

LATAM MAGAZINE

Learn about the projects that are being developed by the Latin American Teams.

Delicious recipes inside for you to try such as: sopapillas, chilaquiles verdes, arroz con leche and more. Learn about the challenges that Latin American teams face reaching the competition

Discover what to do when visiting Latin America

Take a look at some memes related to LATAM projects!



WELCOME TO IGEN **LATAM**

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ABOUT US

THE TEAM

Uchile_Biotec is a group of students from the University of Chile that is highly motivated in contributing to the extension of molecular biotechnology and synthetic biology in order to innovate in useful solutions for society.

OUR MISSION

In order to strengthen ties between Latin American countries, we have decided to create iGEM LATAM, a magazine that mainly introduces the Latin American teams participating in the iGEM competition of 2018, together with the projects that are being developed by them. In order to promote the transfer of knowledge and provide information about the countries that are in competition. In addition to conducting talks and other types of dynamic activities in conjunction with the magazine, we seek to contribute to the extension of science, biotechnology and synthetic biology to society and raise awareness of the importance of these areas of study and work as potential tools in the search for real solutions to different problems that we face on a daily basis.

OUR VALUES

The values of our team are: integrity, honesty, commitment, perseverance and respect for others. We realized that it was necessary to create a protocol in order to maintain a healthy atmosphere during the project's development to avoid problematic situations and to know how to proceed when these take place.

We named our protocol "Paihuen", because it means "to be at peace" in Mapudungun, the Mapuche language, and through that word we described the principles of these protocol.

Protocol for maintaining good relationships is very important for us.

And our pillar to comply that, is to respect and have no violence of any form.

In iGEM we learn about teamwork and perseverance but this only.

Happens in a good way if we.

Use our values and empathy to.

Enable a peaceful atmosphere where the main thing is.

No violence and no discrimination, only a lot of tolerance.

LATAM MAGAZINE 2018

TecCEM
Tec-Chihuahua
Tec-Monterrey
TecMonterrey_GDL

USP-EEL-Brazil

Ecuador

ColegioFDR_Peru

Uchile_Biotec

What is biotechnology?

To understand the projects that will be presented in this magazine, it is necessary to introduce the concept of biotechnology. An internationally accepted definition is the following:

“Any technological application that uses biological systems and living organisms or their derivatives for the creation or modification of products or processes for specific uses. (Convention on Biological Diversity, Article 2. Use of Terms, United Nations, 1992) “.

Therefore, the field in which biotechnology can be involved is very broad, since it covers all forms of life.



What is synthetic biology?

It is a branch of biotechnology that consists in the design of biological systems to achieve different functions from those that would be obtained normally.



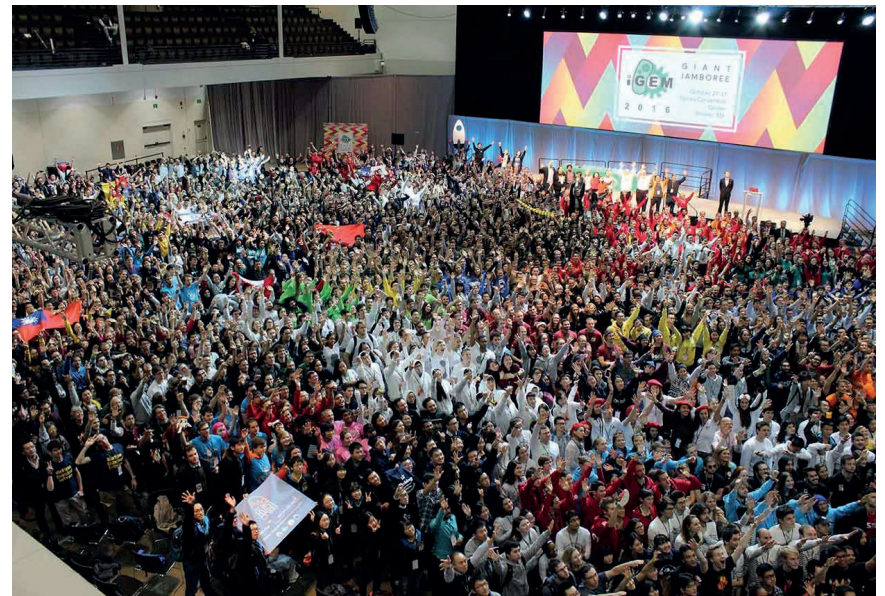
What is synthetic biology used for?

There are therapies based on synthetic biology to treat immune pathologies, repair damaged tissues, create organisms capable of detoxifying the environment, among other things. As you can see, the applications are numerous and of great human impact.



iGEM

It is a competition that takes place annually in Boston, United States. It is the most important competence in the area of synthetic biology in which scientific institutions from all over the world participate.





GET TO KNOW

LATAM 2018



Team Description

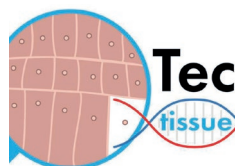
TecCEM

The team is formed by 16 members of the Tecnológico de Monterrey Campus Estado de México: chemical, industrial, robotic, biotechnology and computer systems engineers. Each of the members has a passion for discovering new technologies and a great love for science.



Facebook: iGEM TEC CEM
Twitter: igemteccecm
Instagram: igemteccecm

Project's Field
Diagnostics
Project's name
TecTissue



General description of the project and how it relates to the current situation in your country

Second-degree burns are the main cause of infant deaths in Mexico and generate a great economic impact both to affected families and in health systems due to their complex treatment. Therefore, we are seeking to reduce hospitalization time through the realization of a drug that, in addition to having analgesic and antimicrobial properties, it will be able to induce a rapid cellular regeneration of the affected tissue. Therefore, we are working with growth factors, extracellular matrices and organic molecules that will be tested in cell lines to measure their cytotoxic and regenerative effect.

In which instances has your team interacted with another team

Our team has sought to make a common front with all teams in Latin America in the iGEM 2018 competition, trying to support them with feedback given by specialists and obtaining important statistical

information for the validity of their projects. But, we are also looking to characterize the biobricks of Latin American teams to provide them with relevant information. Finally, we have also sought to promote a collaborative environment with a large number of teams, through the production of a music video in which more than 25 teams participate.

What were the difficulties or obstacles that arose during the development of the project?

The main difficulties we have had in carrying out our project have been economic and logistical problems. In the first area we have faced that the reagents and the laboratory materials in Mexico are very expensive and difficult to obtain. In logistics, we had customs complications with the delivery of the iGEM kit and for the shipment of parts. But, above all, we have noticed that Mexican companies and the general population do not support scientific projects, instead they support sports projects.

Which activities have you done or plan to do as part of human practices?

Our main Human Practice is the collaboration we have with the RinoQ foundation, which is in charge of the integral recovery of children who have suffered burns. In this practice we went two days to work with them to approach the problem and make an application to raise awareness among the population about the prevention and care of burns.

On the other hand, we participated at the Universum Museum during a complete weekend. There we carried out biology activities and gave talks on the prevention of burns. Finally, we are looking to assist several schools in our community to report on this topic and our project.

What would you advise to the future teams that participate in iGEM?

-Divulge your project in social networks and to colleagues to make science known.

-Find several teams and read their abstracts to see possible collaborations.

-Find the good division of work in your team and give weekly goals.

-Priorize the synthesis of parts and the purchase of reagents and material.



Favorite typical food of the team:

Tacos de pastor, bistec, chuleta and chilaquiles

What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

During September 16th, Mexico's Independence day is celebrated, where it is customary to eat typical food and see the recreation of the shout that Miguel Hidalgo gave, calling the Mexican people to become independent.



Cultural information

The university in which we study is located in the State of Mexico a few kilometers from the capital, the city with the most museums in the world, great gastronomic and architectural centers and a great night life. In addition, this city has experienced great historical events, such as the beginning of the Aztec civilization, the Spanish colonization, the independence and the Mexican revolution, but, especially the birth of great painters, writers and poets.





Chilaquiles verdes recipe:

1. Put in a pot green peeled tomatoes, the peppers and fill with water until everything is covered. Put on low heat.
2. Pass the tomatoes, chilies and 1/3 of the water in which they were cooked to the blender and make the sauce.
3. In another large pot, put the sauce, season with salt and cook over medium heat until it is reduced a little and the flavors are concentrated (about 5 minutes).

4. In a large pan, put about 1 cm of oil. Fry half the tortillas until golden brown (about 3 minutes).
5. Leave 1/4 cup of the oil that was used and return all the tortillas to the pan.
6. Add the onion and cover the pan. (about 4 minutes)
7. Add the sauce and cook moving another 3 minutes.
8. Serve the chilaquiles and put cream, fresh cheese and chopped cilantro on top.

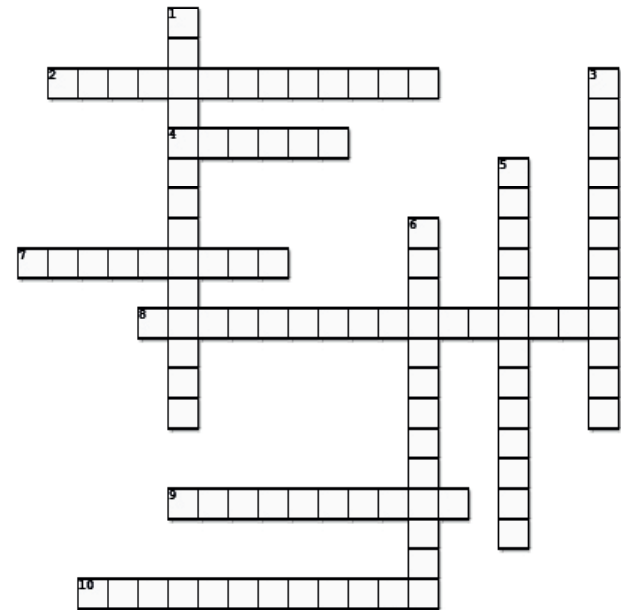


Book they recommend

The great catalog of journals of the UNAM (Autonomous University of Mexico)

Crucigrama TecTissue

Encuentra las palabras relacionadas con la regeneración de tejidos



Created with TheTeachersCorner.net Crossword Puzzle Generator

Horizontal

2. Células de la epidermis
4. Soporte de células para su crecimiento hecho de un material biocompatible
7. La muerte celular se llama
8. Células que se pueden cultivar in vitro
9. Medicamento que quita el dolor
10. Reparación de un tejido dañado creando uno nuevo

Vertical

1. Compuesto que mata bacterias o inhibe parcialmente
3. Células de la dermis
5. Células pluripotenciales a convertirse en cualquier célula
6. Crecimiento de células

Leisure

(Activity and meme)

Quando tu ajolotita te rompe el corazón




Pero lo puedes regenerar






MEXICO



Team description

TecMonterrey_GDL

We are a diverse group of students composed by the areas of biotechnology, computer systems, digital art and marketing committed to the well-being of our community.



Facebook: iGEM 2018 Tec GDL

Twitter: TeamTecGDL

Instagram: igem2018_tecgdl

Project's Field
Health

Project's Name
Latobachill



General description of the project

More than three hundred million people suffer from depression and anxiety around the world. Although there are many therapeutic strategies available, new treatments that target the bowel-brain axis are gaining importance today. Due to the strong relationship between systemic inflammation and psychiatric disorders, we designed Lactobachill, an intelligent psychobiotic that, in addition to its probiotic properties, provides benefits to the mental health of the host. We propose two strategies to block the trans signaling pathway of the pro-inflammatory cytokine IL-6, which is triggered by an increase in nitrosative stress levels. First, the secretion of the soluble forms of the IL-6 receptor (sIL-6R) and gp130 (sgp130), the IL-6 signal transducer bound to the membrane and, secondly, the secretion of a variant mutated of sIL-6R that can not be joined to gp130. Non-conventional therapies, including psychobiotics such as Lactobachill, could be used

as adjuvants to increase the effectiveness of existing treatments against these mental disorders.

What were the difficulties or obstacles that arose during the development of the project?

The biggest difficulties we have faced so far have been mainly: the lack of specialized equipment in our laboratories, lack of economic resources and also the delay involved in the process of synthesis of genetic material and its arrival to us.

In which instances has your team interacted with another team?

We have made video calls with different teams around the world looking for possible collaborations and some of them have been formalized but the details have yet to be defined. Undoubtedly, the biggest event of relationship we have had was the meetup of the Latin American teams organized by the Tec CEM team.

Which activities have you done or plan to do as part of human practices?

We have gone to different public secondary schools to disseminate what biotechnology is, we have contacted various psychologists and psychiatrists to have more knowledge about the mental illnesses we are working with, we made a panel of experts about myths and realities of depression and we plan to do an “open book” session with patients of both diseases in remission that share their testimonies and an App that facilitates the contact with experts in the subject.

What would you advise to the future teams that participate in iGEM?

Try to get funds from companies a year before the competition. Most of them make their budget annually and therefore could not allocate funds to support teams that require support for this year.

Tourist information

Our university is located in Guadalajara, Jalisco, one of the most emblematic cities of the country since it has given rise to two of the main things that represent Mexico: tequila and mariachi. The city itself is full of activities you can do from going to museums and galleries to spend the day in one of the magical towns that surround the city. The climate of Guadalajara is one of the best in the country since it is not so hot in the summer nor so cold.



Favorite typical food of the team:
Tortas ahogadas and carne en su jugo.

What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

A celebration very typical of Mexico is the Day of the Dead, where our deceased are honored through the known altars of the dead.



Book or magazine they recommend

We would recommend the magazine of the Mexican Academy of Sciences, because it documents and disseminates the most important findings in science and technology of our country and the world.





Facebook: iGEM Tec-Chihuahua
Twitter: iGEM_TecChih
Instagram: igemtecchih

Team description

iGEM TecChihuahua 2018

The iGEM Tec-Chihuahua team is comprised of thirteen students from Biotechnology Engineering at the Monterrey Institute of Technology and Higher Education, Chihuahua Campus, Mexico. The team has participated in the iGEM competition in the 2015, 2016, 2017 editions and currently in the 2018 edition.

The year 2016 the team participated with the project "Myxobacteria" obtaining a bronze medal and in 2017 with "Erwinioos" winning a gold medal.



Project's Field
Food & Nutrition
Project's Name
AMP-A-BEE



General description of the project

The diseases American foulbrood and European foulbrood caused by *Paenibacillus larvae* and *Melissococcus plutonius*, respectively, are two diseases that affect the larvae of bees (*Apis mellifera*) throughout the world. At present, two techniques are used for the treatment of these diseases: Antibiotics, that promote the development of resistance to them and the incineration of the affected hives, which results in huge economic losses in the beekeeping industry. The overproduction of antimicrobial peptides (PAM), one of the main immune defense mechanisms of the bee itself, is proposed for its production in *Escherichia coli*. These possess abilities for the inhibition of *P. larvae* and *M. plutonius*. Defensin 1, abaecin, defensin 2 and apidaecin will be expressed in different cultures and a combination-based design will be used to find the most compelling synergy of PAMs. The product will contain a proportion of these dosed synergistic PAMs, these will be available for any

beekeeper to apply in their hives and inhibit the proliferation of pathogenic bacteria.

As bee diseases expand their territory and flowering rates decrease, the costs of treatment and care limit the growth of beekeeping companies. Beekeeping needs the help of scientific and technological advances to reach more of its potential, that is why we have decided to take this approach.

In which instances has your team related to another team?

From the beginning of the iGEM period we sought to meet the other teams, talk with them and, if possible, agree on a collaboration. We had the pleasure to make video calls with the teams of NCKU Taiwan, UChile_Biotec, NYU Abu Dhabi and UPV Valencia; In these conferences we were able to learn about their projects, talk a little about our countries, exchange tips to obtain better results in the laboratory or to agree on new collaborations.

On the other hand, in the Meet-Up Latin America we had the great pleasure of living for a whole day with the different teams in Mexico and also learning about their projects more thoroughly.

What were the difficulties or obstacles that arose during the development of the project?

As in the realization of any project, good financing is always necessary. In our case we have a large laboratory equipment, however, certain reagents or consumables purchase was impossible due to lack of funds. Many times we had to wait to do a fundraising activity or put our money as an investment, waiting to recover it later.

You can not expect to have perfect results every time you work, much less when you involve a biological

system as the basis of work. We had to do repetitions of protocols multiple times because they did not go as expected or the way they would be useful.

Which activities have you done or plan to do as part of human practices?

For Human Practices, two areas are considered, Integrated Human Practices and Education and Public Engagement.

For Integrated Human Practices, it was decided to approach regional, national and international beekeepers with the purpose of receiving feedback from experts in the area. In addition, it is planned to cover the legal area by analyzing the Mexican health laws as well as the bioethical, economic and social



aspect of the project.

For Education and Public Engagement several activities are planned for the diffusion of synthetic biology. We participated in the IV State Apiculture Forum attended by beekeepers throughout the region, collaborated in the Guide for the Evaluation of Environmental Risks for GMOs of the UN, we plan to participate in a United Nations model at the national level for young Mexicans, a Genetic Manipulation Forum was scheduled and we received an invitation to the International Congress of Beekeepers in 2019.

What would you advise to the future teams that participate in iGEM?

Begin by reading the requirements for medals.

When someone is given a canvas to draw from scratch, it is very easy to imagine many things, what is difficult is to maintain focus. We recommend you to manage local, national and international impact with your activities but always taking care to fully cover the local impact as it is your closest community.

Do not be afraid to try new things different to other years. iGEM is an internationally recognized competition, many people support the teams, if you do not ask, if you do not speak you will always wonder what could have happened.

Above all, love what you do, enjoy it, because you will spend a lot of time working on it.

Tourist information

Chihuahua capital is a city of contrast. The historic center, founded in 1709, boasts its architectural wonders: the Plaza de Armas, the Municipal Palace, the Metropolitan Cathedral, the Monument to the Heroes of Independence, the altar to the homeland and the Government Palace. Around this area of yesteryear, the modern and commercial city is located; with its endless cultural institutions and universities, as well as the industry that has become one of the main engines of the north of the country. Finally, in the periphery of the city we find the charming villages: the spas of Aldama, the apple orchards of Cuauhtémoc and the mines of Santa Eulalia.



Favorite typical food of the team

Tacos de pastor, barbacoa or tripitas and green or red chilaquiles with beans or eggs.



What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

The custom is that the children previously write a letter laboriously to ask Melchor, Gaspar and Baltazar for the toys they would like to receive. On the eve of the party of the day of kings (January 6th), they leave their shoes next to the window and the next morning the shoes are filled with a huge amount of toys.



Families also eat the traditional "Rosca de Reyes". It is usual to invite a group of friends and each one must take the knife to cut his or her portion. Inside the bread there is one or several small dolls (plastic representations of child Jesus) and the person who finds it is obliged to offer a party, tamales or atole, on the 2nd of february , Day of the Virgin of Candelaria.





Cheese stuffed chilis recipe

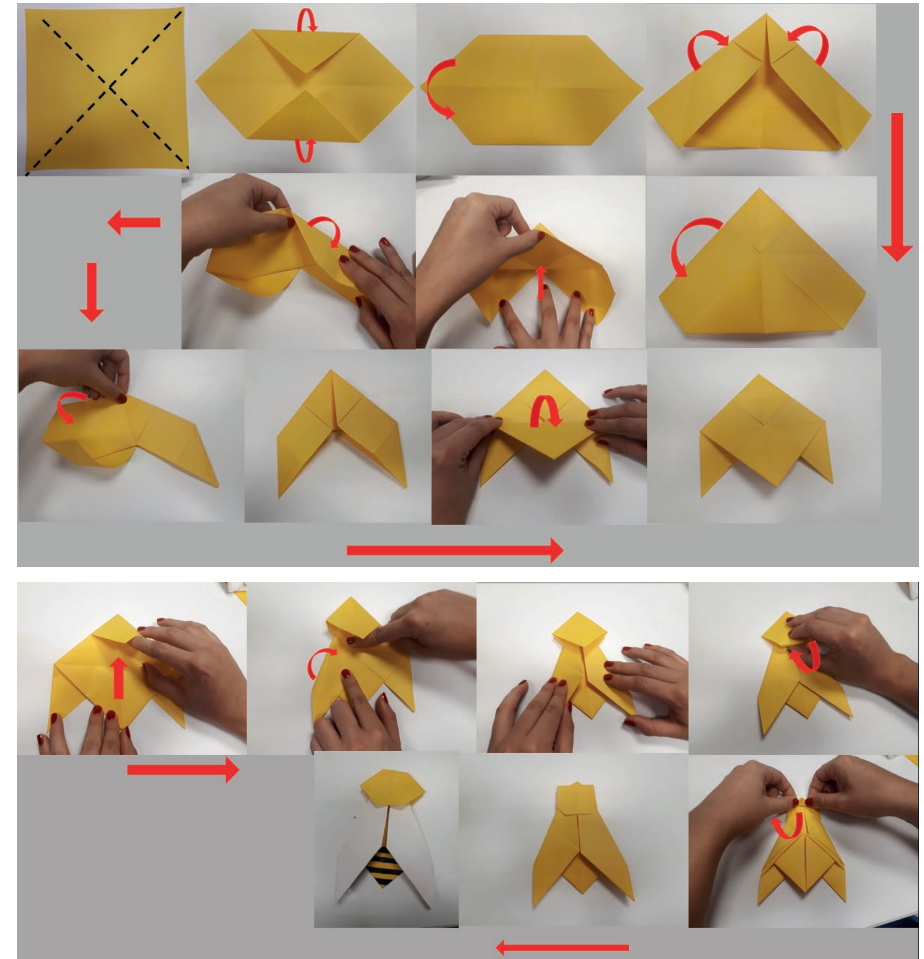
The first step is to remove the skin of chiles. To do this, the “poblanos” are placed directly on the fire, they must look burnt on all sides. They are placed inside a polyethylene bag so they can sweat, for half an hour. Then, with the help of a cloth, we proceed to scrape it to remove

the skin. This process is completed under the jet of water and carving with your hands delicately. Make a longitudinal cut to extract the seeds (under the water jet). Drain and fill with cheese. Bread and bring to the fire.



Book or magazine they recommend

“¿Cómo ves?” is a monthly magazine of the General Directorate for the Dissemination of Science of the Autonomous University of Mexico. It is directed especially to young people of baccalaureate. It has several fixed sections and 4 or 5 articles are written in each one. It has 1450 subscribers and 20,000 copies are distributed every month. Many teachers consider it a valuable support in the teaching of science.



Cuando crece algo en tu cultivo de *P. larvae*, pero no es *P. larvae*

Leisure

(Activity and meme)





MEXICO



Team description

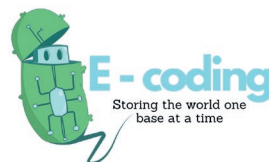
iGEM Tec-Monterrey

We are iGEM Tec-Monterrey, we belong to the Tecnológico de Monterrey University and we are a team of students from different careers such as biotechnology, biotechnology and chemical sciences, physics and even graphic design. Our goal is to develop biotechnology-based projects that provide a benefit to our society. It is our way of contributing to the positive development of our country.



Facebook: IgemTecMty
Twitter: iGEMTecMty
Instagram: igemtecmtty

Project's Field
Environment
Project's Name
E-coding



General description of the project

E - coding is a genetically modified bacterium with the ability to create messages in its genome, based on the stimuli it receives from its environment as if it were a USB memory with the ability to save on its own the information that is around it.

This project serves as an alternative to sense the contaminated rivers and lakes of Mexico, knowing in this way if the analyzed water was exposed to pesticides or herbicides that damage our flora and fauna. Based on the collection of this information it is possible to take actions to treat those waters, efficiently, and guaranteeing a better quality of life for the inhabitants.

In which instances has your team interacted with another team?

We have focused on collaborating as much as possible with other iGEM teams around the world from Germany, Chile, Uganda, France, Ecuador, Mexico, Australia, India, to name a few.

The collaborations have been done by video calls, presenting our project and listening to the project of the classmates and in the end we give ourselves feedback, which is very helpful because it makes us strengthen points that we did not have that developed. We have also attended events such as the MEET UP that was organized in Mexico City, we have collaborated in the laboratory with other teams and we have even compared the results obtained.

What were the difficulties or obstacles that arose during the development of the project?

At the moment of requesting the biological material or receiving the iGEM kit, great obstacles were presented. Without a doubt, there are many battles with customs and sometimes it is necessary to make investments that were not included in the initial budget.

Which activities have you done or plan to do as part of human practices?

In Mexico there are many people that still depend on bodies of water, such as the rivers or lakes to which they have access. However, in recent years, in the south of the country, there has been an increase in the incidence of health problems and one of the main causes is attributed to the use of water from these bodies. That is why, in collaboration with the organizations CONANP and CECROPIA, a route was drawn to the South of the country that covers Chiapas and Tabasco, to analyze water samples from regions where there are good agricultural practices, and from areas where it is known that there is no control in the use of chemicals to treat crops. This exhaustive analysis aims to corroborate if both industrial and agricultural practices are having a negative impact on these points analyzed, which are the basis or the sustenance of many Mexican families



What would you advise to the future teams that participate in iGEM?

1. Program the activities you plan to do from the beginning (Analysis and evaluation of the project).
2. Pay close attention to social networks, as they can help you get sponsorships.
3. Do not only learn to work in a team, become a family, you will see each other a lot.
4. Contact iGEMers from other countries, this will help you meet amazing people.
5. Enjoy each stage of this experience, which is undoubtedly unique.



What is (are) the favorite typical food(s) of the team? Mole and the enchiladas, regardless of whether they are green or red or made with chicken or cheese.



Tourist information

Our university is located in Monterrey, Nuevo León. Nuevo León is one of the most versatile states in Mexico, because no matter what type of tourist you are, you will surely find something to do in Nuevo León. You can visit its magical towns, such as Villa de Santiago or Arteaga. If you are a city person, the municipalities of Monterrey, and San Pedro should not be missing from your bucket list. Finally, if you like nature, you have a number of options, such as Chipinque, Estanzuela or Matacanes.



What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

One of the biggest celebrations in Mexico is on September 16, which commemorates the anniversary of the start of the War of Independence. Since the beginning of September you can see traditional costumes everywhere you go, and the celebration begins on September 15, because that was the day of the Cry of Dolores (in 1810). Women dress like Adelitas and men dress like revolutionaries, there are traditional dances and lots of typical food of the country. Everyone in Mexico celebrates that day, and families enjoy parades, fairs, delicious food and fireworks.





Enchiladas Verdes de Pollo

Ingredients:

2 Boiled and shredded chicken breasts

10 Corn Tortillas

10 green tomatoes

3 Serrano Chiles

1 Avocado

1 Onion

2 Cloves of garlic

1 Cup of vegetable oil

1 Tablespoon of salt

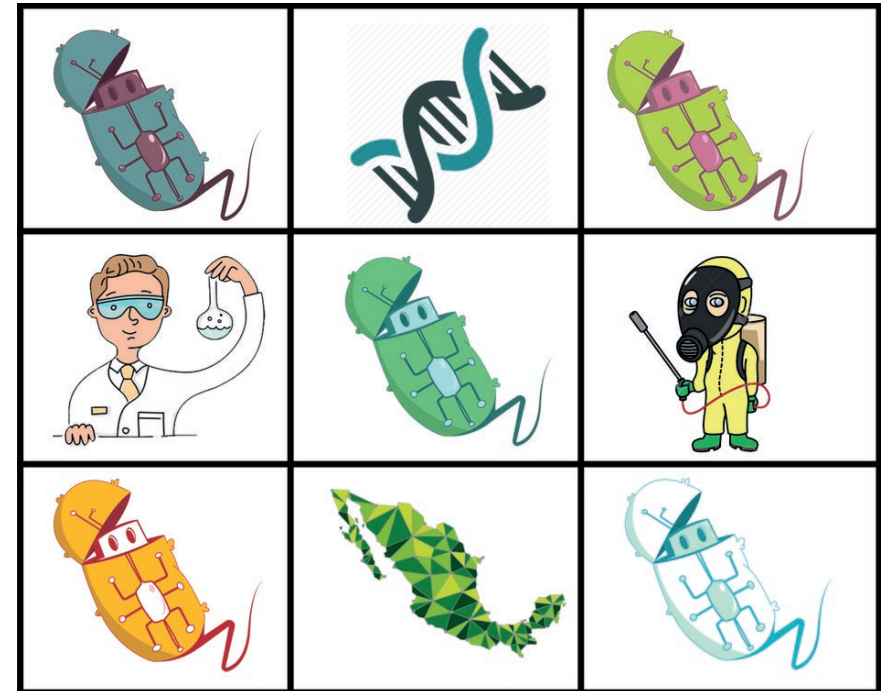
Cilantro, sour cream, fresh cheese, and pepper to taste. For the sauce: Bring tomatoes, chiles, garlic cloves and onion to boil over high heat. Once boiled, place them in the blender and add salt, pepper and cilantro to taste. Blend the ingredients well and boil the sauce over medium heat until it reaches a thick consistency. For the tacos:

In a pan, place the vegetable oil over medium heat and once it is hot, pass the tortillas through the oil for about 7 seconds on each side. NOTE: they have to be soft, not crispy. Once you have the tortilla lightly fried, fill with the pre-

viously shredded chicken and roll up. Repeat this process with the other 9 tortillas. Finally, pour the previously prepared sauce to taste and place the amount of sour cream and fresh cheese you prefer. This dish goes excellent with refried beans and salad of lettuce and tomato.

Book they recommend

We would recommend the book "Science, Technology, Innovation and Development: Latin American Thought" Compiled by: María del Carmen from Del Valle, Javier Jasso Villazul, and Ismael Núñez (2016). It is a valuable collective work where you can appreciate the participation of prominent Latin American thinkers, such as: Alejandro Nadal talking about technological changes in Latin America, Kurt Unger that focuses on the industrial sector, Leonel Corona who tells us about the link between the research and development centers, Gonzalo Arroyo, who talks about the agricultural and food sector



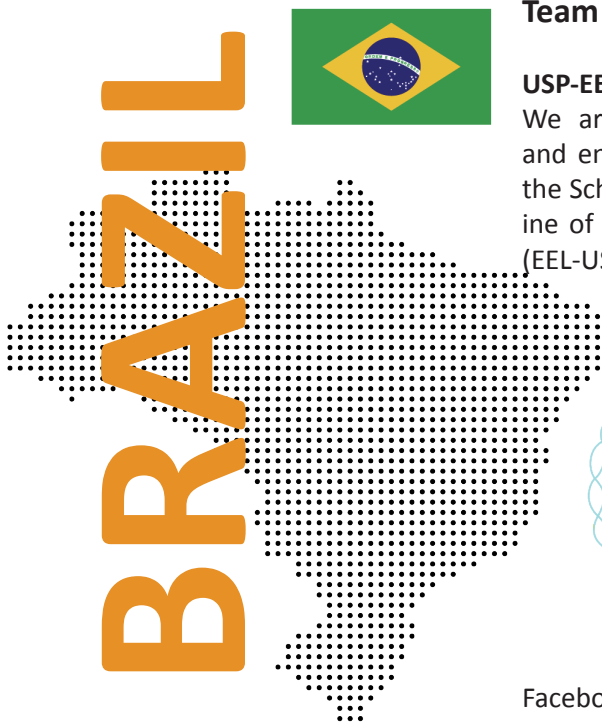
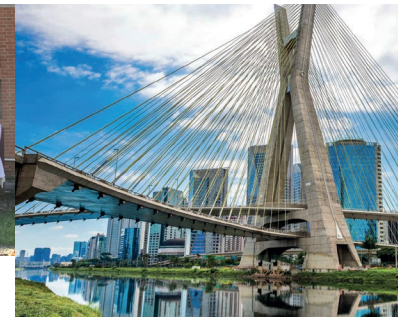
just to mention some of them. Undoubtedly, it is a must-see book that shows us how Latin American countries have evolved on these issues during the last decades.

Leisure

(Activity and meme)

María del Carmen del Valle,
Javier Jasso, Ismael Núñez
Ciencia, tecnología,
**innovación
y desarrollo**
El pensamiento latinoamericano





Team description

USP-EEL-Brazil

We are students of biochemical and environmental engineering of the School of Engineering of Lorraine of the University of São Paulo (EEL-USP).



Facebook: CBSin.EEL
Instagram: cbsineel

Project's field

Environment

Project's Name

Lacquase: Biodegradation of estrogens from water



General description of the project

The presence of estrogen in ecosystems is increasing. These compounds are biologically active endocrine deregulators, even in small concentrations. They can be especially toxic to fish and cause long-term harmful effects in humans and other animals. In Brazil there is no current legislation or monitoring to control the presence of these pollutants in the water. In addition, there is no effective treatment in the effluents for the removal of these micropollutants, keeping them in the environment. Our team's proposal is to create a method for the degradation of estrogens present in water. We intend to use genetically modified laccase enzymes from fungi to eliminate these microcontaminants from the sewer system. Our final plan is to simulate the actual application of this biodegradation system in effluent treatment plants

What were the difficulties or obstacles that arose during the development of the project?

The biggest obstacle was the raising of funds to pay for our participation in iGEM, from the registration of the team to the tickets and inscriptions for the Jamboree. Another factor that we are trying to overcome is the time for the execution of the project in the middle of the routine of the university and the availability of the laboratory.

Which activities have you done or plan to do as part of human practices?

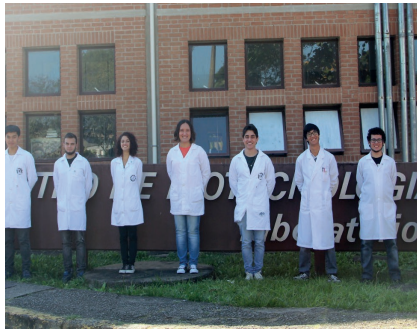
We are committed to spreading science to our local community, in the city and in the university itself, doing countless related activities in that area.

What would you advise to the future teams that participate in iGEM?

- Local team and project diffusion
- Plan well the execution of the project

Tourist information

Our campus is located in the city of Lorraine, in the state of São Paulo and is very close to Minas Gerais and Rio de Janeiro. Not far away, there are diverse options to enjoy walks, from the famous city of Campos do Jordão, the beaches of Paraty and the religious circuit of Aparecida do Norte.



What is a very celebration typical of the country? What is its meaning or reason why it is celebrated?

Fiesta Junina is a celebration that is celebrated in June, being characterized by bonfire, meals and typical dances.

Favorite typical food of the team:

Feijoada (Frijolada)



Book or magazine they recommend

Genética na escola magazine
(Genética en la Escuela)



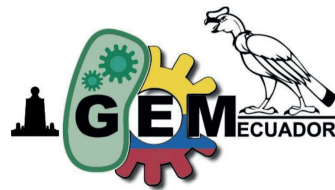
ECUADOR



Team description

iGEM Ecuador

We are a team of researchers related to the area of biotechnology, made up of students and teachers from the University of the Armed Forces. We dedicate our efforts to seek and implement innovative ideas that can create new scientific knowledge and help people. Always keeping our scientific curiosity active, looking for new horizons.



Facebook: iGEM Ecuador - Biología Sintética
Instagram: igem.espe.ecuador

Project's field
Biomedicine
Project's Name
C-lastin



General description of the project

In this project a new biomaterial based on the cross-linking of bacterial cellulose (BC) and elastin like polypeptides (ELP) will be developed, for its use in biomedical applications. The cross-linking of both materials will be carried out with synthetic biology techniques using the bacterium *Escherichia coli* as an expression system of the new biomaterial, and as a mediator of the cross-linking to two protein modules of the carbohydrate binding domain (CBD) specific for cellulose and a bone morphogenetic protein 2 module (BMP-2). Bacterial cellulose will be used as a bandage matrix, due to its biocompatibility in vivo with the body, in addition to its ability to provide an optimal three-dimensional substrate for cell attachment and a microfibrillar structure that provides flexibility and its high capacity for water retention and gas exchange, which allow you to obtain rapid epithelization and tissue regeneration rates. CBDs are protein modules found in carbohydrate enzymes

whose function is to bind cellulose carbohydrates, allowing the ELP protein to give greater flexibility to the bandage, while the BMP2 protein, which induces cell differentiation in osteoblasts, will be responsible for reduce the recovery time of bones.

To achieve the goal, the expression of the cellulose and the fusion protein in two bacteria will be carried out separately. For the synthesis of bacterial cellulose, an *E. coli* expression system will be used; introducing two plasmids: psb1C3 responsible for cellulose synthesis and psb1A3 responsible for the synthesis of the export system and overproduction. For the production of the fusion protein, the plasmid psb1C3 will be used, which will contain the genes of the proteins CBD, ELP and BMP2.

In which instances has your team interacted with another team?

We have contacted the Valencia UPV iGEM team, who collaborated by sending strains of E. coli. We greatly appreciate their help as these strains were required for the tests carried out in the project.

We chatted with iGEMers of the Estonian team to learn more about our projects and exchange tips for our work. We also have in mind a mutual collaboration.

What were the difficulties or obstacles that arose during the development of the project?

The main difficulties encountered in the realization of the project are associated with the economic part and reagents access, due to the difficulty to obtain financing or sponsorships for projects in new fields

of research such as synthetic biology by the national industry, in addition to the difficulty to obtain the necessary reagents at affordable prices and in a short period, due to its low availability in the country. These two conditions produced a delay in the realization of the project.

Which activities have you done or plan to do as part of human practices?

Among the main activities that have been carried out to meet the goal of Human Practice: expand knowledge and improve the conditions of synthetic biology in Ecuador are:

Realized activities

- Cooperation with the Ministry of the Environment and other organizations for the construction of the



country position in Biology.

- Dissemination of synthetic biology in schools in the country.

Activities to do

- Dissemination of synthetic biology in universities in the country
- Cooperation with the Ministry of the Environment for the reformulation and clarification of ambiguous laws that encourage the development of synthetic biology in the country

What would you advise to the future teams that participate in iGEM?

- Plan everything and determine the function of each member of the team.
- Look for collaborations with teams that have experience in the competition.
- Plan how to finance the realization of the project and expenses of the competition.

Tourist information

Ecuador is a country full of great nature richness, which is admired throughout its 4 regions ranging from the warm coast bathed by the Pacific, the valleys of the Andes, the Amazon rainforest and the Galapagos Islands. It has great diversity of flora and fauna, which places it among the 17 countries that contain the greatest biodiversity on the planet, it also offers historical attractions such as Quito, delicious gastronomy and a variety of cultures and traditions. The best time of the year to visit is in July for the good weather and you can do various activities such as discovering the secrets of the ancient churches and streets of Quito, hiking through the imposing volcanoes, excursions to the Amazon rainforest and extreme sports or enjoy the beaches and gastronomy of the coast and the insular region.



What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

“La Mama Negra” is an Ecuadorian celebration that comes from a symbiosis between indigenous, Spanish and African cultures. It is a ceremony designed to interpret the life of different people, such as miscegenation, capable of creating phenomena much more beautiful and rich than those that come from cultural exclusivism, in which its inhabitants pay homage to the Virgin of Mercy as a demonstration of gratitude for the favors granted.



Favorite typical food of the team
The typical dishes of Ecuador and

favorites of the team are the fritada and the colada morada with guagua de pan.



Arroz con leche recipe

Put rice in large saucepan with water, a cinnamon stick, lemon zest and salt.

Heat to high heat until it starts to boil, lower heat and cover until it almost absorbs all the water.

Add milk and sugar, raise the heat and stir until it thickens.

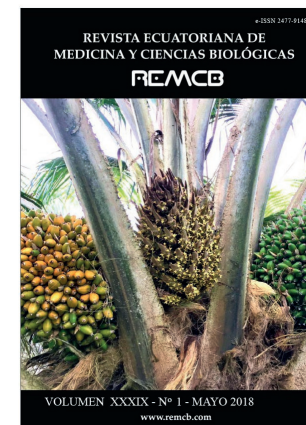
Add vanilla and cook 2 more minutes.

Remove from heat and let cool for 25 minutes.

Put raisins and sprinkle ground cinnamon to garnish.

Book they recommend

The Ecuadorian Journal of Medicine and Biological Sciences (REMCB) is a scientific dissemination body sponsored by the Pontifical Catholic University of Ecuador (PUCE), the Ecuadorian House of Culture Benjamín Carrión (CCE), and the Ecuadorian Society of Biology (SEB). It provides a relevant contribution to scientific knowledge through the description of processes, the solution of problems, or in which current and interesting information is synthesized in the areas of Medicine and Biological Sciences.



Leisure (Meme)





Facebook: iGEM at FDR
Twitter: @igem_fdr

Team Description

ColegioFDR_Peru

Our team is composed of students who are in high school. We also have Dr. Nina Markham, a teacher who guides us throughout our project. On the other hand, there are Daniel Guerra, Keren Espinoza and Pierre Padilla from the Universidad Peruana Cayetano Heredia that are like the others, are a crucial component of our project and our team.



Project's field

Health

Project's Name

Fishing for Mercury: Detecting and Removing Hg from Fish Meal



General description of the project:

In Peru, every day there is a greater contamination of toxic metals such as mercury (Hg) in the environment affecting the country and the rest of the world. One of the most important industries in Peru is fishing. Peru is the world leader exporting fishmeal and fish oil (40%), but every day there are more toxic metals such as Hg in its products. These metals in the products not only affect the environment, but are also ingested by humans affecting their endocrine system and in some cases causing cancer. Our team, realized that a change is needed now and we want to be part of it. With the help of T.A.S.A, the leading fishmeal company in the world (7%), and collaborating with the Universidad Peruana Cayetano Heredia (UPCH), we hope to bring the good path to our country. Currently, we are developing two plasmids that will be able to detect and eliminate mercury in fishmeal. One of the plasmids will accumulate the mercury and also note that the plasmid is in function with green

fluorescence while the other will self-destruct the bacteria and mercury with the "Killer Red" when the bacteria is in contact with the light. In order to implement our solution in fishing plants, we are also designing a container where the reactions will occur. We hope that with time, effort and research, we can bring a positive change to our country and the world.

In which instances has your team interacted with another team?

Until now we have only been able to collaborate with the Uchile_Biotec team with the development of the magazines of both teams.

What were the difficulties or obstacles that arose during the development of the project?

The first obstacle was that most of our group had not used the laboratory equipment that we needed to use. That was easily resolved after a couple of lessons. Another obstacle was to carry out the experiments correctly to have successful results. Another problem faced by the working group was to find a sieve that could pass the bacteria but not the fishmeal. Also while cutting the plasmids, we ran out of *SpeI*, a very expensive enzyme here in Peru, and we could not find it.

¿Qué actividades ha realizado como parte de human practice?

In human practices, we have carried out four different projects in three areas. First, the Colegio-FDR_Peru team has collaborated with “Girls Can!” and “Roosevelt speaks” to improve the interactive education of science, mathematics and engineering in primary school; Next, we have created three infographics for the Agricultural University, high school teachers and students; Finally, we are contributing and helping to design a science journal called “Journal of FDR Science”. We believe that as a Latin American team our responsibility in iGEM is to promote the culture of research and synthetic biology in our community. Also, helping the leaders of tomorrow.



What would you advise to the future teams that participate in iGEM?

1. Divide each team member's work clearly to do things right and make sure that the assigned people do their designated tasks. iGEM is more than a club because we work as a team. Each member must help others because everybody has different strengths and weaknesses.

2. Respect what each member is interested in. People who like to do experiments can be part of the laboratory team, while people who like to collaborate and communicate with others can work as a team of human practices. In addition, people who like to draw can design the team's logo and work on infographics about the project.

3. Use all available resources. There are many people who can contribute towards your project in your school or university. Science teachers can help you develop the project idea, computer science teachers can help you with the wiki page, and other students can help you spread the word about your project.

4. Have a document to which all the team has access that shows the dates of the meetings, expiration dates, laboratory experiences and all the relevant events so that the whole team can stay organized and well informed.

5. When you meet with your team, make small goals for each week of the things you want to do. This will keep everyone informed and motivated for what is coming.





Tourist information

Peru is a country that has beautiful scenery, flora and fauna, and archaeological sites, as well as being one of the best culinary destinations in the world. Machu Picchu, one of the seven wonders of the world, is located in Cuzco. This is an Inca stone city where after hiking to the top of the mountain, you can enjoy a wonderful view. Moreover, since Peru has a section of the Amazon rainforest, it is an

excellent idea to wander from the city of Lima to explore the jungle and the communities that live there. But there are many things to do in Lima, like paragliding through the beautiful panorama of Miraflores, or eating ceviche and Nikkei food in the best restaurants in the world.

Favorite typical food of the team:
Causa limeña and Ceviche



What is a very typical celebration of the country? What is its meaning or reason why it is celebrated?

One of the most important typical celebrations in Peru is the procession of the Lord of Miracles of Nazarenas. The image, which is carried on litter by a large group of worshipers, was painted during the seventeenth century by a slave originally from Angola. After two

earthquakes inside the house that this image was painted, the painting remained intact, which caused the religious authorities to create a celebration to praise this miracle. It is the main Catholic celebration in Peru, during the month of October. People who venerate this image wear purple when they are part of the procession. Within this celebration, there are other customs that are carried out, among them, the floral carpets.





Facebook: UchileBiotec
Instagram: igem_uchilebiotec
Twitter: Uchile_Biotec

Team Description

Uchile_Biotec

Our team consists of 15 people, 12 students of Eng. in Molecular Biotechnology of the Faculty of Sciences, an Industrial Designer of the Faculty of Architecture and 2 professors: a microbiologist and a chemical engineer, all from the University of Chile. This year we will participate in the iGEM competition as the sole representatives of our University and also of our country.



Project's field
Environment
Project's Name
Tenzyme Vilu



General description of the project

We are developing a biosensor of marine toxins associated to the red tide. Our biosensor consists of an "Aptazyme" formed by a DNAzyme that has peroxidase activity, an aptamer that recognizes a ligand that in this case is the marine toxin and a linker. The binding of the toxin to the aptamer causes a conformational change of the molecule catalytically activating the DNAzyme, then allowing in the presence of hemin the oxidation of a compound called ABTS which in its oxidized state produces a blue / turquoise precipitate. The ultimate goal is to have this lyophilized detection system inside a device, so that anyone who wants to know if any seafood sample is contaminated, will only have to rehydrate it to use it in situ.

How does your project relate to the current situation in the country?

The Red tide is one of the main problems associated to miticulture that our country faces. In 2016, one

of the most terrible catastrophes associated with the red tide occurred in southern Chile, which affected and continues to affect thousands of people who live off seafood extraction. The marine toxins associated with red tide can be lethal in humans consuming food contaminated with them, producing effects that include: diarrheic, amnesic and paralytic, so the detection prior fishing is crucial. With our project, we intend to avoid the use of the current detection method that involves injecting samples of possibly contaminated shellfish in mice to see if they react according to the aforementioned. For these trials, every year thousands of mice must be sacrificed, of which only 0.8% yield positive results for shellfish contaminated with toxins.

In which instances has your team interacted with another team?

We have had online meetings with other Latin American teams in which we have presented our pro-

ject to see if possible collaborations arise, as it was the case with the TecCEM team, iGEM Tec Chihuahua 2018, ColegioFDR_Peru and Hong_Kong-CUHK. In addition to this, on July we participated in a virtual meet-up organized by the iGEM TecCEM team, in which we showed in a video information about our project to different Latin American teams, as well as a group of juries experts in the subject. From this opportunity we obtained very valuable feedback for the development of our project.

What were the difficulties or obstacles that arose during the development of the project?

Our team belongs to a state university in Chile that has few economic resources. In addition, Chile unfortunately is a country that doesn't invest much in science, which is

why our biggest complication has been financing our travel to Boston in order to attend the Giant Jambo-ree. For this reason we have had to constantly organize different activities and events as well as requesting sponsorships from companies to finance both our project and our trip.

Additionally, laboratory work is often difficult due to the low quantity and quality of resources that are available and must be obtained abroad. Another obstacle we had was that the biobricks we planned to use were not able to arrive in time to carry out the corresponding experiments and share the results, so unfortunately we lost the opportunity to opt for a silver medal.



Which activities have you done or plan to do as part of human practices?

We have conducted talks aimed at children (between 2 and 4 years) and high school students to spread the word about what synthetic biology is and what its uses are, we have explained our iGEM project as well as encouraging students to think about a problem that could be solved with the applications of genetic engineering. We have also participated in ecologic fairs and forums about biotechnology, synthetic biology and transgenic foods to inform and educate communities in more rural areas of Chile. In the month of July we traveled to Chiloé, an island located 1200 km from Santiago (city in which we studied). This island in the south of



Chile has been one of the main places affected by the phenomenon of the red tide, and in addition the great majority of its inhabitants live from fishing. We organized this trip in order to collect information about the reality that exists there when there is the phenomenon of the red tide and about the concerns of the people who fish, and then adapt our project to the needs of the main future users; artisanal fishermen.

Tourist information

Our team studies in Santiago which is the capital of Chile. The best time to visit Santiago is between September and December because the climate is pleasant and the days are mostly sunny. You can do many entertaining things in this city, such as going to “fondas” during the month of September and consuming empanadas, sopaipillas and Terremotos. You can also visit different museums, parks and hills such as Santa Lucia or San Cristobal,



which has a zoo and a cable car. It is highly advisable to visit for a couple of days Viña del Mar and Valparaíso, two cities of the fifth region that are approximately an hour and a half way from Santiago. Viña del Mar is famous for its beaches and beautiful flower clock while Valparaíso is known for its hills and colorful houses as well as quite original murals. Being in the fifth region, a must is to eat fried conger with french fries or Chilean salad.



Favorite typical food of the team:

Empanadas de pino, pastel de choclo, humitas with tomatoes.



A very typical celebration and its meaning or reason why it is celebrated

An extremely important date for Chile is September 18th, the day on which the first national government meeting is commemorated. During the week of the “dieciocho”, the patriotic celebrations are celebrated in the fondas or ramadas throughout the country, to which the people are going to have a good time, dance cueca,

participate in typical games like “the trompo “,” The rayuela “,” the emboque “,” the palo ensebado “ among others and to enjoy typical food such as empanadas, anticuchos and sopaipillas accompanied by chicha or terremoto that are traditional Chilean drinks. Many people also instead of going to these events celebrate with barbecues, typical food and cueca in their homes.



Libro que recomiendan

Luces al fin del mundo and Ciencia Pop. We recommend these books because they divulge what science is to a non-specialized public. Both respond to quite frequent questions that arise when speaking about science in a very easy way to understand besides telling little-known stories.



Sopaipillas with pebre

Ingredients:

½ kg of flour without baking powder

½ kg of pumpkin cooked with salt
100 g butter

½ liter of oil for frying

Place the flour in the form of a volcano (with a space in the center). At the center the pumpkin is placed and passed through a sieve (it is very important that the squash remains hot).

Add the melted butter to the center of this volcano and combine all these ingredients.

Once all the ingredients are well incorporated, leave the dough covered with a cloth so it does not cool. Take out pieces of dough and grind over sifted flour on a surface until the dough thickness is between 5 and 7 mm

Then cut with a round cookie cutter mold (if it does not have an ideal diameter of 8 cm).

Once you have the dough cut, prick with a fork at least three times, ensuring that it crosses the dough. Lastly, fry the dough in boiling oil

until brown on both sides, remove with a skewer and let stand on absorbent paper to remove excess oil. For the pebre:

Chop tomato, onion (or chives) and cilantro.

Mix everything with salt, oil, garlic and a balsamic vinegar to taste.

Serve pebre over the sopaipilla and enjoy.

Leisure

(Activity and meme)



CARD GAME: "DONKEY FACE"

Objective:

All participants must be without cards except one who will be the "donkey face". In the game there are no winners, but a big loser.

Before starting the game:

A total of 9 cards must be dealt to each player. Three of them are placed on the table face down, three on the table face up and three in the hand.

In the center of the table you must put a deck of cards face down and a card adjacent to the pile where the players will be throwing the cards. Before starting, players can exchange the cards of their hand with the 3 cards on the table faced up as appropriate.

The first turn will be held by the person to the right of the person who distributes the cards.

Special letters:

7 → with this card the next player will have to throw a card less than or equal to 7.

10 → with this letter the pile "burns"

J → with this card the turns change to the opposite direction.

2 → this is the "wild card", that is, it replaces any card.

A → is the biggest card in the game.

Joker → if someone throws this card the player, on the next turn will have to take the pile that is in the center.

How to play:

Each player will throw cards equal to or greater than the one in the center next to the deck and will draw a card from it, so that each player has at least 3 cards in hand until there are no more cards to draw.

Each time a player does not have cards to throw in a turn, he/she must take all the pile of the cards that are face up next to the deck.

If the players throw 4 cards of the same number, the pile "burns", this means that those cards are eliminated from the game and nobody takes them.

Once there are no more cards in the deck to draw, players must throw the cards they have face up on the table. If you do not have options that help you, you will have to take the cards from the pile.

Once all the cards of the hand and the cards of the table face up, they will have to throw the cards that each one has upside down without knowing what they are.



ACKNOWLEDGEMENT

This magazine was created for informative purposes and with the collaboration of the Latin American teams that are participating in the iGEM 2018 competition.

Once the competition is over (after the “Giant Jamboree”), our goal is to publish a special edition focused on what was iGEM 2018. With the creation of iGEM LATAM we hope there is a continuity through the years and that iGEM Latin America can have day is a great interdisciplinary network of collaboration between the Latin American teams that participate every year in iGEM.

Uchile_Biotec TEAM



TEAMS



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