

OK. Welcome, everyone. My name is Jamie Costa. My pronouns are she/her/hers. And I am the gallery experience associate at the Los Angeles Municipal Art Gallery. We're thrilled to present today's program with Maru Garcia in conjunction with her solo exhibition, *membrane tensions*, which is now on view at lamag.org through April 22.

Before I introduce Maru, I have a few housekeeping bits. First, please make sure your microphone is muted during the speaker's presentation. We'll have a few minutes toward the end of the program for a Q&A, so if you have any questions, please feel free to enter them directly in the chat or, if you feel comfortable with taking yourself off mute at that point, you're more than welcome to ask Maru your questions directly.

And as a reminder, this program is being recorded so that it can be made available on LAMAG's website at a later date. We also have live captioning available via the link in the chat, as well as sign language interpreter services for today's program, which have generously been provided to us by the City of Los Angeles Department on Disability. If you requested sign language interpreter services, I recommend pinning their screens to your window for easier access throughout the program.

And with that, I am really excited and honored to introduce Maru Garcia. Maru Garcia-- she/her-- is a transdisciplinary artist and researcher working across art, science, and environmental disciplines. Her methodology includes both the social and hard sciences, combining a versatile laboratory and field work from her background in plant chemistry and the chemical industry.

Her use of media includes research, installations, performance, sculpture, and video, usually with the presence of some kind of organic matter to help understand the biological processes occurring in complex systems. Garcia's work highlights the importance of eco aesthetics, where relationships and community are proposed as a way of building a sustainable culture. At the same time, she questions the ways science and technology have influenced the relationship between humans within the natural world.

Garcia has participated in conferences, solo and group exhibitions in North America, Europe, and Asia. She was an artist in residence in the National Center for Genetic Resources in Mexico and received awards from the Los Angeles Sustainability Collaborative, Clifton Webb Scholarship for the Arts, and Fundacion Jumex.

She is based in LA and holds an MFA in design and media arts from the University of California, Los Angeles, as well as an MS in biotechnology and BS in chemistry from Tecnológico de Monterrey, Mexico. And with that, I'm going to turn it over to Maru.

Thanks so much, Jamie, for introductions, and thanks, you all, for being here. I'm very excited to be able to share at this time a little bit of this project with you all. So I think Jamie's now going to start presenting this. Well, before that, of course, I want to thank to thank the Los Angeles Municipal Art Gallery for commissioning this installation called *membrane tensions*.

This space includes a site-specific component and a sculptural and digital work and originally was meant to be for a hybrid form. At that time when we were planning this, we thought that by now, we would be able to enter the gallery. But unfortunately, we are still in these COVID restrictions. And we are all invited to see it through this medium. Next one.

So I want to start this talk framing this piece with the rest of my previous research within the category of eco aesthetics. And being ecology, the study of the relationships between organisms and their environment, I used eco aesthetics to bring relationships to the center of my practice. This helps me think more in terms of ecocentric ideas instead of anthropocentric ones.

In previous work, I have been interested in understanding our place as humans within the rest of the natural world. One of those works have been vivarium, the *vivarium* series, in which I was trying to explore what was our place within the natural world.

Next, I also tried to go further and promote encounters with the other through prodigals and this in a way to develop interspecies relationships. And in this image, as you can see, just at water and the culture, both this type of prodigals wanting to forge relationships with plants or with microorganisms. Next one.

With invitation by Donna Haraway of *Making Kin*, I started to think of how it was possible that life emerged. And in this case, for this piece, I center my attention on kinship, as well. Acknowledging our relationships formed through millions of years, evolutionary biology has allowed us to think in our common ancestor that scientists say can be traced to a single cell.

What researchers call LUCA, the last universal common ancestor, can be the evidence we need to see the rest of living organisms as part of their family. Would this allow us to be more careful, more empathic, to develop a better relationship, with the rest of the natural world? Next.

Here, you can see the tree of life that represents LUCA as a common ancestor in a simplified way, giving origin to the three life domains, bacteria, archaea, and eukaryotes. And of course, we are somewhere there, in the eukaryotes. Next one.

And this is a more complex version of the history of life, of this big family that we are part of. And we can also, then, mention time and how all those diverse organisms were evolving. The Earth is about 4.5 billion years old. And there is evidence to conclude that LUCA may be up here, around 3.5 billion years ago. There are scientists that say that it was even farther in time. Next one.

So I wanted to go further to understand even what happened before LUCA. How did life emerge? Although a definition of life is complicated and there is not consensus about it, we have seen that life involves process and patterns.

There are several speculations of how this could happen. There is some scientific research that are pointing towards the origin of life in a deep sea hydrothermal vent. Another point for the primordial soup. Or even we can say about the building blocks-- scientists are saying that probably, it could be that those building blocks arrived from outside the Earth and that found the proper environment to develop.

While the details of this process are still unknown, the prevailing scientific hypothesis is that the transition from non-living to living entities was not a single event but an evolutionary process of increasing complexity. And this process involved molecular self-replication, self-assembly, other catalysis, and the emergence of cell membranes. Next one.

Before life, began, I imagined all these different chemical compounds floating and sometimes encountering each other, reacting with each other and some protocells forming by the action kind of an encapsulation. Of course, this formation not always was successful but eventually, with time, with an energy that was around, probably one prevails. And maybe RNA was already there and was also trapped in this capsule.

Here, you can see an image of what could be a protocell, that it's not having a nucleus or anything, but it's just the representation of RNA and other floating chemicals. But it's important to note that for life to emerge, a container was needed. Containers create new worlds new reactive conditions in the inside and a space to get in contact with the surroundings. Next one.

But what can be considered as a minimum expression of life is contained inside of a two-layer membranous structure made of lipids. Here, you can see the image of a membrane as the outer limit that separates itself from its surrounding environment.

But more than imaging, the image of this rigid and static structure-- next-- it's more permeable, fluid, active, and responsive to limitation, contains but it doesn't isolate. The membrane, through ion channels, electro flow, and the transfer of other molecules, is the basis of communication. This limit allows the creation of new relationships. Next one.

There are actually studies that are related to the tension that is produced in the membrane that affects the cell functions. And it's related to signaling and motility. Here, you can see an example of the membrane stretching, moving, stretching in all directions.

And as I was mentioning, some of these studies are saying that the importance of the membrane and of the tension of it is-- it's even being studied for signaling and motility and the function of the cell. So for me, reviewing the idea of the need of a membrane for life to happen but, at the same time, the need to interact with the environment and the tension that is created in it, it's what made me think of exploring the possibility of using the membrane as a metaphor, maybe of the tension between the individual and the collective and the possibility of stretching our containers to include the others. Next one.

Coming back to this evolutionary analysis, one other concept that informed my research was encountering the Lynn Margulis' endosymbiotic theory. She was an American evolutionary theorist, biologist, science author, educator, and was a primary modern proponent for the significance of symbiosis in evolution. If I explain to you what is the endosymbiotic theory, I want to mention how Margulis' work has been very important to me.

First, her position about the way scientists are making science and the reflection that we need to go further reductionist approaches; shifting the perspective of studying isolated optics to focusing on the relationships that are between the optics; the idea of going beyond linear thinking governed by cause-effect and embracing systems thinking that considers feedback loops; thinking in terms of patterns and relationships. For her, there is not such a thing as a fully independent organism.

Symbiosis, that means living together, we are all, in fact, experiencing the moment that we have our microbiome. That is all the microorganisms that are living in our body. She used for calling that-- the fact that we are living with this microbiome-- that we, in a way, are forming a unit, an ecologic unit, what she called a holobiont. You can see her working in the lab and some of the organisms that she was analyzing. Next one.

So now, I want to explain about her theory of symbiogenesis. And this one is a theory that proposes that mitochondria and chloroplasts-- some organelles that now we can see in eukaryotic cells-- were actually descended from formerly free-living cells that were engulfed, or trapped, and stayed in one of the cells through generations.

So this was a way of creating a permanent community where they were sharing space and resources. What symbiogenesis helps us to understand is that one of the main drivers of evolution was through associations. And this is something that I was really considering for this piece. Next one.

So we can now go back to the idea of LUCA and think, was this single cell possible, the idea of a single cell beginning like a champion of the fire of life? And maybe we can start thinking more as thinking of the original [INAUDIBLE] community.

And we can find evidence in microfossils pointing out to microbial communities. Here, you can see an example of a fossilized microbial mat, cross section of a stromatolite that is actually found as evidence, as well, of these very ancient communities. Next one.

So a revised version of the tree of life is making scientists think that, instead of a single cell, it was more a common ancestral community of primitive cells. So we are still family, but we have never been isolated but related.

This [INAUDIBLE] like structure also considers the lateral gene transfers of the endosymbiotic theory so that you can see that the organelles coming from previous bacteria are also associated. In this case, bacteria that gave rise to chloroplasts and bacteria that gave rise to mitochondria are kind of the elongations that are relating all these domains of life. Next one.

So in this case, *membrane tensions* wanted to explore the contained, the merged, the engulfed, and the stretched in order to understand common origins and ways for building a culture able of remediation, healing, and regeneration. As you saw in the research, I wanted to go back and try to see life and its origins and explore the metaphors that are around them. Next one.

The first section of this installation presents living as sculptures of a SCOBY. And this stands for Symbiotic Culture of Bacteria and Yeast. And it's the same culture that is used to produce the drink called kombucha. This is exactly a community of organisms living together. What the one produces can be the food to the others.

And these cultures can be in the gallery since November. And the conditions are monitored weekly by LAMAG staff. Here, I want to give a special mention and thanks to John Weston, who has been crucial for the realization of this project. He has been taking good care of the cultures. Next one.

Some microorganisms that are in the culture are able to produce bacterial cellulose. Cellulose is the same material found in plant tissue and used for producing paper. This cellulose is harvested on-site and used to intervene the gallery windows.

For me, the act of covering the windows is an invitation to stretch our membranes and be able to interact with the other, to extend our range of care, this intervention wants to place all of us inside of a big cell membrane. We will see this harvesting process in a few minutes in the livestream happening right now. But here is an image of a John pasting these membranes to the window. Next one.

As a way of experimenting process on time scales, the installation includes cameras pointing to the inside of one of the tanks and a second one pointing to the windows. Here, you can see a short version of a time lapse created by footage coming from the gallery. The idea of having both angles joined by this membrane was to bring fluidity and the continuity of passing from the interior and exterior and vice versa.

As we extend the membrane that bring us together, the side is extended in the metaphor of the window, the one that is giving us access to the work through the use of technology-- in this case, the streams of this time-- and forming a sense of common experience and, at the same time, separating us from the work but also the window that is shared, where the sense of community is born as we are all invited to continue intervening spaces with membranes. This is why the workshop, *Playing with SCOBY*, is part of the piece. And the windows of our homes can become an extension of this site-specific installation. Next one.

The second part of the installation presents lightweight sculptures and drawings made of the same material-- bacterial cellulose. This could be thought as an extension of the idea of the lab, where the analysis of the specimens and observations are made. Next one.

This is that what I call the symbiogenesis codex, where you can see this story of what I was telling you of those engulfed organisms, one inside of the other, happening in this drawing. With this, I want to present it as a way of palaeontological evidence as part of our own history.

There is a second one that you can also view on the website of a single cell that is already evolved through time and already contains the mitochondrias. Next one. Other three-dimensional specimens are included in the section where the membranes can be seen in light projections, stretched and shaped. Next one.

These pieces also make reference to the cell inside the cell exposed before and, of course, to the properties of the cell that wants to contain but also to stretch and absorb. Next one. This is a detail of one of the projections coming from the membranes that are in one of the projections. Next one.

This is another specimen showing the cell inside of the cell. That is talking about the symbiogenesis theory. Next one. And you can see the rest of all this documentation on the website.

Life has always been embedded in communities-- bacteria, fungal, plant, animal. We are all traveling companions, individual and collective at the same time, holobionts. Thinking of myself as an ecosystem formed by other ecosystems that lives in a larger ecosystem and then a set of ecosystems that compose the Earth makes me then mention my place.

In a world where walls are built, where isolation, confinement, are part of our current reality, and where individualistic and egocentric ideas are the basis of societies, I question if we could change that for membranes capable of interaction, a place of encounter and relationships. Next one.

Of course, I want to give, again, a special thanks to the people that helped to make this happen. Special thanks to Steve Wong, the former curator for LAMAG, that was the one that contacted me for this piece; Don Weston, as well, that you will see his intervention of this piece but also really very grateful for all his work; Jamie Costa, as well; and all the LAMAG team that made this possible. OK, and I think that it's the moment to move to the second part, to the performative part.

So as a way of transition, I can just explain that, well, this installation has been a LAMAG from November, the part of the tanks, and that we have put these cameras. And they have been taking footage from it. And the livestream started yesterday, so you can be part this part of the installation. And we will see what happens every week in which we do the harvesting and the intervention of the windows.

As you can see, we have a view of one of the tanks and also the windows are being intervened. And maybe I will just allow you to see.

OK, here, I just want to mention what happened was the harvesting of the membrane. Of course, we are having those two cameras are going one after the other. So sometimes, we are able to see what is happening in the microscopic-- kind of microscopic-- point of view. We are feeding, right now, the culture with sugar and checking the conditions, as well.

The membranes, or the films, are formed in this culture. They acquire the shape of the container in which they are grown. So in this case, that is why we're having the circle-- round-- shapes for for the cultures that are being placed in the windows.

Well, I think the harvest process will continue. We're taking the pH right now. And everything is documented in a format to keep track of the health of the cultures. I know that John now is very expert on kombucha growing.

Very well. Maybe we can stop it here. If you're interested of knowing what is going to happen later, this livestream is still happening. So you're invited to check it today. I think it will stay there. So I think that's it. Thank you, Jamie.

Thank you so much, Maru. And I don't know if John can hear me, but thank you, John, for letting us-- or taking us with you as you are doing the harvesting. This leads to our Q&A section. And if anyone has any questions they would like to ask Maru, feel free to enter them directly into the chat. Or if you feel comfortable and would like to take yourself off mute to ask Maru your question directly, you're more than welcome to do that now.

But maybe as folks are thinking of questions, I do actually have a few questions for you, Maru, just to kick things off. You talked a lot about community and just in working with the organic matter and that history.

And obviously, the use of technology, I think, in a way, really enables this community to expand in a lot of different ways. And I wonder if you could elaborate a little bit more on the community and technology relationship and aspect and how you consider technology to be a part of that or maybe not be a part of that or how you figure in technology with community.

All right. Yeah, well, it's a question that I always ask myself, too, in which sense technology is actually helping us come together. We can see that, well, we are now together. We are, actually, through technology, able to share experiences, to share ideas and time. So I think it's a two-- or you can go both ways.

Of course, technology allows us to make these type of things happen. But at the same time, it's isolating us. So for me, the community, it's through technology but also outside of it. Like, the idea of sharing time and space can be mediated, and it is, in this case.

But well, probably not people that know me, they know that I'm really very hands on. I really need to touch things, to feel things, to experiment things in real life. And, of course, through this pandemic and what we are all right now experiencing, we are having this hybrid life of the virtual and the real. And sometimes they collide. But some others, we're just in the in-between.

So probably, and it's part of the present moment that we are facing that. And still, the need of community's there. We are having our communities from the people that we are living with in our own houses. But also, we are part of other communities that are distant and that we also interact with.

So the need is there. And the need to interact and to expand our sense of community is also there. And I think just of technology as another way to engage with community. Yeah. But thank you for your question.

Great. Thank you. I have a few more questions. So I'm going to self-indulge a little bit. Just, if anyone else has any questions, please chime in or, again, just enter them in the chat box, and I will read them out.

But I wonder, Maru, that point you made about the hands-on nature of your work and just being really physical with it-- and I think that speaks a lot to the science aspect of your work and just that experimentation and just being in that environment-- and I wonder if you wouldn't mind sharing a little bit about how this process of creating work that's in the gallery and, so to speak, having John be your hands, like the laboratory hands, how that has been for you and just any takeaways you have, if that's something that you'll be carrying into your work and practice moving forward.

Yeah, to be honest, this is the first time that I actually experimented that. I'm usually the one that wants to be feeling how is the space and have more of a sense of what is going to happen in the installation. And probably, I can say that it's work to be experienced in person.

In this case, it was another type of experience, for sure. And I think that there was kind of a connection with the cultures. Because that's part of what I explore all the time, these interspecies relationships. For me, it's very important to keep track of subtle things, like the smell, the temperature, like the pH. A lot of things are around the living-- in this case, the culture-- that makes me know that the culture is actually in good health, in good conditions.

So now that I was not able to really catch on those small details, it was through John that I was like, John, what did this smell like? And he was like, well, like, kombucha, maybe. But the thing is, we started to develop a method of really checking with this, and we started to develop the way to learn how to take care in a long-distance way.

But also, it made me allow things that usually, within organic or nature systems, happen that it's like the unexpected. And this is kind of the lack of control of all things and just leaving to emergence to happen. And I was part of this experience, too. Because there was this other person that was able to do things and combined this human/non-human system to bring all this together.

So yeah. I see here in the chat for more questions. Is it OK if I just answer them?

Yeah, I think let's keep it in chronological order. So if you want to address Sean's question first and then, Jogan, after Maru addresses that question, please feel free to take yourself off mute and ask Maru your question directly.

All right. So Sean is asking, how long does it take for the membrane to form, and is there a right or wrong time to harvest it? And does light play a role in the overall process? So well, it depends on what is their intention with the culture.

If your intention is to obtain material-- because, actually, this is something that people is doing to try to develop what is called biomaterials, so it's like a replacement for other type of not-that-sustainable materials-- so if you are wanting to have a material for that type of experimentation, you would need to leave this membrane at least one month growing. So it develops thicker, and you're able to do more things with it.

In my case, I don't really have a right or wrong time. Probably, the things that I wanted the film to be completely formed, and that would require at least one week. And that's why we put it like that. Because it's the time that it takes for the microorganisms to secrete this cellulose that is actually a natural polymer.

So they secrete the cellulose. And it's kind of a weaving process but in a natural and microscopic way. So for them to really complete that, it takes around one week. But you want it more firm or more thicker, yeah, it would require a longer time.

And yeah, a lot of the conditions that are related, or that are inside of the culture, will dictate if the membrane or the film will develop complete, or sometimes they present holes and things like that, so yeah, also in this case, light could create, for example, lighter membranes, compared to a place where it's darker. But probably, one of the conditions that needs to be kept is also pH and temperature. Then, yeah. And that's it.

Thank you, Maru. Jogan, if you would like to take yourself off mute now and ask your question.

Sure. Good afternoon, everyone. And congratulations, Maru, for this terrific presentation. What really struck me in your presentation is the time scales that are involved and the slowness of the processes that are involved, processes that involve beings that are so small that it can go unnoticed, in a sense.

But these very beings, they form the basis of life on Earth. And you talked about relationships. And so I wanted to ask you what is your relationship with the various cultures you raised, if I may say so, and also maintain now?

OK. So I have kind of-- well, thank you so much for asking the questions and for joining us for this presentation, Jogan-- appreciate this. Yeah, there is a lot of relationship mentioned. Because, as I was saying, it's part of my own practice.

In this case, for me, the microscopic organisms are related with this SCOBY material that is actually the culture of a SCOBY, I started to research about them in a previous work-- *the culture*, it's called, that work. And that involved being with them in a more immersive, or embodied, way.

That time, for that experiment, I was trying to put different tanks and allow the cultures to kind of share my own culture. So I was, like, sharing my culture to these SCOBY cultures and, at the same time, trying to see what was their response. So that was part of experimentation.

And then, a second part was me actually wanting to spend more time with them in a tank where I was able to get immersed in it. So that was kind of my starting point, that it was really wanting to go in an interspecies relationship that could be more embodied.

I think, with those cultures, since then, with me-- so I have a couple of cultures still alive in my own place. And well, in general, I am fascinated about the fact that they can be living and part of my normal life. I'm not saying that I'm like producing kombucha or anything. I just have them, of course, for my own practice, but also-- I don't know if it's correct to say but because of joy.

So besides those type of cultures, I also explore other type of cultures that we use, like for producing bread, for example, or fermentation, other type of things. So if there is a relationship, it's like they are part of my life.

[CHUCKLES]

Thank you.

Thank you, Jogan and Sean, for your questions. I just wanted to make sure before I forgot, I included a link to the next program Maru will be participating in that she mentioned. It's called *Playing with SCOBY*, happening on March 26 at 1:00 PM. Please join us if you are able to. And I received one direct question, Maru, that I will-- is it easier if I copy and paste it, or should I just read it out to you?

You can read it. You can read it.

OK, so the question is, I have heard that the microbiome in our bodies is reactive to those we live with. Can you offer any more insight into this idea through your research?

Yeah, definitely. As we were exploring during the presentation, we are already holobionts. Like, these organisms are habiting in our inside also another type of organisms. So where we go, what we do, what we eat, modifies or changes completely what we are having in our inside of our bodies-- in this case, our microbiome, so exterior and exterior, like the ones that is in our skin but also the one that is living inside of our bodies. So yeah, definitely.

Of course, when we interact with people, when we sit, when we just live, we are sharing space with microscopic organisms. I was very interested even in this idea of people, for example-- talking about bread-- people that prepare bread, they get microorganisms coming from the bread they are preparing if they do it in a regular basis. So we are sharing just the space all the time, even if we don't notice.

And, of course, there is some concern. A lot of people are microphobic in the sense of like, no, microorganisms are bad. Of course, some of them-- some of them, I don't know, we get sick because of them. But it's not that all of them are like that.

And the fact is that we actually need them. Because they are the ones that produce, for example, in our own stomachs, produce a lot of substances that help us digest our own food. But also, there are some other research that mention that they actually affect, also, our emotions through the chemicals that they produce.

So there is a correlation between where we eat, what they do. What are the cultures that survive because of the conditions that they find in our own bodies? So yeah, definitely, we are changing all the time. And we are interchanging our microbiome with the people that we live with.

Thank you, Maru. Forgot to unmute myself. I just have one more question. Unless anyone else has any other question they would like to ask Maru, we can end it on that? But something that really strikes me with your exhibition, Maru, is just the use of light and how light comes into play with your work. We saw it with the pedestals, the dimly lit surfaces, and then even the gallery.

There are the balcony door lights, how the light-- when you see the time-lapse video from the sun and then even from the moon and some of the street lamps-- how that comes into play, and then also with some of the sculpture objects that you have. And I was just curious if you could talk a little bit more on the relationship with light with respect to the work in the show and how that figures in with the membrane tension and other concepts that you're speaking to in your work.

All right. Yeah, probably there is two things that I'm thinking right now-- one, the fact that in the science, we use a lot of light. And that can relate in the moment that when you use a microscope, what you are seeing is the light so you can be able to go and see the small details and things through the membranes, in the case of microscopic organisms.

So light help us to really see the world that we are in in a different way. And in the case of science, it help us to explore it in a more complete way. So that's one reference. And probably, you will see that in my work a lot because of that.

And also, I think this could be more like the representation of this organism that its reflection would just disappear. And it's like, in a way, somehow what we encounter through evolution. A lot of the times, we're wanting to find the piece, the evidence. But some of them, they will just be lost.

So the idea of this, the reflection just goes away, it's part of what is wanting to communicate with this. Yeah, sometimes evidence are lost and in this case of this evolving story of life. Yeah, that would be the two ones I am thinking of.

Great. Thank you so much, Maru. Thank you to everyone who joined us and just really massive thanks, Maru, for sharing your time and your insights and just this really incredible exhibition and work that you have it LAMAG. And I would highly encourage folks, if you have not yet seen *membrane tensions*, please visit lamag.org, especially for the livestream feed that we have going up right now for the aspect that we saw today.

And massive thanks, also, to the Department on Disability for providing us with today's sign language interpreter services and livestream text. We really appreciate you being here and just thank you, thank you, thank you.

And one final plug-- or before I do that, I also just would be really remiss if we did not acknowledge and thank John Weston. Yay. Thank you for just everything that you do and especially for today's performance and, again, taking us with you as you have been doing this work for the past several months and just everything you do, John. So thank you, thank you, thank you.

And again, if you can join us on Friday, March 26, again with Maru-- thanks, Gabe, [INAUDIBLE]--

[LAUGHING]

--if you can join us on Friday, March 26 with Maru again, we have a LAMAGPlay Playing with SCOBY workshop. There is a supply list, so please make sure you visit our website to see the supply list and register for it, although it's free. And with that, I think we'll close the program. Thank you so much, everyone. Take care. Stay safe. And we'll see you virtually again soon.