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THE FIRST SCIENTIST AND ENTREPRENEUR, DR. CIHAN TAŞTAN, WHO STORES DIGITAL DATA IN DNA IN TURKEY: FUTURE OF GENE THERAPY AND CRISPR GENE EDITING

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TURKISH CUISINE
CULTURE: GAZIANTEP
CUISINE

...

Hitit University researchers produced bacterial cellulose from microorganisms as an alternative solution to increasing costs on paper.

THEY PRODUCED BACTERIAL CELLULOSE BECAUSE OF INCREASED PAPER COSTS



The faculty members of Hitit University Molecular Biology and Genetics Department produced bacterial cellulose from microorganisms as an alternative solution to increasing costs in paper production within the scope of the studies for the production of domestic and national products and the development of patented products.

Molecular Biology and Genetics Faculty Member, Assoc. Prof. Gülçin Alp Avcı and her team succeeded in obtaining a highly mechanically strong, biodegradable cellulose from bacteria isolated from fruit wastes.

CELLULOSE IS AN ECONOMICALLY CRITICAL PRODUCT!

Pointing out that cellulose has a wide usage network, Assoc. Prof. Gülçin Alp Avcı said that cellulose has a very important place in the country's economy. Pointing out that there has been a price increase in the

paper industry as in many sectors recently, Assoc. Prof. Avcı drew attention to the intensity of the use of cellulose in products or packaging in many sectors such as food, agriculture, animal husbandry and cosmetics. Stating that cellulose is very common in industry and pharmaceutical industry, Assoc. Prof. Avcı reminded that cellulose is mostly used in paper industry.

Explaining that the searches for obtaining cellulose shifted in different directions due to the increasing costs, Faculty Member Avcı said: "Cellulose production has been carried out for many years. Cellulose is one of the materials found mostly in wood or plants. While wood yields 40 to 60 percent efficiency in terms of cellulose production, obtaining cellulose from plants requires a very energy-consuming, multi-step method and cost. We work with microorganisms. We know that there are microorganisms in every

moment of our lives. Based on microorganisms, we asked why we don't produce cellulose from them and we started out to find the best quality".

BACTERIAL CELLULOSE TECHNOLOGY DATES BACK TO THE 1950S

Explaining that the idea of bacterial cellulose production is not a new idea, and researchers started studies in this field in the 1950s, Avcı said: "The important thing is to discover the most productive microorganisms. Microorganisms can be found everywhere in nature. Especially cellulose-producing bacteria are very valuable for us. Our country also provides an advantage in this respect due to the fertile soil it has. Especially the fruits that we name rotten or waste, or the molasses that we know as sugar beet waste, are very beautiful living spaces for such bacteria. We are investigating the cellulose production of microorganisms we

obtain from those. For the moment, there are good bacteria we found. They can produce significant amount of cellulose. Our goal is to increase the cellulose production of these microorganisms. We use different carbon sources to increase. We try to increase the amount of cellulose we produce by making them complex using different carbon sources.

WHAT ARE THE ADVANTAGES OF BACTERIAL CELLULOSE?

Making a statement about why they used microorganisms in cellulose production and the differences and advantages of this, Avcı said: "First, we can produce cellulose from microorganisms in a shorter way. Bacterial cellulose also has advantages, and also has a smooth fiber structure. Water holding capacity is quite high. It is mechanically strong and biodegradable. We can

produce in a short time and the steps required to process bacterial cellulose are much shorter. This provides great advantages in reducing costs. Since the usage area is quite wide, it is very important for us that the manufacturers shift to this area. Nowadays, when national and domestic production is emphasized in our country, our producers can take steps to put bacterial cellulose in the market. For this, they can put into practice the bacterial cellulose in cooperation with universities and research centers. We can use the cellulose we obtain from bacteria in two forms. First, we obtain it statically. We can get it flat like an A4 paper. We can write on it, we can color it with food dyes. The other is that we can produce it mechanically, like cotton. I think this raw material can also be used in the paper and pharmaceutical industry. Depending on the purpose of use, every sector can benefit very well from this".



TURKISH NEUROLOGIST DISCOVERED A

NEW DIAGNOSTIC PROCEDURE

One of the most common causes of genital and pelvic pain, "Pudendal Neuropathy", also known as "Pudendal Nerve Jam", is a problem in every 15 people in our country. However, due to the difficulty of the diagnosis and the fact that many physicians are not familiar with the subject, patients may have to live with difficulties for years without diagnosis. Thanks to the new diagnostic method developed by Neurology Specialist Assoc. Prof. Burcu Örmeci, the diagnosis can be made much faster and more accurately. Thus, it is possible to proceed to the treatment without wasting time.

A problem similar to wrist nerve compression, known in the community as carpal tunnel syndrome, can occur in the Pudendal nerve, which is responsible for the genital area. This problem, which manifests itself with problems such as pain especially with sitting in the genital area, sexual function problems, urination or incontinence, is often confused with urinary tract infections or prostate inflammation. Therefore, patients may have to continue living with pain, despite the antibiotic treatment they have received for months. It is very important to diagnose in time, as pudendal nerve compression can have results that can take the person from the society to the point of abstraction as well as physical problems.



**TURKISH
SIGNATURE TO
THE DIAGNOSIS
OF PUDENDAL
NERVE
COMPRESSION,
ONE OF
THE MOST
COMMON
CAUSES OF
GENITAL AND
PELVIC PAIN.**

PATIENTS' QUALITY OF LIFE DETERIORATES

This problem, which occurs especially in women who have given too many births, can start suddenly due to heavy lifting, reverse movement, falling or a heavy sports activity, and may also occur gradually over time. Assoc. Prof. Burcu Örmeci, who says that the most prominent feature of the pudendal nerve compression is the pain sensation that the patient experiences while sitting, gives the following information about the problems experienced by the patient,

"Pain caused by pudendal compression is usually seen near the nerve. Patients talk about the sense of alienation in the vagina and rectum. However, they complain of pain during bowel movements, unbearable pain due to pressure from urination (especially in constipation). The pain that is felt less in the morning hours but increases during the day is described as burning, tearing, electrifying and stinging like a sharp knife. It is not accompanied by itching or loss of sensation. In such a table, it is necessary to suspect that a different problem exists. In addition, the sense of pain in the hips while sitting but not in every patient, pain that spreads to the sciatic nerve area and does not respond to treatment, frequent urination, pain

during sexual intercourse especially in women, are among the supporting supportive findings".

Patients with pudendal nerve compression cannot perform simple daily activities such as driving or cycling. In short, as the quality of life of the patients deteriorates, they have difficulty in doing the activities required by daily life.

CANNOT BE DETECTED BY IMAGING METHODS

Different methods, from laboratory findings to imaging, are used for the diagnosis of pudendal nerve compression. However, since the underlying cause is not found most of the time, the patient can be directed to receive treatment in this direction, considering that the source of the problem is psychological. Assoc. Prof. Burcu Örmeci, who says that it is very difficult to perform electrical diagnosis methods (such as EMG, SEP) as the nerve passes deep, gives the following information: "The pudendal nerve is located both on the left and the right side of the genital area, but neuropathic pain is usually seen on one side or more on one side. Since the evaluations have been carried out so far in a way to evaluate the midline, even two nerves, at the same time, the diagnosis could not be made because the problematic

or less problematic nerve covers the findings of the problematic nerve. In addition, although pain appeared while sitting, examinations were being made by having the patient lied down. This was preventing the problem from being detected".

THE DIAGNOSIS METHOD WAS ALSO ACCEPTED INTERNATIONALLY

Explaining that they have started to evaluate the two nerves separately with the electrical diagnosis method they developed, Assoc. Prof. Burcu Örmeci continues her words as follows: "We have further developed the existing method. With the small electrodes we placed on the right and left, we managed to evaluate the two nerves separately. Thus, we succeeded to determine whether there was compression in the unilateral or bilateral Pudendal nerve. We also succeeded to shoot, not while in laying position, but also in a sitting position which is considered that the pain is most severe. Thanks to this, diagnoses that could not be made for 3-4 years in the past can now be made faster. This method, which we use as a standard diagnostic method, was also accepted by international authorities".



TURKISH COFFEE FOR 40 YEARS OF SAKE



TURKISH COFFEE, WHICH IS ON THE UNESCO CULTURAL HERITAGE LIST, LEAVES ITS TASTE AND FRESHNESS FOR A LONG TIME. IT IS SOFTER, AROMATIC AND INTENSE THAN OTHER TYPES OF COFFEE. IT IS QUITE EASY TO DISTINGUISH TURKISH COFFEE FROM OTHER COFFEES WITH ITS UNIQUE TASTE, GROUNDS AND FOAM.

According to legend, one day, a Greek ship captain berthed his ship to the harbor and then went on a trip in Üsküdar, Istanbul. While he is walking around, a coffee vendor from Üsküdar invited the captain to his shop and offered coffee. The two moved into a nice conversation. The time to go, the captain said goodbye to the coffee shop and sailed to the sea. 40 years passed by. The Greeks made a big revolt and kept the Turks they captured as prisoners, and the coffee maker from Üsküdar was also captured in this turmoil. His eyes met with a pair of eyes in those moments when he thought that he would die in the last moments of his life as a prisoner. Despite the 40 years passed, they immediately recognized each other. The Greek Captain immediately rescued the man from Üsküdar and freed him. This is the story behind the "Forty Years Sake" that we often use.

Turkish coffee culture and tradition dates back to the 16th century when coffee began to be served in coffeehouses in Istanbul. The tradition has two famous aspects that make its taste unique and contribute to socialization.

As a type of beverage, Turkish coffee has special preparation techniques, and these techniques, which date back many years, are still used today. Traditional methods used in the preparation of coffee have led to the development of special tools such as coffee pot,

cup, mortars and silverware. Thanks to its time-consuming preparation techniques, Turkish coffee leaves its taste and freshness for a long time. It is softer, aromatic and intense than other types of coffee. It is quite easy to distinguish Turkish coffee from other coffees with its unique taste, grounds and foam.

Turkish coffee is not just a drink, it is also a social tool that brings together cultural gaps, social values and beliefs to socialize. The socialization role of Turkish coffee is based on the opening of the first coffeehouses with their remarkable decorations in Istanbul. Coffeehouses were the places then where people still drink coffee, chat, share news, read books, and socialize. Tradition is a symbol of hospitality, friendship, kindness and fun. All this is stated by the famous Turkish proverb "A cup of coffee has a forty years of sake". This phrase shows how important coffee is in Turkish culture and how much it has got into Turkish culture.

Turkish coffee culture is practiced by every member of society in Turkey. Especially families, pottery makers, master-apprentices in coffee shops, workers, coffee grounds vendors deal with this tradition. In addition, tourists visiting our country see this tradition as a symbol of the Turkish lifestyle. This tradition is seen by all Turkish society as a part of cultural heritage and shared by individuals from all cultural and intercultural

levels. Since its introduction to the Turkish community in the 16th century, coffeehouses have been opened even in the smallest settlements. This is an evidence of the increasing demand of Turkish coffee from past to present. It is almost impossible to imagine a Turkish house without one or more coffee sets. In fact, unlike other beverages, Turkish coffee is perceived as a symbol of the Turkish lifestyle rather than the desire of coffee drinkers and those who practice tradition. For this reason, Turkish coffee and tradition provide a strong social interaction among individuals from all levels of Turkish society.

The knowledge, talent, expertise and ceremonies regarding Turkish coffee culture and tradition are informally preserved by all members of the family, through mouth-to-mouth spread, observation and participation. A person born in a Turkish family naturally learns how to prepare Turkish coffee from previous generations and adopts it as an element of the Turkish lifestyle. In addition to the family, coffeehouses as a cultural distance provide an environment where this tradition is professionally transferred. Historically, coffeehouses are indispensable for this tradition, as coffeehouses are far before than the domestic consumption of coffee in homes.

The actual way of preparing coffee requires many and very detailed

steps and skills. First of all, freshly roasted quality coffee beans (optionally) are ground in a mortar or grinder until they become powdered. Then, according to the taste, the coffee, the cold water and the sugar are put in the pot. Coffee is placed on the stove and cooked until foam appears on its surface. Finally, it is served with a glass of water and Turkish delight. Achieving a good flavor requires some skills, such as the roasting type and degree of coffee. It is very important to roast all the coffee beans equally and wait a little.

The method of preparing Turkish coffee is learned and maintained by families and coffee houses, without a specific promotion strategy, which is a sign of general consumption and cultural value. With its deep influence in Turkish life style, Turkish coffee plays a central role in culture as a sign of hospitality and friendship. To show special respect to special guests, coffee is served more attentively and with special cups than those used in daily life.

The tradition penetrates into people from all walks of life, and, as stated in a Turkish proverb, "The heart wants neither coffee nor coffeehouse, the heart wants friendship, coffee is just an excuse", it is named an excuse for existing social relationships. Inviting friends for coffee is an indication of the need for a friendly chat or sharing daily events.



Turkish coffee has a tremendous influence on literature. Therefore, numerous poems and songs have been written to describe the functions and feelings of this tradition. The tradition also takes place in Sufi poetry, religious ceremonies, miniature crafts and paintings. Therefore, tradition supports the identity and continuity feelings of communities and groups in Turkish culture.

The fact that Turkish coffee has a certain style makes Turkish coffee original and different from the other drinks, as the person always remembers the happy moments he/she had with other people while drinking Turkish coffee. Turkish coffee culture and tradition supports cultural diversity and creativity as the values and ceremonies that surround the tradition are available to all individuals.

Since many tools such as coffee grinders, coffee cups, trays, coolers, mortars, hand mills, coffee containers, coffee pot, special containers are made of valuable materials such as silver, it distinguishes artistic value and creates original works of art, and people prefer to display them in their private collections under the name of antiques.

As of 2013, Turkish coffee culture and tradition has been registered on the UNESCO List of Intangible Cultural Heritage of Humanity on the name of our country.

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THE SCREAM OF THE WORLD: AUSTRALIA FIRE

A CONTINENT IN THE MIDDLE OF THE OCEAN HAS BEEN BURNING SINCE SEPTEMBER 2019. IT WAS STATED THAT 26 MILLION PEOPLE, HALF A MILLION ANIMALS, DIED AND THOUSANDS OF SQUARE METERS BECAME UNUSABLE. THIS POINT CAUSES THE SAME QUESTION IN EVERYONE'S MIND: WHY?

The first thing that comes to mind in response is that Australia was caught unprepared to the fire. However, it is not like that, yes, there are shortcomings, negligence, but Canberra is in a better position than many countries in the world in preparation for fire. The period known as the fire season in Australia, as in the rest of the world, is getting longer. According to an article addressing the issue in the last issue of The Economist, West USA, Eastern Mediterranean, Africa Continent and Central Asia are the regions currently at risk. The Economist also points out in the same study that death and destruction in fires have increased steadily (100 people died in Los Angeles fire and 80 people died in Greece fire in 2019). Indeed, the problem is not a momentary one, but living creatures may encounter the same disaster in different countries year by year, especially in hot and dry summer months.

Australia is an ecologically unique geography. The vegetation and the 87 percent of structure are

unique to the continent. Continental vegetation and climate mean that the continent is home to animal and plant species that we do not see in the world. For this very reason, the living creatures here must be protected in a special manner.

Most of the special creatures of this special continent died by burning. Different numbers can be seen in both social and conventional media. However, experts of the area say that access to many places with fire is still unavailable, they are far behind for damage assessment, and it is difficult to give a net number, they also state: "Moreover, the ones we are talking about are of a certain size, the ants, reptiles, insects, birds are not included in the big picture. The numbers pronounced about living creatures such as horses, kangaroos, and koalas show that the apocalypse is made possible to such creatures by the contribution of human. A rhino whose horns are burnt, a koala whose paws are burnt, is beyond the numbers, even if it is not

for the whole world, but is the biggest evidence that they experienced the apocalypse. We cannot ignore the numbers, but it is necessary to think about the factors that caused this apocalypse and to search soul..."

The Australian people who experienced the fire describe the situation as "massacre, disaster, apocalypse". However, this situation offers some lessons to the whole world. The people, who have been fighting fire since April, are angry but do not give up. This fire justifies us the warning of scientists "the temperature of the world is rising" while explaining the melting of glaciers in the Arctic regions of Antarctica for years.

Increasing average temperature does not only narrow the polar regions and the life for the living creatures there, it also causes the spread of vegetation which is suitable for fire. Especially drought is the first finding that comes to mind in this sense. For example, Australia is on average 1.5.-1.7 degrees warmer than

century ago. The country broke the temperature record in 2019.

Compared to a century ago, the problem is not only limited to temperature, but the rain received by Australia has decreased by 40 percent. Now floods are experienced in Turkey in the summer months. Change in the climate makes it difficult to determine the seasons all over the world. Experts underline that the lack of rain not only creates ground for fires but also strengthens fire control. The extremely arid bushes burn like a kindling, and this makes it very difficult to keep up with control and to catch fire.

Australian scientists and some of the ecologists who observe the situation draw an analogy of "this is not a fire, but an atomic bomb" to describe the magnitude of the experience. Thousands of people are transported from their homes to other regions sometimes by navy ships, sometimes by buses.



CHAMPION SWIMMER SUMEYYE BOYACI IS NOW A WORLD CHAMPION

Sümeyye Boyacı was born on February 5, 2003 in Eskişehir. Sümeyye Boyacı, who was born without two arms and with her hip bone dislocated, gave Turkey a great pride for her success in the Paralympic European Championship.

Sümeyye Boyacı ranked the first with 45,21 points in the 50m backstroke final of the women's in S5 category at the Paralympic European Championship held in Dublin, the capital of Ireland, and brought the golden medal to Turkey, and took place among the most successful athletes of the year.

Sümeyye received her primary education in a private school and learned to write with her feet in the same school. At the age of 4.5, she started painting with her foot and achieved many successes. She made a picture for the Turkish translation of Alexander Pushkin's famous book "Golden Fish". The painting she made was presented to President of the period, Abdullah Gül, during his visit to Russia. In 2009, her tempera paintings were exhibited in Moscow. In 2014, she participated in an exhibition with her marbling art. Finally, in the Open Water Swimming World Championships held in Brazil, she became a world champion and brought honor to Turkey.

Sümeyye, the world champion with 45.92 points in backstroke competition in the championship held in Sao Paulo, Brazil on April 26-28, ranked the third in the 50-meter butterfly style and won the bronze medal.

Her success in the Paralympic European Championship held in Dublin, the capital of Ireland, filled Turkey with pride. Sümeyye Boyacı, who competed in the 50m backstroke final of the Women in S5 category, ranked the first with 45.21 points and became the first name who won a gold medal for Turkey in the tournament.



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A faculty member of Ankara University Faculty of Medicine, Department of Physiopathology, Prof. Dr. Nuray Yazihan and her team, managed to produce hyaluronic acid, which is widely used in cosmetics and adds 'moisture-retaining, anti-wrinkle' properties to skin creams, using bacteria in a laboratory environment.

DOMESTIC 'HYALURONIC ACID' PRODUCED BY USING BACTERIA IN LABORATORY ENVIRONMENT



Hyaluronic acid, which is widely used in cosmetics, aesthetic surgery, and tissue engineering, can also be produced from various animal tissues, such as shark skin, rooster comb, cattle pupils. When used in skin creams, it is known for its property to keep moisture up to a thousand times its weight in water.

Yazihan and his team worked on 'production of hyaluronic acid from bacteria', which was started by Prof. Dr. Ahmet Çabuk and his team from Osmangazi University, and produced pure hyaluronic acid suitable for use in food and cosmetics. Yazihan, who is preparing to start domestic and national production, said: "Hyaluronic acid is a very expensive substance that we constantly buy from outside. It is used as a food supplement, it is used in cosmetics, plus it has a

lot of use in medical devices and medicinal products. Acquisition methods and production methods differ according to the usage area, and this reflects in the price".

Pointing out that the hyaluronic acid produced from bacteria in the laboratory environment is more compatible with human nature than the production of animal origin, Yazihan continued: "There are also those of animal origin in the substances on the market, but when you use products of animal origin, you are very likely to encounter an allergic reaction. Plus, when there is any bacterial or other type of infection in the animal, this infection is likely to be transferred. For this reason, bacterial and purified ones are generally preferred and this is more suitable for human nature. Plus, we do not make any

genetic changes in the bacteria we use".

Expressing that they will start producing hyaluronic acid food supplements in the first 6 months of 2020, Yazihan noted that the product will be sold in a food supplement format without GMO. Expressing that the food supplement will be for those who have joint problems, Yazihan continued as follows: "When you say hyaluronic acid, beauty comes to mind, this is indispensable for women. This substance is a very important filling material for your skin. Besides, if we think about Turkey, most people have joint problems and it is very important in terms of bone health. In that respect, when it comes to food supplements, it will be a formulation that affects bone health when most people, especially women,

take it as a supplement after a certain period of time. We will make it in the form of a food supplement formulation made specifically for the joints".

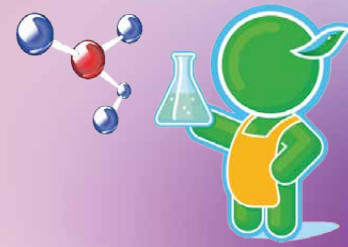
Yazihan, who managed to produce this import-dependent substance in Turkey, said that they would primarily produce it as a food supplement because they could not find the financial support required by hyaluronic acid production in the cosmetic field: "When you make a cosmetic filler, the production weight of the hyaluronic acid will change along with the molecular weight of the hyaluronic acid. Of course, this requires very serious investments. In our projects, we have actually produced those that will be used for cosmetic purposes under laboratory conditions, but unfortunately we have no chance to commercialize

them because we don't have production conditions and possibilities".

Emphasizing that the value of the substance in the cosmetic field is much higher, Yazihan continued her words as follows: "There are many cosmetic manufacturers in Turkey; creams are produced and they put this substance into creams or make supplements. We are talking about a product that has an incredible market share in the field of lip filling, under-eye filling or otherwise in the cosmetic field. If it is localized in Turkey, if suitable conditions are provided, it will become a product that will have a significant economic contribution. Dependency on the foreign market will decrease, in this case it will make a positive contribution".

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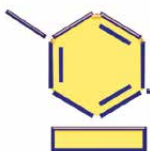
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DOMESTIC CAR OF TURKEY, TOGG, WAS INTRODUCED



THE FIRST MOVING SAMPLE OF THE DOMESTIC ELECTRIC CAR, WHICH TURKEY WAITED CURIOUSLY, WAS INTRODUCED. IT IS ALSO PLANNED TO BE OPENED TO INTERNATIONAL EXPORT MARKETS SOON.



The car of Turkey was introduced with the "Turkey's Car Venture Group Journey to Innovation Meeting" held in Gebze with the participation of President Recep Tayyip Erdoğan. "Turkey's Car", which is among the vision projects of Turkey, was originally planned to enter the market with an electric SUV in Segment C and to increase the number of models to 5 in the following years. In the project, plans for an investment of approximately 15 years consisting of 3 phases were prepared. The project, whose intellectual and industrial property rights will be fully owned by Turkey, is expected to contribute 50 billion Euros to the Turkish economy, 7 billion Euros to the current account deficit and create a direct employment for 4 thousand and indirect employment for 20 thousand people.

With the new platform, which makes TOGG's smart vehicle developed by Turk-

ish startups having foreign connections and TOGG engineers a special assistant, the car communicates with all smart devices connected to the internet and settles in the center of smart life with connection technologies. The smart car can produce scenarios that can help with many issues from the iron left plugged, internet shopping, to delivery of the shopping to the vehicle even when the driver is not in the car.

The car, which is expected to go into mass production in 2022, is also planned to open to international export markets, primarily in Europe, after 2-3 years apart from the domestic market.

CEO of TOGG, Gürkan Karakaş, said: "The rules of the game are changing in the world; the car turns into a smart device. We examined 18 companies before starting the project. We are talking about a car whose intellectual property is 100

percent ours. We will have 5 models in 15 years. Why did we choose SUV? The world's largest segment, a segment that is 95 percent imported. We plan to complete the naming process of the brand in the middle of next year. It will have two alternatives, namely 200 and 400 hp, rear wheel drive or 4 wheel drive. It will have a range of 500 km and will be rechargeable in under 30 minutes. We developed its battery from scratch. Also, the vehicle has a holographic assistant".

In the announcement made on TOGG's official Twitter page, it was mentioned "We receive a large number of messages and phone calls for the automobile both from home and abroad. Production, sales and marketing strategies are carried out meticulously. We kindly request that the persons and institutions wishing to place pre-orders follow the official state-

ments made by TOGG".

The first action video of the car, which will be 100 percent electric, recorded while passing through Osmangazi Bridge, was shared. The video featured the logo, steering wheel and overall image of the domestic car. Details were published in the Official Journal. According to the Presidential decision, the domestic automobile production facility will be established in Gemlik district of Bursa with a fixed investment of 22 billion TRY. The domestic car will have 5 different models by the year 2030 and 175 thousand cars will be produced annually. The vehicle is expected to be on the road in 2022.

Many enterprises in this center, which is home to Turkey's Automobile Initiative Group, will be the pioneer of critical domestic and national technologies.



PROF. DR. MEHMET HABERAL MADE TURKEY PROUD AGAIN

The success story of Haberal, which started with kidney transplant surgery from a living donor for the first time in Turkey in 1975, continues with the addition of new ones. Başkent University Founder Prof. Dr. Mehmet Haberal, who carried out kidney transplantation from cadaver in 1978 and liver donation from live donor not only in Turkey but also in Europe, Middle East and Africa, made a science invasion to Hong Kong in 2016 with his team of 30 people. Haberal was elected as President of the World Organ Transplant Association by 6 thousand 700 scientists from 105 countries. This was the highest point, the first step of which was taken in 1975, on the proud walk in the history of world medicine. He received the "Millennium Medal" for

the first time as a Turkish and Muslim scientist for his contributions to the development of organ transplantation in Turkey and the world at the World Organ Transplant Association's congress held in Rome in recent years.

In the International Organ Transplantation Congress TTS-2018, the 27th of which was held in Madrid, the capital of Spain, in 2018 with more than 3 thousand scientists, Haberal was officially appointed as the chairman of the World Organ Transplant Association, where he was elected 2 years ago. Prof. Dr. Haberal, who has made a worldwide name in organ transplantation, took over the presidency of the World Organ Transplant Association from his colleague in the USA, Prof. Dr.

Nancy Ascher. Haberal will carry out the presidency of the association in 2018-2020.

Haberal, who dedicated his success to Turkey, emphasized, in his statement, that Turkish physicians have the technical equipment, foresight and ability competing with the world, and stated that he is honored of sentence of the Great Leader Mustafa Kemal Atatürk "Entrust me to Turkish physicians".

Stating that all the successes he achieved actually belongs to Turkey, Prof. Dr. Haberal said: "We took over the presidency. Hereby, Turkey will not be a leader in organ transplantation only, but will also have a voice in the world".



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'BIOTECHNOLOGICAL' COOPERATION BETWEEN SABANCI UNIVERSITY AND MERCK



SABANCI UNIVERSITY NANOTECHNOLOGY RESEARCH AND APPLICATION CENTER AND GERMAN MEDICINE AND CHEMISTRY COMPANY MERCK, ACTUALIZED A SIGNIFICANT R&D AND APPLICATION UNIT IN TURKEY IN THE FIELD OF BIOTECHNOLOGIC PRODUCT DEVELOPMENT.

The opening ceremony of the SUNUM & MERCK Life Sciences Implementation Unit, which was established 351 years ago as the oldest pharmaceutical and chemical company in the world and which was put into practice by Merck, one of the leading science and technology companies, was held at Sabanci University.

Prof. Dr. Yusuf Leblebici, the Chancellor of Sabanci University; Şehram Zayer, Chairman of Board of Directors and General Director of Merck Turkey; Alpogut Kara, the Chairman of the Board of Director of SUNUM; Ron Bunschoten, the Process Solutions Europe Region Group President of Merck; and Fazilet Vardar Sukan, the Director of SUNUM, lecturers of Sabanci University, senior managers of Merck; important institutions and organizations of public and industry and many other from the sector participated in the ceremony.

In his speech at the ceremony, Sabanci University Rector Leblebici stated that the presence of centers in Sabanci University, the studies carried out and the collaborations with faculties are always among the priority issues for them.

Leblebici said "Aiming to make a sustainable contribution to the devel-

opment of knowledge and technology, our university strengthens its strength with local and international collaborations with the industry within the framework of the mission of 'Creating and Developing Together'. That we ranked the first in Industry, Innovation and Infrastructure categories in the Times Higher Education Universities Impact Rankings for 2019 that was published in the recent months is an indication of the importance we attach in industry collaborations".

"SABANCI UNIVERSITY WILL KEEP BEING A CENTER OF EXCELLENCE AND ATTRACTION"

Expressing that they are happy to continue these collaborations internationally, Leblebici said "The trust of Merck, one of the most established companies in the world, on the infrastructure and manpower of Sabanci University makes us proud. By combining our engineering R&D strength with Merck, we add another collaboration to our scientific collaborations in health and medicine".

Leblebici who stated that SUNUM & MERCK Life Sciences Application Unit could be a unit where medicine and active ingredient manufacturers headquartered in Turkey

can carry out training and development studies, and which can coordinate the activities to create the advanced and academy-based workforce that are required, said that they believe that this unit will be the source of leading ideas and inventions in the field of health and medicine.

Pointing out that another important outcome of this cooperation will be the scholarship opportunities to doctorate students to be determined from the Molecular Biology, Genetics and Bioengineering Program, Leblebici said "Sabanci University will continue to be a center of excellence and attraction with its interdisciplinary approach, carried out by our faculty members and researchers."

"WE PREDICT THAT THE CENTERS PRODUCING BIOTECHNOLOGICAL DRUGS WILL INCREASE"

Chairman of Board of Directors and General Director of Merck, Şehram Zayer, reminded that the products of Merck which celebrated its 21st anniversary in Turkey in 2019 are known in Turkey since the beginning of 1900s.

Pointing out that they focus on creating projects that add value to the country, Zayer said "We are proud

to open this center, which will contribute to biotechnological drug research and development, in cooperation with Sabanci University, one of the prestigious and leading universities of our country, and SU Nanotechnology Research and Application Center (SUNUM). Turkey's visions for 2023 clearly aims to focus on research and development in the field of health and to create an ecosystem that creates value with the contributions of domestic and foreign investment. We, as Merck Turkey, are very happy to contribute to achieve this goal".

Touching on the importance of the need for trained academicians to carry out these studies, Zayer said "This project will contribute to our country in many areas. In this center, researchers will be able to work on biotechnological product process development, production and purification. The biotechnological product research centers in our country will be supported thanks to the information transfer to be provided by Merck to obtain a GMP (good manufacturing practices). As a result, we anticipate that the number of the centers producing biotechnological drugs in Turkey will increase. One of the most important contributions of



the project is to contribute to the training of young scientists who will take part in research and development studies, together with the valuable academicians who are already working in this field”.

Zayer also stated that biotechnological drugs can provide treatment with less side effects in a much shorter time compared to conventional drugs. Pointing out to Turkey's potential to produce biotechnological drugs and stating that drug manufacturing is a challenging process requiring patience, Zayer said “Turkey started to make investments and exerting efforts in this field and now is taking progress. We will be able to see the results of these steps in the coming years”.

“IT WILL MAKE A SIGNIFICANT CONTRIBUTION TO ADVANCED AND ACADEMIC BASED WORKFORCE”

Alpagut Kara, the Chairman of Board of Directors of SUNUM, stated that SUNUM is one of the 4 centers for which a competence decision was taken in Turkey within the scope of the Law on Supporting Research Infrastructures; and that they primarily focused their know-how on nano-materials, life sciences, food, agriculture, water, environment and energy fields”.

Stating that SUNUM is at the center of research, education and innovation activities, Kara said that they are an exemplary

center among thematic research centers operating in higher education institutions with their national and international qualified research staff and the bridge between university and industry.

Emphasizing that such steps will significantly contribute to Turkey's advanced and academy-based workforce, Kara said “We signed the agreement by feeling the support we received from Merck, one of the leading suppliers of the Global Health Services and Life Sciences sector, and the deep-rooted strength and close collaboration of the host organization, the Sabanci University. In the SUNUM & MERCK Life Sciences Application Unit, not only the

biological drug and active ingredient research and development activities will be carried out in Turkey, but also the training activities will be carried out and the doctorate students will be provided with scholarship. Also, thanks to this unit, the attention of the sector will focus on SUNUM and a significant contribution will be made to the advanced and academy-based workforce that our country needs.

Kara said that the collaboration represents a very important university-industry collaboration and such kind of collaborations with foreign partners in Turkey is still significant in terms of showing that there is a center of attraction.

A MODERN LABORATORY INFRASTRUCTURE WAS ESTABLISHED FOR BIOTECHNOLOGICAL PRODUCT PROCESS DEVELOPMENT

Turkey, with the collaboration in question, acquired a modern laboratory infrastructure in terms of biotechnological product process development. By this means, the research and development of biotechnological products in Turkey are supported and setting up an academy-based workforce is aimed. Biotechnological products are produced thanks to “recombinant DNA technology”, which enables the transfer of a gene belonging to a living cell to another living cell.

This technology enables the natural proteins and hormones produced by the body to be produced by cell cultures in the laboratory. The molecules compatible with the human body produced in this way are called biotechnological products.

According to the information provided, a value amounting to 23,3 billion dollars is aimed using the innovative and advanced technology in the health field within the scope of Turkey's vision for 2023. Increasing research and development investments, creating trained human resources and increasing the number of biotechnological production centers are included in the road map.

The vision of “Turkey become a country having significant centers, manufacturing facilities and trained academicians in the field of drug and active ingredient research and development” is supported with the information transfer that is provided by Merck to Turkey thanks to the project.

Within the scope of collaboration; A joint study group will be created by the two institutions and the scholarships will be provided to doctoral students to be chosen from the Sabanci University Molecular Biology, Genetics and Bioengineering Program.



NEW DRUG IN PROSTATE CANCER

BOĞAZIÇI UNIVERSITY, COLLEGE DE FRANCE AND FRENCH BIOTECHNOLOGY COMPANY IPSEN COLLABORATED FOR A NEW TREATMENT AIMED AT THE COMPLETE DESTRUCTION OF TUMOR CELLS IN PROSTATE CANCER.

The executive director of the project is Assoc. Prof. Umut Şahin, Faculty Member of the Molecular Biology and Genetics Department of Boğaziçi University. The drug in question will be the first treatment developed in this concept in the treatment of prostate cancer in the world.

Within the scope of the ongoing project with the partnership of Boğaziçi University, College de France and international biotechnology company Ipsen, the cell with cancer is targeted to be destroyed at all by applying a new treatment method in prostate cancer. Providing information about this treatment, which is a first in the literature, Assoc. Prof. Şahin stated that prostate cancer ranks second after lung cancer in men worldwide, and that it can be treated with surgery but it is resistant to treatment at advanced stages and is prone to metastasis in early diagnosis.

Therefore, expressing that there is an important need for targeted therapy in prostate cancer, Umut Şahin said that they are developing a new treatment that will be a first in the literature in this field and continued:

"We now plan to use a new treatment method in prostate cancer, which we have used and obtained successful results before in two different types of leukemia. We developed a different drug that works based on the same treatment method. The goal of our targeted drug is to bind to the androgen receptor and completely destroy it, rather than

blocking it after binding. This is a very new treatment concept. The androgen receptor is actually a protein. The life and cycle of the cell depends on different proteins. But all proteins have a lifetime, they are destroyed after a while. This new drug also helps the cell turn to that destruction mechanism. In other words, when the drug binds to the androgen receptor, it destroys the cell, and the prostate cancer cells that depend on it also die. What is exciting here is that only prostate cancer cells die, the focus of the problem is destroyed, and while doing so it does not harm other healthy cells".

Stating that the drug to be developed will be effective on prostate cancer cells that do not respond to current treatments, Şahin stated that the drug will be the first treatment developed in this concept in the treatment of prostate cancer in the world. Stating that the preclinical studies of the drug are carried out with animal experiments and they are as productive as the second generation drugs in the market, Umut Şahin informed "In the most optimistic case, the drug will be available to humans when all phase studies are completed within 3-5 years.

As one of the scientists who have been deemed worthy of research support from Turkey within the scope of the Gilead Sciences Turkey program that has been operating in the field of biotechnology since 2013, Assoc. Prof. Umut Şahin has also received the "The Ideas put into Practice" award.

GIANT PARTNERSHIP FROM JANSSEN AND ABDİ İBRAHİM PHARMACEUTICAL COMPANY



Janssen, a pharmaceutical company of Johnson & Johnson, has joined forces with the Turkish pharmaceutical company Abdi İbrahim. Within the scope of the partnership between Abdi İbrahim and Janssen, which has carried out about 40 million dollars of clinical research in our country in the last 10 years, it is aimed to increase domestic drug production capacity and competence.

In the ceremony organized for the signature of the partnership, the CEO of Janssen Emerging Markets, Luis Diaz Rubio, CEO of Janssen Turkey, Maria Fernando Prado and CEO Süha Taşpolatoğlu, representing Abdi İbrahim, participated.

Speaking at the ceremony, Janssen General Manager of Emerging Markets, Luis Diaz Rubio, said that Turkey is an important country in the region with its breakthroughs especially in the last 10 years and the treatments it provided. Rubio said: "We are one of the companies that invest the most in R&D. We spend more than 20 percent of our global annual income on R&D investments. With our strategy of reaching the needy of innovative medicines, as Johnson & Johnson's pharmaceutical company Janssen, we have put 16 new molecules into the service of medicine since 2009. We maintain our trust and loyalty to the country with our 20 years of investments and

innovative treatments in Turkey. We are engaged in initiatives that aim to advance the government's policies towards the health needs of the country's people. The collaboration we established with Abdi İbrahim within the scope of localization is a concrete step in this direction. We will continue to bring innovative treatments to Turkey by strengthening our existing collaborations. Thanks to these new treatments, we aim to change the course of serious diseases affecting patients in Turkey.

"WE WILL INCREASE COMPETITIVENESS OF TURKEY IN THE GLOBAL MARKET"

In his speech at the ceremony, Janssen Turkey General Manager Maria Fernanda Prado said the following regarding localization policies in Turkey: "We took action to improve Turkey's domestic drug production capacity and competence and to increase its competitiveness in the global market. In our localization focus, our innovative drugs that will increase the international competitiveness of Turkey in the treatment of cancer and rare diseases will be included. I hope this new action we have taken will bring success".

"WE TARGET TO BE AN ACTIVE PLAYER IN DOMESTIC DRUGS"

Speaking at the ceremony, CEO of Abdi İbrahim Süha Taşpolatoğlu stated that,

as Abdi İbrahim, they are one of the biggest supporters of the localization in medicine and that they act with this responsibility in all of their ongoing investments as well as the investments they have implemented. Stating that they believe that localization is an extremely important driving force for Turkey to become a global player in medicine, Süha Taşpolatoğlu emphasized that they are proud to be the pioneer of this field both in intellectual stage and in practice and said:

"Abdi İbrahim, which has been operating in the pharmaceutical sector for 106 years, has a determined stance to run ahead with its technologically equipped facilities, strong human resources and investment in R&D but most importantly, our vision of supporting Turkey's goal of becoming an active player in medicine. Our target in 2020 is to grow further in the field of production service with new collaborations and to become the production base of international companies in Turkey. For this purpose, we constantly strengthen our production infrastructure and offer our standards that compete with the world to the service of the companies we cooperate with. We work with the target of being the best option for all our customers with our production environments designed specifically for the needs. The production agreement we have with Janssen today for added value drugs is a natural result of this effort and is therefore extremely important to us. We consider this agreement, which we have signed, as the first step of our long-term collaboration, and we hope to further develop this collaboration in the coming period. In the coming period, we will continue to develop similar collaborations with the mission of being the driving force in Turkey's growth targets.



According to the researches, it was observed that being able to say "no" against any undesired situation makes the person happier psychologically, while being unable to say "no" leads person to depression. First of all, one may refrain from saying no as a tendency to avoid getting into conflict with people or because we do not want to have negative effects on people. But saying "yes" to things we don't want can make us unhappy. Apart from engaging in conflict, if the person you are talking to is someone you care about, this behavior may be triggered by the an intention not to break that person and the anxiety that the relations between you and her/him will deteriorate. You may also abstain from saying no to an authority figure, for example your boss, but as a result of that, you may be under unnecessary workload and your motivation to work may decrease. Lack of self-confidence and shyness are other factors that can cause this problem. Sometimes your self, who is accustomed to saying yes, encodes that you will be a bad and selfish person when you say no, and you are focused on acceptance.

Sometimes the harm of not saying no can be as light as going to the cinema at the request of a friend, even if you don't want to. However, the price of that may lead to serious harm in your life, sometimes by leading your life with the preferences of others, such as making a decision you do not want or choosing a profession you do not want.

How can we say No? According to experts, first you have to create a list of the things you have to do because you cannot say no to see how this problem affects your life. You can analyze what it feels like not being able to say no to the things you wrote on the list and review yourself in this way. Then you can start saying no by starting with the small questions. For example, you can decline the invitation of a close friend politely and explicitly, stating that you do not want it.

Sometimes, the way you express what you say may be more prominent than what you say. Therefore, when you say no, you should be careful to say it with a clear way without any harsh temperament, explaining your feelings as much as possible.

As you begin to see that saying no gradually makes you feel happier and more comfortable, saying no will no longer be that difficult to you. After friends, you can also try to say no to people who are more difficult to say no to. Remember that your happiness is more important than anyone, and if you are happy, you will also make those around you happy.



WHY IS THAT SO DIFFICULT TO SAY "NO"?

NOT BEING ABLE TO SAY "NO" IS A COMMON PROBLEM THAT MANY PEOPLE ARE LIKELY TO EXPERIENCE DURING THE DAILY LIFE. SAYING NO MAY BE MORE DIFFICULT, ESPECIALLY IF THE PERSON IN FRONT OF US HAS CLOSE RELATIONSHIPS WITH US. IN WOMEN, THIS PROBLEM IS MORE COMMON COMPARED TO MEN.

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Gaziantep cuisine, with its kebabs, meat dishes and baklava, has become the leading city in Turkey in this field with the decision of UNESCO.

TURKISH CUISINE CULTURE: GAZIANTEP CUISINE



Gaziantep, which is one of the most important settlements of our country with its historical richness and geographical location, reveals an original cultural structure that colors the Turkish culinary tradition with its variety of dishes.

Although people who adopted here as their homeland by loving the air, water and soil hereof throughout the history have different languages, religions and ethnic origins, they have met in a common taste and have contributed to the emergence of today's rich Gaziantep cuisine culture. Gaziantep cuisine is a universal wealth that carries the traces of civilizations that have ruled its lands for centuries. Meticulousness in the selection of the ingredients used in the preparation of dishes and desserts taught as a heritage from grandmother to grandchild, the skill shown in preparation and cooking, the spices, pastes, sauces and mixtures that are used in the production of dishes and that give different taste and flavor in the dishes caused Gaziantep dishes and desserts to become famous and a taste in demand.

In Gaziantep dishes, which have more than 400 kinds of dishes, all cooking techniques including boiling, grilling, panning, saute,

roasting, saucepan, and oven dishes are used. Gaziantep received the "Local Gastronomy and Tourism" theme award of European Destination Project (EDEN) National Destination for 2015. In addition, Gaziantep Cuisine entered the Creative Cities Network List established with the participation of 116 cities in line with the decision of the UNESCO Executive Board and took its rightful place in the world cuisine.

The secret of the flavor in Gaziantep dishes, which appeals to almost everyone's taste, is not only due to the experience and skill of those who cook. The high aroma and taste of herbal and animal products produced under natural conditions in the region also have a share in this flavor. We can list some features of Gaziantep dishes as follows:

- The spices used in the meals are different. For example, in the meals with yoghurt, the safflower (saffron) or peppermint are used, in some dishes and soups the cinnamon is used, and in liver kebab the cumin is used, in ashoura the fennel is used and in rice pudding the cinnamon is used.

- While one or two kinds of sour is used everywhere, seven kinds of sour are available and used accord-

ing to meal in Gaziantep cuisine. Lemon, lemon salt, sour grape, sour grape molasses, sumac powder, sumac sour, pomegranate syrup. For example; Sour grape is used in okra, plump in wrapped, pomegranate syrup in stuffed cabbage and beet, and sumac extract in the watery salad.

- Fresh garlic, which is both healthy, tasty and appetizing, is used in many dishes. So much so that there is a meal called "garlic meal" alone or a horse bean pan in which it is added in half.

ANTEP KABABS



Kebab varieties, which are among the first famous dishes that come to mind when Gaziantep cuisine is mentioned, are made in 32 types including loquat, vegetable, quince, apple, chervil, bagel, eggplant, cauldron, pumpkin, Kilis, sour, mushroom, yoghurt and quince and meat stews.

While 26 kinds of meatballs are available in the cuisine, there are 27 kinds of rice, 15 kinds of stuffing, 26 kinds

of meat dishes, 15 kinds of pickles and 22 kinds of halva. Yoghurt dishes, which have a considerable place the Antep cuisine, green almond meal, forest, broad bean, meadow saffron meal, pea, apple meal, bean, pumpkin, meatball, mushroom, potato, onion and soup made with chickpeas and small mince dumplings are the first dishes that come to mind.

ANTEP BAKLAVA AND KATMER



An excellent taste of plenty of peanuts and cream that is consumed in the mornings and on weekends in Gaziantep. Katmer dessert, a flavor unique to Gaziantep, is as old as baklava. According to some rumors, this dessert type comes from the Armenians and is estimated to have a history of 500 years. It is not difficult to make Katmer dessert, but it takes mastery to achieve its taste. This dessert, which still has an important place in Gaziantep's cuisine, is still being eaten in the breakfast after the first night of the bride and

groom for having a sweet life. Besides, a tray of katmer dessert is brought to the girl's house by the groom's groomsmen. This means an intention to have a sweet life between the families. In Gaziantep, the so-called groom's tray became popular after the groom's katmer event, but the people of Antep buy Katmer dessert to keep this culture alive. For Gaziantep, katmer is a must like baklava.

ANTEP STYLE STUFFED MEATBALLS



In Gaziantep, which is on the Creative Cities Network that includes several cuisines of the world with its meals, the presentation period has now started for local flavors. Traditionally, special emphasis is placed on the soup made with chickpeas and small mince dumplings and stuffed meatballs in Gaziantep. While meat is placed in the dough of stuffed meatballs, onions, lamb and almonds, peanuts, walnuts and spices are added to the salpicon.



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THE FIRST SCIENTIST AND ENTREPRENEUR, DR. CIHAN TAŞTAN, WHO STORES DIGITAL DATA IN DNA IN TURKEY: FUTURE OF GENE THERAPY AND CRISPR GENE EDITING

WE HAD A USEFUL INTERVIEW WITH DR. CIHAN TAŞTAN, MOLECULAR BIOLOGIST / R&D SUPERVISOR, ACIBADEM LABCELL CELL LABORATORY. WE TALKED ABOUT THEIR PROJECTS THAT HELPED THEM BECOME PIONEERS IN TURKEY IN THE START OF GENETIC TREATMENTS. WE TOUCHED UPON MANY FIELDS FROM GENE THERAPIES TO CRISPR TECHNIQUE, FROM SYNTHETIC BIOLOGY TO DNA DATA STORAGE METHODS, FROM HIDNA TO LOCAL BIO-HACKERS. WE WOULD LIKE TO THANK DR. CIHAN TAŞTAN ON BEHALF OF OUR READERS INTERESTED IN THE SUBJECT, AND WISH YOU A PLEASANT READING.

What does Acibadem LabCell Cell Laboratory do in Turkey to develop gene therapies?

Since 2003, Acibadem LabCell Cell Laboratory continues its studies especially in immunotherapies including TIL (Tumor Infiltrating Lymphocyte), CIK (Cytokine Induced Killer) cells, dendritic cell therapies, stem cell therapies, tissue engineering products and cord blood banking under the leadership of Prof. Dr. Ercüment Ovalı, who has been a pioneer in Turkey in the start of cellular treatments as well as genetic therapies including transgenic CAR-T cell therapies. I have participated in Dr. Ovalı's CAR-T cell project since October, 2017. With leading of Prof. Dr. Ercüment Ovalı, Acibadem Labcell Cell Laboratory has performed the first clinical trial with genetically

modified CAR-T cells in the history of Turkish Medicine for ALL and NHL blood cancers since 2019. Acibadem Labcell team has now modified the cells received from patients using lentivirus with Labcell CAR genetic designs that can specifically recognize the cancers under special laboratory conditions (BSL3 virus and GMP laboratories). With the help of the experience in these studies, Acibadem Labcell team started new gene therapy studies for other genetic-based diseases. In the future, Acibadem Labcell Cell Laboratory also aims to be the first in the local production of genetic therapies for these diseases.

What would you say about being a scientist in Turkey? Do you find the studies conducted on science and genetics in our country sufficient?

I think in Turkey, the scientists are in search. I also believe there is a lack of goals and objectives. Being an academician or a scientist is not just finding an answer to a scientific question. Seeing the problems, turning them into questions and finding an answer and a solution to them with scientific methods are among the tasks of scientists. In other words, having hundreds of universities should show us that there are thousands of scientists who can find solutions to our hundreds of problems, invent products and let people up. For this reason, I believe that our scientists should focus on specific problems, goals and objectives. Although the funds allocated to the academy are limited, I believe that sufficient research funding has been provided to solve many of our problems.

Since 2012, researchers have started to perform genome modifications with CRISPR technique by producing synthetic and specific DNA sequences that are similar to CRISPR DNA sequences. You have actualized the project of developing CRISPR genome modification techniques in human immune system cells. What did you experience in this process?

In the first months of 2015, I was in the middle of my doctorate study. My PhD supervisor Prof. Dr. Derya Unutmaz (The Jackson Laboratory-Genomic Medicine), who wanted an emergency lab meeting, asked me to stop my thesis studies. He said that our lab's new, first priority goal is to apply CRISPR / Cas9 genome modification technology in human immune system cells. CRISPR tech-

nology was a new turning point in my doctoral thesis. Two of our scientific articles, which were carried out with the great influence of CRISPR technology, were published in the journals Nature Mucosal Immunology and Journal of Immunology.

Biotechnology, which has been in our lives for almost half a century in the industrial sense, has not only been a tool for the production of some economically useful products in nature, but has passed into a 'synthetic' revolution used to design new product combinations or processes that are not found in the nature. What do you think about 'Synthetic Biology'?

I work especially on genetic engineering, gene therapies and synthetic biology. I be-



lieve that the fields I work in, which enable the production of value-added products in many fields I call bioindustry, are better understood by our country day by day. I carry out my studies in every field that revolves around DNA, from genetic treatments that will end our external dependency in terms of drugs and ensure the improvement of many diseases at once, to the synthetic biology where we can store any size of information in DNA. In the near future, when countries enter a billions of dollars in an economic race in these fields, we should try to produce as much local know-how as we can so that our country does not fall behind in this race.

What is important in development and application of gene therapy products?

Gene therapy studies require a fully multidisciplinary collaboration including medical doctors, genetic engineers, animal study specialists etc. In addition to the need to have a team of experts in the laboratory, it is a very important chain that a team that has worked well is performing these treatments during the application and follow-up in the hospital. For this reason, it has to be managed to apply these applications clinically with the gathering of experts from different fields and our applications will increasingly continue.

Tens of cellular genetic therapy trials are carried out every year in the world. You said that more than 30 gene therapy products are planned to be on sale in 2025. Can the patients, who are considered incurable for years, be treated with this method?

The pharmaceutical company executives we hosted in a course I took in New York University at the beginning of 2013 said that although they produced drugs for many diseases, they did not do any study for some diseases. When we asked the reason of that, they said that there are very few people who can buy these drugs, that's who can afford the costs thereof, in Africa or other Middle Eastern countries in case they produce the drug. The year 2013 went down in history thanks to CRISPR technology as the golden year especially for the opening of the genetic treatment era. After that year, pharmaceutical companies have tried to produce

genetic regulation methods (CRISPR) or gene transfer methods in the treatment of many genetic diseases considered incurable. In other words, it seems that we will be hearing a lot about the people whose lives are changed with genetic treatments in the next years.

For many centuries, many people had to live with incurable genetic diseases. However, "Rare Diseases" started being treated with CRISPR and other Gene Therapy methods in the last decade. You have recently held the CRISPR genome modification technology workshop, which has revolutionized Genetic Engineering in this regard. What did you discuss there?

We strive to hold our CRISPR workshops in different cities or universities every year. Our goal is to increase the number of people who know this technique, both in academic research and in the biotechnology industry. For this purpose, we try to share the CRISPR technology experiences we have acquired abroad. In each workshop, we are especially interested in many of our friends who have a project to produce with CRISPR in mind, and we advise them on how they can achieve their goals. We also held our CRISPR workshop at İzmir University of Economics in October 2019 and we came a bit closer to our goal of reaching everyone.

Although data storage gets cheaper as technology evolves, the storage and reliability of big data requires large costs and systems. DNA, our body's main treasure of knowledge, has shaped the bioindustry to store this big data and keep it safe for decades without any other expense. By establishing a team under the name of "HiDNA", you combined your information in your field with computer algorithms and developed a personalized DNA data storage method that can be stored for many years. You have a website named <http://hidna.co/>. What can you say about HiDNA?

"HiDNA" platform technology for Encrypting, Archiving and Practical Readback of Digital Data in DNA, provides a service where the digital data that needs to be stored for long years is encrypted by storing it in DNA libraries and archived with the algorithm

we produce with DNA-cryptology approach to get them secure. The HiDNA data archive will not require additional costs such as electricity, cold room and maintenance-repair that would be required for long years for the storage of personal data, account information and health records on silicone chips. For this reason, the HiDNA project, which integrates molecular DNA biology with computer algorithms, offers a platform that combines effective encryption-storage and practical read-back units where privacy is prioritized.

"HiDNA" Platform technology for Encrypting, Archiving and Practical Readback of Digital Data in DNA is the first and only in our country. The team that formed our initiative is comprised of people experienced DNA techniques and algorithm and code writing. The team also closely follows the technologies of the future and their market shares. For this reason, the aim of the HiDNA initiative in the long term with appropriate investments and opportunities is to predict and get an effective share in the sector, while there is not a market share yet, by keeping its patents and infrastructures ready until the era of Data Storage and DNA computer technologies. HiDNA consists of web platform and DNA production-storage-back-reading stages. The prototype of HiDNA.co website has been prepared. Our prototype plan is ready for DNA production, storage and practical back reading, however investment is required. We can store our DNA archives we produce on the HiDNA platform with chemical

formulations that can store the DNAs without requiring special ambient conditions and at room temperature for up to 40 years. HiDNA, which set off with equity for the first time, has decided to take the investor tour by receiving a special jury award at the end of the Sanofi PharmUp startup program at the end of 2019. We are looking for investors who are open to long-term cooperation in order to produce the concept products we mentioned in 2020, to obtain patents and to expand our team.

You transfer samples of DNA data storage systems in a clear language. You have prepared an article titled "It Is Possible to Store 200 Million GB Digital Data in 1 Gram DNA!". We published it in the last issue. You mentioned that the usage areas of the data storage in DNA have increased considerably with the developing technology. It seems it will continue increasing. What would you say about it?

In health services, a lot of data is produced from many sources. Similarly, in the field of health, significant amounts of data are produced in institutions and organizations of various sizes ranging from a doctor's office to multi-service polyclinics, health centers and large hospital networks. However, the huge amounts of health-related data made it difficult to process by traditional data processing methods. Large Health Data includes data based on heterogeneous, multi-spectral, incomplete and inaccurate observations (for example, demographic

data as well as diagnosis, treatments, diseases, disease prevention, injury, physical and mental disorders) generated from different sources.

You have encrypted the first string of the Turkish National Anthem, following the sequences of the Turkish alphabet's DNA letters (A, T, C & G). A software is also developed for this. You are guiding not only to present ideas to your environment but also to turn that idea into a business plan and sales. What is your current goal?

We aim to be a pioneer in the development of DNA data storage and DNA-based computers by 2023 as a domestic initiative. We aim to provide technology transfer and added value in synthetic DNA biology to our country as an innovative technology in archiving digital data, in order to store text, visual, audio and account data in DNA safely and in the smallest medium for many years. In addition to extending the archiving effectiveness of digital data in DNA to hundreds of years, we also aim to be a pioneer in the field of health by using the experiences we have gained in this field together with the algorithm and genetic production retention methods we have developed. We aim to provide cost-effective technologies (without the need for electricity expense or cold storage space as in the computer data storage) with the methods we will develop with HiDNA for the practical sequencing and efficient storage of the human genome.

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