newly developed protein therapeutics.

Small Molecule Drugs



		For smaller molecular weight drugs there are opportunities to repurpose old drugs that worked well in <i>IN VITRO</i> models but in animal models failed due to toxicity. There is an opportunity to repurpose numerous drugs that did not perform in terms of the delivery aspect.
		Mercury Bio's Business Mission
		Mercury Bio's business model prevents it from becoming a drug development company, however, their main objective is to license their technology to pharmaceutical companies and biotechnical companies that have an existing product.
		Mercury Bio has had recent success with the New Mexico Small Business Administration (NMSBA) program that conducts research using super computers and specific instruments that a start-up company would find expensive to buy during their beginning days of operations. The NMSBA program is ideal for start-ups.
		Fentanyl Crisis
		Mercury Bio has also discussed developing applications to address the current Fentanyl epidemic. They have some concepts in mind for detoxifying Fentanyl such as using 'Fentanyl Sponges' to rapidly remove Fentayl from the blood. The sponges won't remove it from the blood as fast as Narcan , but as a long term therapeutic in addressing addicts, Mercury Bio views a possible opportunity to provide assistance for a disease that has challenged and impacted New Mexicans.
		Dr Sayre concluded his Mercury Bio Update.
7.	Executive Committee Report • Co-Investment Legislation Update Report	NMBSA Director Pau Laur informed the BOD of the latest developments involving the stalled 2024 Co-Investment legislation. Director Laur said following the 2024 Legislative session in which the Co-Investment bill would not be messaged by the Governor, he contacted Alex Greenberg who is the Economic Development Policy Advisor for Governor Lujan-Grisham and a former BSA board member. Laur met with Greenberg at the



Governor's office to discuss some recommendations for the Co-Investment Legislation.
In reviewing the Legislation, Greenberg expressed his concerns using three categories: Due Diligence, Optics and Presentation.
1. Due Diligence – An assurance that a core competency exists to administer large sums of monies.
 Greenberg considered following the lead of the New Mexico State Investment Council (SIC) Using a third party such as Mercer Global Investments Inc. who conduct's investment opportunities for Government agencies
Laur concluded the Due Diligence category stating that following the 2022 Legislative Session, suggestions were made to reduce portions of the bill, however, Greenberg proposed to expand it by citing more specific language and terms. Greenberg offered his assistance in reviewing drafts of the bill but with the understanding Gubernatorial approval is not guaranteed.
2. Optics – An assurance that conflicts of interest do not exist.
 Generate local media interest by initiating 'Op-Ed' pieces favoring the legislation. Garner public opinion that expresses support for the legislation
3. Presentation – Adding more structure to the bill by including more specific language, terms and conditions
 Try to describe the size of an investment depending on the investment stage for the company of interest. Add more structure for implementation of the bill. Hire staff to manage the fund while assuring resources exist for proper fund management. Find other funds to complement '<u>State Money.'</u> *** Provide specific language in the bill about repaying the limited partners on the distribution of funds if companies are successful.



		 Acknowledge if a company moves out of state and the state receives 10 times the return on an investment it should not be considered a mishap. Acknowledge the investment as an Evergreen Fund and add a sponsor from the house of representatives who support the bill. Acknowledge the current dearth of Initial Public Offerings (IPOs) Offer a board seat if the investment is a Series A
		investment. Seat could be offered to someone from the board or someone the board appoints with an interest in economic development in New Mexico.
		***In regard to Greenberg's recommendation to ' <i>Find other</i> <i>funds to complement State Money'</i> , Director Laur said a good example would be when entities such as UNM assemble a research fund or The New Mexico Finance Authority or the SIC wants to put money into a fund, this will be considered as receiving a 3-1 match, 4-1 match, 6-1 match instead of 2-1 match with state funds. Laur proposed to pursue Greenberg's suggestion regardless of the state funds. It will have more of a pull for funds coming into the state that will a present a push approach to pass the legislation.
		Director Laur concluded the Co-Legislation Update by emphasizing that the BSA has an opportunity to become a prototype for additional types of Public-Private partnerships for other industries if successful. Acknowledging that Laur's assessment was correct in the BSA becoming a prototype with a template for investing that can be utilized for other industries, BSA Chair Dale Dekker said he remains positive that there is time to work on the legislation as the next legislation will be 60-day session. He noted that hopefully we can present a bill that has universal buy-in.
8.	Finance Committee Report	Monthly Financial Statement Review: January & February Strategy and Policy Director Ryan Cangiolosi presented the January and February 2024 Financial statements to the BOD via Screen Share:
		January 2024



	Mr. Cangiolosi reported that there were no significant changes to the budget for the month of January. The only changes to the budget were for expenses such as staff salaries, rent, and Fringe benefits. An upcoming change to the budget will be attending the International BIO Conference in San Diego for the month of June 2024. Costs will cover Executive Director Stephanie Tofighi' s participation at the BIO conference's New Mexico Pavilion .
	February 2024
	Mr. Cangiolosi reported that there were no significant changes to the budget for the month of February except for Staff Salaries, Rent, Legal Fees and other operational expenses. The Chair added that the state appropriations have been received.
	Following the January and February financial statements presentation, the Chair called for a motion to approve.
	A motion was made by Tom Kieft to approve both financial statements with a second from Francisco Pallares
	A roll call vote of all board members was called with eight in the affirmative, none in opposition, none in abstention and three absent. The vote was as follows:
	Byrnes-Affirm, Catron-Affirm, Christodoulou-Absent, Dekker- Affirm, Kieft-Affirm, Laur-Affirm, Pallares-Affirm, Perkins- Affirm, Sackett-Absent, Schaub-Affirm, Tiasse-Absent
	Ecomap Technology Job/Internship Module
Ecomap Technology Job/Internship Module	Through Screen Share, Tofighi shared the Ecomap Technologies add on costs for the inclusion of a Job/Internship module to the current Bioscience Ecomap. Tofighi explained that Job/Internship module is an addition to the Bioscience Ecomap created by Ecomap Technologies focusing on bioscience in New Mexico. Previously, the BOD approved the basic Ecomap programming package, but the approved package did not include a module for a Workforce Portal. However, as the BSA approaches areas of workforce development utilizing the Ecomap, it would be very beneficial to include the portal as an add-on in that it specifically aligns



		with the Governor's Center of Excellence that calls for the engagement of student populations she said. The add-on will meet the needs of students who are interested in engaging with the state's bioscience companies. The price of the add-on which is a 'Workforce Portal' will be
		\$5,000. The Portal will contain curated information on jobs, internships, apprenticeships, and various opportunities for students with an interest in bioscience. The Portal will be unique in that the information will be compiled from start-ups companies the Ecomap is tracking. Funding for the requested \$5k will come from the SBA Growth Accelerator Fund Competition Grant.
		The Chair called for a motion to approve the \$5K 'Add-On' request for an Ecomap Work Portal.
		A motion was made by Francisco Pallares to approve the \$5,000 request with a second from Dana Catron.
		A roll call vote of all board members was called with eight in the affirmative, none in opposition, none in abstention and three absent. The vote was as follows:
		Byrnes-Affirm, Catron-Affirm, Christodoulou-Absent, Dekker- Affirm, Kieft-Affirm, Laur-Affirm, Pallares-Affirm, Perkins- Affirm, Sackett-Absent, Schaub-Affirm, Tiasse-Absent
9.	Mission Accomplishment	At the March 13 th Mission Accomplishment Committee
	Committee Report	Meeting, Director Christos Christodoulou suggested for a niche division of biotechnology the BSA could be immersed in. For
		Experiential Learning for Emerging and Novel Technologies
	 NSF 23-507 Experiential 	(EXLENT), Biotechnology is a technology that has broad implications. The discussion at the March 13 th MAC meeting
	Learning for	revolved around developing a grant narrative around the
	Emerging and	significance of biology in space and the potential for students
	Technologies	throughout the state that are incorporating bioscience related
	(ExLENT) Proposal	aspects into their product and service development. A
	Update	collaboration with NEXUS could be valuable moving forward.
		With such broad implications, the BSA seeks to engage with the different categories of ExLENT to create internships for



Pre-Medicine undergraduates and Graduate students that are looking for Biochemistry and any Study of Medicine related Graduate programs. The internships would allow students to get experience in the Technological and Entrepreneurship aspects of medical research that would determine a continued interest in medicine while evaluating the potential of their intellectual property and what opportunities it could create.

In recognizing the potentiality for students to get internship experience, Tofighi has been in conversation with Christina Salas; a Professor in Biomedical Engineering and an appointee for The Department of Orthopedics at the UNM Health Sciences Center School of Medicine. Salas has experience serving as a liaison for the Medicine and Engineering departments in which the BSA has particular interest. Internships will be three-year programs with a focus at UNM in the first year and collaborating with New Mexico State and New Mexico Tech in the succeeding years. Tofighi continued stating there are three tracts for the ExLENT program:

Pivot Tract – Tract for students who have a specific discipline of study then pivot. Students usually pivot from a non-STEM (Science, Technology, Engineering and Math) field of discipline into a STEM field of discipline.

Beginnings Tract – *The BSA will target the beginnings tract.* For students possessing an introductory background in STEM. The target is for undergrad Pre-Med students looking for a specific domain of a STEM degree and bypassing the Entrepreneurship and Research tracts.

Exploration Tract – Measures what experience the student has in STEM.

In closing, ED Tofighi mentioned that the BSA submit a proposal for the ExLENT Grant by mid-September of 2024. The ExLENT Grant is for \$1 Million over three years with most of the funding directed at the creation of paid internships. In addition to the ExLENT submission, Tofighi will work on producing a White Paper for review at the next MAC meeting on April 10th 2024.



10.	Other NMBSA Related	2024 International BIO Conference
	Business Discussions	
		NMBSA Director Greg Bynes announced that The New Mexico
		Biomedical and Biotechnical Association (NMBio) will be co-
		partnering with the Albuquerque Regional Economic Alliance
		(AREA) for the planning of events at the BIO Conference' New
		Mexico Pavilion.
		At present there are more financial expectations to meet
		before the conference which is in June Byrnes said. However,
		we have quite a few companies that have made commitments
		to participate at the Pavilion and hopefully the companies that
		submitted applications for STEP Grants will receive them.
		Burns admitted there will be good representation from the
		Fo and Sandoval County, Organizations such as Sandia
		National Labs have committed and will facilitate a
		sponsorship. Byrnes noted that he is waiting to see if Los
		Alamos National Labs will commit once they have personnel in
		place. Overall, everything is developing according to plans for
		this year's conference Byrnes said.
11.	Adjourn	The Chair called for a motion to adjourn the meeting.
		A motion was made by Tom Kieft with a second from Francisco
		Pallares
		A roll call yote of all board members was called with eight in
		the affirmative none in opposition none in abstention and
		three absent. The vote was as follows:
		Byrnes-Affirm, Catron-Affirm, Christodoulou-Absent, Dekker-
		Affirm, Kieft-Affirm, Laur-Affirm, Pallares-Affirm, Perkins-
		Affirm, Sackett-Absent, Schaub-Affirm, Tiasse-Absent
		The Chair adjourned the meeting at 12:53 PM.
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Respectfully submitted by Sterling Nichols and Stephanie Tofighi