

# PANORAMA NEWS

SUMMER 2023 N°86 QUARTERLY NEWS SHEET

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## THE NEW LABORATORY ANIMAL FACILITY AT THE CAJAL INTERNATIONAL NEUROSCIENCE CENTER: ONE OF THE MOST MODERN IN THE WORLD!



We're interviewing **Juan Martin Caballero**, the Director of Animal Units at the Cajal International Neuroscience Center (CINC), located in Alcala de Henares (Madrid), Spain, about the new installation in the facility.

The **Cajal International Neuroscience Center (CINC)** has recently inaugurated its **new laboratory animal facility**

under the auspices of the Spanish Research Council. The CINC aims to create a highly competitive, multidisciplinary research space **for the study of the basic functioning of the nervous system to solve brain diseases and design educational and behavior-recovery programs.**

This new laboratory animal facility is one of the most modern in the world!

**Martin, can you give us some statistics about the facility?**

The total area of the animal facility is **six thousand**

**square meters**, including the technical floors and service areas. There are **three independent animal facilities**, each with its own separate entrance. In the breeding animal facility we have four large rooms of 125 m<sup>2</sup> each with **capacity for five thousand IVC and DVC cages**, including also **Tecniplast Change Stations**, plus a 62 m<sup>2</sup> rat room with **capacity for 1,000 Double Decker or GR900 cages**, together with a large transgenesis and cryopreservation laboratory. In the experimental and housing animal facility we have a 50 m<sup>2</sup> housing room for rodents in longitudinal studies, and 12 behavioral rooms of 11 m<sup>2</sup> each for behavioral studies.

We also have four laboratories in this area for neurophysiology tests, operating rooms, reverse cycle rooms, and three 20m<sup>2</sup> rooms for housing rodents under study. All of them are equipped with **Tecniplast Recovery Units for newly-operated rodents, and Ventilated Cabinets with temperature control** up to 30°C and regulation of the light/dark cycle. The common washing and sterilization area is ready to receive thousands of cage units and bottles daily, equipped with **a Pegasus robotized washing tunnel, an Atlantis rack washer, and a Poseidon robot** to fully process the water bottles (540 bottles/hour). In addition we have 3 large

autoclaves with six thousand liters capacity chambers, and up to five SAS systems for decontamination with hydrogen peroxide. For access to these SPF areas we have two locker rooms with four sterile air showers.

The third is a totally independent biosafety containment level three (NCB3) animal facility, with controlled access, a compulsory automatic water shower at the exit, a



biowaste to inactivate liquid effluents and autoclave and SAS sterilization equipment to decontaminate products and materials before they leave this biosafety area. Inside we have three test laboratories and a housing room **for 1,000 cages in negative pressure IVC, as well as biological safety cabinets** to handle these rodents. This whole area occupies 200 m<sup>2</sup> with another 200 m<sup>2</sup> of technical floor.

**What are the expected results of using this facility for the CINC and the main difficulties you encountered in designing and building for the facility?**

**This large animal facility will support research into the brain**, its structure and functioning, and will be used to search for therapies **to fight neurodegenerative diseases** such as Alzheimer's, Parkinson's, Autism, etc. as well as **infectious agents** that deteriorate the brain, such as prions, COVID-19, .... The main difficulties in designing and completing this large animal facility have been coordinating the works with the installations of large equipment and ensuring that everything fits together like a puzzle and works properly.

**We see you have adopted the DVC®. Can you tell us why, benefits from a LA manager point of view and expected results for a researcher point of view?**

**To have this DVC® equipment has been a fundamental aspect for me**, because in recent years and with good publications it has become clear that we must know what happens to our rodents during the night, when they are active, playing, mating, eating and fighting. When we arrive in the morning at the facility, we should have alarms about what has happened in the cages of our valuable rodents, and we should be able to go and solve them quickly.

**JOSEP SANTIGOSA**  
**GENERAL MANAGER**  
**BIOSIS, S.L.**





# REVOLUTIONIZING LABORATORY ANIMAL WELFARE MANAGEMENT: TECNIPLAST'S END-TO-END TINYML SOLUTION

The TinyML Summit 2023 Research Symposium (March 27, 2023, San Francisco) is the primary annual gathering of senior-level technical experts and decision-makers representing the fast-growing global tinyML community.



## Research Symposium - March 27, 2023

The tinyML research symposium serves as a flagship venue for related research at the intersection of machine learning applications, algorithms, software, and hardware in deeply embedded machine learning systems.

Source: <https://www.tinyml.org/event/research-symposium-2023>

**Tecniplast has developed a tiny, embedded camera project for laboratory animal welfare management that uses local monitoring and end-to-end system application. This project has several benefits, such as scaling monitoring operations, improving sterility, reducing costs, and introducing a new way of machine learning services. Tecniplast has partnered with STMicroelectronics to develop machine learning for hardware design and deployed tinyAI intelligence onto embedded boards.**



**Marco Garzola**, the Digital Innovation Manager of Tecniplast, spoke **at the 2023 TinyML Summit in San Francisco, discussing Tecniplast's interest in TinyML and providing details about the co-development work done with STMicroelectronics.**

Garzola has a degree in Telecommunication Engineering with Signal Processing specialization from Politecnico of Milan and technical responsibility for new products and PoCs (Sw/Fw/Hw) focusing on digital transformation (from Fw to cloud computing) at Tecniplast. He has published two scientific papers in relevant IEEE conferences and holds two patents.

## **Marco, why were you at the TinyML Summit?**

**The opportunity I had to address the TinyML summit at San Francisco Stemmed principally from our collaboration with STMicroelectronics:**

Tecniplast was invited as a speaker following research carried out with their AI team. Tecniplast's participation in an event of this caliber, unique at world level, was much appreciated as an example of concrete use and impact on the market.

During the course of 2020 we began as an Innovation Team to develop POC (Proof of Concept) based on vision systems (cameras) to complement the data of our current DVC® system.

The original purpose was to carry out technological scouting in order to understand any eventual pros and cons of a widely diffused solution based on this particular technology. At the time the idea was to forward the data from the cameras to the cloud and thereafter to analyse them. We very soon realized that such a solution scaled neither as regard costs nor performance.

I remember that at a conference I had chanced to meet Danilo Pau (IEEE and ST Fellow) who was presenting on behalf of ST certain AI-based solutions. He stated that such solutions could be achieved on micro controls that were much like what we ourselves were developing.

My curiosity aroused, I sought to understand more and thanks to a series of opportunities we managed to show them our particular use. Danilo and his team of students were attracted to it as a challenge. And so it was that Danilo decided to help us in developing certain neural networks on micro controls that equipped the DVC®.

In short order we managed to get exciting results, which we decided to corroborate through a number of scientific articles published at IEEE conferences.

**As of today, our innovative Tecniplast team is almost completely dedicated to AI and ML issues.** As our dealings with technology partners intensify, **I am confident that we will be able in the near future to come out with and validate scalable innovative solutions and thus fully meet our customers' needs.**

## **Can you briefly describe the application of machine learning in the DVC®?**

**The prototype we are currently testing involves the use of two low-resolution cameras which monitor 24/7 home cage activities.**

We are now, thanks to machine learning, able to pick up bottle presence, food level and cage presence with great precision – and all this at local level without having to forward great quantities of data to the cloud.

We are also testing new types of algorithms more linked to animal activity with very interesting results.

Our research doesn't stop just with this type of sensor: we've got a lot more up our sleeves. But let this much suffice for the moment.

## **Very interesting! How do you see the machine learning application in the LAS?**

The world is evolving very rapidly and when you take part in such conferences as tinyML Summit you realise we're on the threshold of a new technological evolution. Over these last few years there's been a lot of talk about ML and AI, but much of the development in this field has taken place in the cloud. This entails an outlay of energy/capital that not all markets can accept, a typical case being LAS.

This market, still highly paper-addicted, is generally loth to take on great innovations or very slow to do so.

Problems connected to costs, data privacy are surely issues that have held back certain types of technological evolution over the years. However, in my view, **the new ML solutions, which are ever more embedded in devices, will help this area to evolve more rapidly.**

**GIORGIO ROSATI**

**SENIOR PRODUCT MANAGER DIGILAB  
TECNIPLAST S.P.A.**

# THE IMPACT OF THE A.C.T SYSTEM ON WASHING EFFICIENCY AND OVERALL THROUGHPUT OF THE NEW RACK WASHER ALPHA

IWT has been a leader for cleaning equipment in the laboratory animal industry for decades, and our rack washer portfolio has always been the star. The Atlantis generation has been the benchmark among cage and rack washers in the LAS industry for years, as it has succeeded in providing the market with a set of solutions which minimize operational footprint, reduce energy and water consumptions, improve user experience while increasing throughput and general washing performance and ensuring flexibility to match various customer needs.

The recent launch of the new rack washer Alpha introduced key new features aiming to boost differentiation in the cage processing thus reinforcing Tecniplast positioning as the true innovation partner for the LAS market.



The new **Adaptive Cleaning Technology, A.C.T.**, in brief, is an innovative system providing a unique cleaning arms control combining independent vertical and oscillating movements. This feature ensures a superior coverage and targeted spraying pattern compared to traditional oscillating arm technology allowing operatives to optimize fluid-dynamic and minimize load-nozzles distance for a significantly increased mechanical wash force.

The direct spraying on all surfaces of the loaded items grants top-notch cleaning and rinsing efficiency, even when load density is significantly increased, making Alpha suitable for high-density presentation racks.

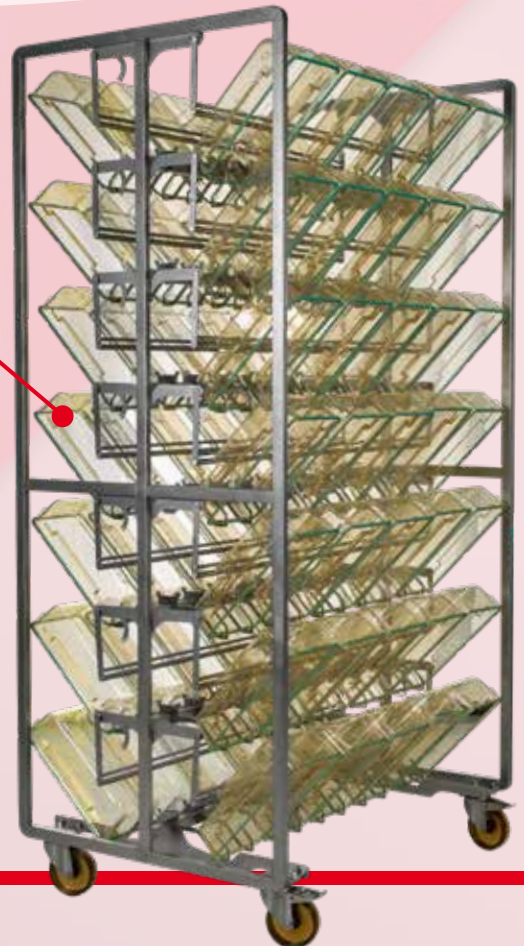
That's why IWT developed its **dedicated VHD presentation rack**, turnkey solution to achieve unprecedented throughput capabilities while minimizing utilities consumptions, introducing unparalleled density capacities, up to 154 mice cages (EM500) per load.





High-density presentation racks in combination with Alpha's water flow, pressure and empowered coverage lead to exceptional cleaning performance, making it an ideal choice for medium to large-scale operations.

Dealing with consumptions, results are even more outstanding: thanks to the enhanced water spraying pattern and the VHD presentation racks, **Alpha has been able to achieve up to 75% savings per cage**, with a water consumption of only 300ml (10oz), compared to previous generations of rack washers, and, given the new compact water tank design, over 13% energy savings.



These outcomes would be meaningless without a third-party testing company that certifies the washing and rinsing of the. Therefore, Alpha has recently been challenged in accordance with the current **AK KAB protocol** by SGS, one of the world's leading inspection, verification, testing and certification companies, and has obtained the official certificate, thus demonstrating that **Alpha fulfills the AK KAB requirements in providing efficient and effective washing, rinsing and decontamination!**



The image shows a document on the left and a logo on the right. The document is a test report from SGS, dated 06.03.2023, regarding a cage processing machine. It includes contact information for IWT S.r.l. and SGS Germany GmbH. The AK KAB logo is a circular orange emblem with the text 'AK KAB' inside. Below the logo is a red button with the text 'READ FULL NEWS' and a QR code.

**GIORGIO DALLERA**  
**JUNIOR PRODUCT SPECIALIST**  
**IWT S.R.L.**

**IWT NEWS**

## **IWT IS PROUD TO ANNOUNCE IT HAS BEEN AWARDED ISO 14001:2015!**

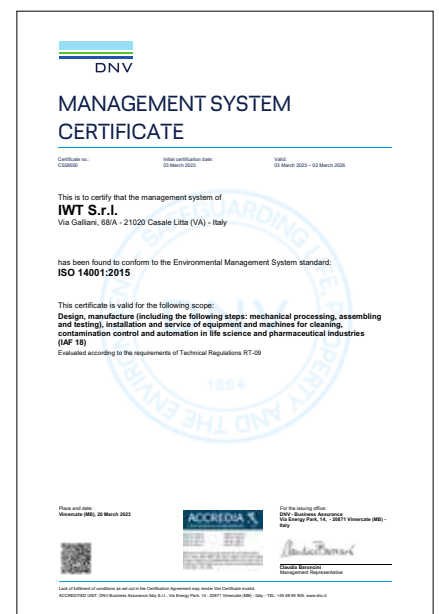
We are proud to have achieved ISO 14001 certification. This confirms our dedication and commitment to promote responsible business and green economic growth.

**We believe that a responsible green economy is the only way to meet the needs of the present and take care of the environment. We know that our future heavily depends on the health of our planet and we need to do our best to preserve it and ensure it for future generations.**

This certification comes at the end of a journey marked by a series of objectives that we have successfully achieved and which we have fully embraced. The green soul of IWT touches every aspect of our business, as we strive to create manufacturing processes and products that represent ever greener solutions.

Our 2022 was full of results and achievements in energy savings and process optimisation. We have actively reduced our global carbon footprint through our widespread recycling initiatives and our commitment to preserving natural resources and fighting against negative impacts on climate change.

All the objectives, carefully achieved, allowed us to obtain the important ISO 14001:2015 certification, which is the right recognition of our commitment to reduce our impact on the environment, always continuing to provide the high quality solutions that our customers expect from us.



The image shows a DNV Management System Certificate for IWT S.r.l. The certificate is issued for the Environmental Management System standard, ISO 14001:2015. It is valid for the following scope: Design, manufacture (including the following steps: mechanical processing, assembling and testing), installation and service of equipment and machines for cleaning, contamination control and automation in life science and pharmaceutical industries (JAF 18). The certificate is evaluated according to the requirements of Technical Regulations RT-09. The certificate is issued by DNV Business Assurance, an ISO 9001:2015 certified company.



**NEW ALPHA RACK WASHER  
REDEFINE OPERATIONAL EFFICIENCY  
AND SUSTAINABILITY**

# RWA Alpha

**+75% EXTRA THROUGHPUT PER HOUR  
-75% CONSUMPTIONS PER CAGE**

Over 1230 mice cages (EM500) per hour in fully  
validated AK-KAB cycles with only 300ml-10oz  
water consumptions per cage



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MAY 30 – JUNE 1, 2023 | PRAGUE, CZECH REPUBLIC

CELASC, Central-East European  
Laboratory Animal Science Congress



## TECNIPLAST @ CELASC 2023

Prague, May 30- 1 June, 2023

Dear Panorama News reader, in June we will be participating in a brand new and highly interesting event: the CELASC Conference.

**CELASC, or the Central-East European Laboratory Animal Science Congress**, which represents the common interests of laboratory animal science (LAS) in Europe and beyond.

The conference aims to advocate responsible scientific conduct with animals in the life sciences, with particular emphasis on ensuring animal welfare. **The conference is organized by Central-East European FELASA member associations**, including ARSAL (Romania), Balt-LASA (Baltic States), CLASA (Czech Republic), CroLASA (Croatia), GALAS (Georgia), HLASA (Hungary), HSBLAS (Greece), ILAF (Israel), and PollASA (Poland).

**During the conference, important LAS topics such as the 3Rs and welfare, communication, animal behavior, education and training, animal facility design, BSL 2, 3, 4 facilities, health monitoring, and severity assessment and classification will be discussed.**

Keynote speakers include extraordinary opinion leaders in LAS such as **Jan-Bas Prins**, Director of the Biological Research Facility at the Francis Crick Institute in London, Professor of Laboratory Animal Science at Leiden University in the Netherlands, and Honorary Professor of University College London; and **Anna Olsson**, a researcher at i3S – University of Porto, where she coordinates the Laboratory Animal Science research group.

Tecniplast will be there with our usual important presence and stand and we will organize a couple of **interesting workshops on Zebrafish and on DVC® technology.**

***We hope to see you at CELASC!***

## CELASC, Central-East European Laboratory Animal Science Congress



We had the opportunity to speak with **Jan Honetschläger**, the chair of the CELASC organizing and scientific committee.

**Jan, we can see that there is a lot of excitement surrounding this conference. Can you tell us more about how you came up with this fantastic idea and what the objective of the conference is?**

The first idea came before the FELASA congress in Prague in 2019, but the pandemic stopped the preparation. **The main goals** remained the same - to **create a meeting that would reflect our local (Central-East European) LAS needs**, enhance a culture of care in our national research communities and benefit from sharing the costs for inviting valuable speakers.

**Can you provide a brief list of the benefits of participating in this conference, given that there are speakers from various parts of the world covering interesting topics?**

We have an exciting mixture of speakers from organizing and friend associations. Together with current topics, e.g. animal welfare, severity assessment or communication with the public, it creates **an excellent environment for networking, sharing ideas and finding creative solutions** for the situations we are dealing with in our countries and institutions.

**I can't help but highlight the two keynote speakers! They are such important opinion leaders in the LAS. Can you tell us what added value they bring to the conference?**

I am excited that both Anna Olsson and Jan-Bas Prins accepted the invitation to come to CELASC. **Their experience and presentations are always very inspiring**, and I am happy that most of the organizing association members will have the possibility to meet these LAS legends in person.

**Prague: what a fantastic place in June to organize an European Conference. Can you give our readers some reasons to be in Prague in June?**

There's a lot to see in Prague. **Prague is a "3D architecture textbook"**. Romanesque chapels and cellars, Gothic cathedrals, Baroque palaces and gardens, and unique Cubist architecture make it a place with no parallel in the world. And the beginning of June is the perfect time to enjoy this tour, coffee and beer under a lovely sunny sky.

**LEOPOLDO ZAUNER**  
MARKETING & COMMUNICATION DIRECTOR  
TECNIPLAST S.P.A.



# INTERVIEW WITH AMANDA KILIAAN AND KLARA LOHKAMP

## Researchers Behind the Groundbreaking Obesity Study Using Tecniplast's DVC® System

Stefano Gaburro Scientific Director at Tecniplast, had the opportunity to interview Amanda Kiliaan and Klara Lohkamp, the last and first authors, respectively, of the exciting study on obesity and brain health using Tecniplast's Digital Ventilated Cage (DVC®) technology.

### **Amanda, We saw the article's publication; could you briefly describe the scientific objective of the work and the results?**

The main objective of our study was to investigate **the impact of obesity on brain structure and cognition in a mouse model for obesity**, and examine the possible protective role of exercise and eventual synergistic effects of exercise and branched-chain amino acids (BCAA) supplementation. **Our findings revealed that exercise helped prevent the adverse effects of obesity:** attenuated white matter loss and reduced neuroinflammation in the brain whereas cognition was slightly improved in exercising mice on BCAA. BCAA and exercise also decreased body weight and fasting insulin levels, and improved the circadian rhythm. We used Tecniplast's DVC® technology (DVC® and running wheels) to assess the impact of exercise on brain function and structure and to monitor the circadian rhythm and activity in the cages as well.



### **Klara, Are the results obtained similar to those expected?**

Yes, most of our findings are in line with our expectations. Similar to previous research, we found that voluntary exercise reduced obesity-induced loss of white matter integrity and neuroinflammation. Furthermore, the use of DVC technology allowed us to obtain precise and reliable data on the home-cage activity of the animals. We discovered that a combination of exercise and dietary BCAA supplementation improved the circadian rhythm of obese animals.

### **Amanda, Do you believe the DVC® was crucial for collecting this data and its analysis?**

Absolutely. **The DVC® system with running wheel was instrumental, allowing for precise monitoring of physical exercise using the DVC® Running Wheel over a period of 6 months. The system's advanced capabilities, including circadian rhythm tracking,**



and also accessing the activity/exercise during the active phase of the animals during the night, again during a study duration of 6 months, would not have been possible without the automated monitoring. It contributes significantly to the quality of the data collected 24/7 also because the animals are undisturbed and therefore not stressed.

### **Klara, Where do you see DVC® technology in animal facilities in 10 years and why?**

We think that the DVC® technology will be very valuable for animal research facilities in the coming years. It enables researchers to monitor mice in their home-cages 24/7, providing a reliable measure of home-cage activity and voluntary exercise through the use of DVC® Running wheels. Automated monitoring makes it possible to measure activity of animals in their home-cage environment without handling them, which is not feasible with conventional behavioral tests. **Integrating DVC® technology in future research is expected to yield new insights into various aspects of health, disease, and well-being.** In the future, we will use DVC® technology to investigate motor diseases such as stroke, by analyzing the walking patterns of stroke-induced mice that were monitored with DVC®.



**nutrients**

IMPACT FACTOR 6.706

Indexed in PubMed

Article

**The Preventive Effect of Exercise and Oral Branched-Chain Amino Acid Supplementation on Obesity-Induced Brain Changes in Ldlr-/- Leiden Mice**

Klara J. Lohkamp, Anita M. van den Hoek, Gemma Solé-Guardia, Maria Lisovets, Talissa Alves Hoffmann, Konstantina Velanaki, Bram Geenen, Vivienne Verweij, Martine C. Morrison, Robert Kleemann et al.

Special Issue  
**Mechanisms Underlying the Protective Effect of Nutrition and Physical Activity in Neurodegenerative Diseases**

Edited by  
Prof. Dr. Cristina Tomas-Zapico and Dr. Eduardo Iglesias-Gutierrez

**READ THE FULL ARTICLE**



**STEFANO GABURRO**  
**SCIENTIFIC DIRECTOR**  
**TECNIPLAST S.P.A.**

## **BEHIND THE MASTERWORK**

### **Second Episode**

In this Second Episode, Simone Casseti, Marketing Manager – Housing Solutions, Tecniplast S.p.A is showing us **“Why do we deliver air from the top of the cage?”**



**WATCH THE VIDEO**



**SKYE PREZIO**  
**MARKETING COORDINATOR**  
**TECNIPLAST USA**



## GNOTOBIOLOGY ENTHUSIASTS UNITE: JOIN TECNIPLAST FOR AN EXCITING EVENT IN FALL 2023!

The interest in gnotobiology has been increasing in recent times as more people recognize the scientific potential of these animal models. Many laboratories are now setting up units dedicated to gnotobiotic or germ-free animals. To support this growing interest, **the Modern Gnotobiology International Symposium** is being organized to provide an international overview of current scientific trends and facility management. The symposium aims to support the networking of facility managers, researchers, and trained technicians interested in **germ-free and gnotobiotic applications**. The event will include keynote presentations and interactive round table sessions covering scientific goals and best practices in gnotobiotic facilities. **The course will focus on key aspects of the microbiota of laboratory rodents**, with speakers providing practical information on how to approach, manage, and monitor these aspects. This symposium presents a great opportunity for those interested in gnotobiology to learn more and network with others in the field.



Today, we have the pleasure of interviewing **Martina Di Rico, Product Manager ISO Technology at Tecniplast S.p.A.** Martina has been instrumental in organizing the Modern Gnotobiology International Symposium.

We look forward to learning more about how Tecniplast is supporting this field and how the Modern Gnotobiology International Symposium will contribute to its continued growth and success.

**Martina, there has been a lot of attention and interest in the application of Gnotobiology in Laboratory Animal Science (LAS) in recent times. We have noticed that Tecniplast has organized a Gnotobiology Symposium. Could you please explain to our readers a little more about this exciting initiative?**

Thank you for the question, and yes, interest in gnotobiology has grown in recent years, and the scientific potential of these animal models is increasingly appreciated. Although the pandemic has temporarily impacted this field, as of now, many laboratories are ready to restart, equipping and reorganizing to set up units dedicated to gnotobiotic or germ-free animals. For this reason, we planned to organize a symposium to be held at the Tecniplast Convention Center in November this year.

The **Modern Gnotobiology International Symposium** aims to provide facility managers, researchers and qualified technicians with an international overview about products and practices for housing, husbandry and management of germ-free and gnotobiotic facilities.

**As an expert in Gnotobiology, what are your expectations for this exciting event? We noticed that it is a global event. Could you also comment on the presence of some speakers and the expected value they will bring to the event?**

Well, this is the first time we have organizing such an event, and we have decided to limit the number of participants to 30 people only. The reason behind this is that we want to encourage as much interaction and networking as possible among the attendees and speakers. **We hope that the symposium will be the first step in creating a true community, which can provide mutual support and share experiences.**

The event will be presented by a panel of international leaders in the Gnotobiotic community from the United States, Europe, and Australia. All selected speakers are experts in the field of gnotobiology and come from facilities that are different from each other in terms of equipment and SOPs. I strongly believe that they can provide diverse education, offering participants a better overview of practices and scientific outcomes, and providing interesting insights that may not have been previously considered.



**If Panoramaneers readers are interested in participating, how can they obtain further information?**

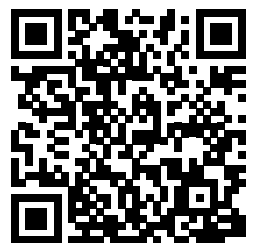
*We have launched a web page dedicated to the event, with all the relevant information.*

*Just by clicking on the following link, you will be redirected at the Modern Gnotobiology International Symposium:*

<https://www.tecniplast.it/en/gnoto-symposium.html>

*Go and check it out!!*

MODERN GNOTOBIOLOGY  
INTERNATIONAL SYMPOSIUM



**CRISTINA GAMBARINI**  
COMMUNICATION & EVENTS  
TECNIPLAST S.P.A.

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 **TECNIPLAST**  
i n n o v a t i o n   t h r o u g h   p a s s i o n

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