TECNIPLAST
innovation through passion

PANORAMA NEWS

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BRAD: BIOMEDICAL RESEARCH AWARENESS DAY

A conversation with Tecniplast Marketing Coordinator, Victoria McMahon, and BRAD Program Director, Logan France.

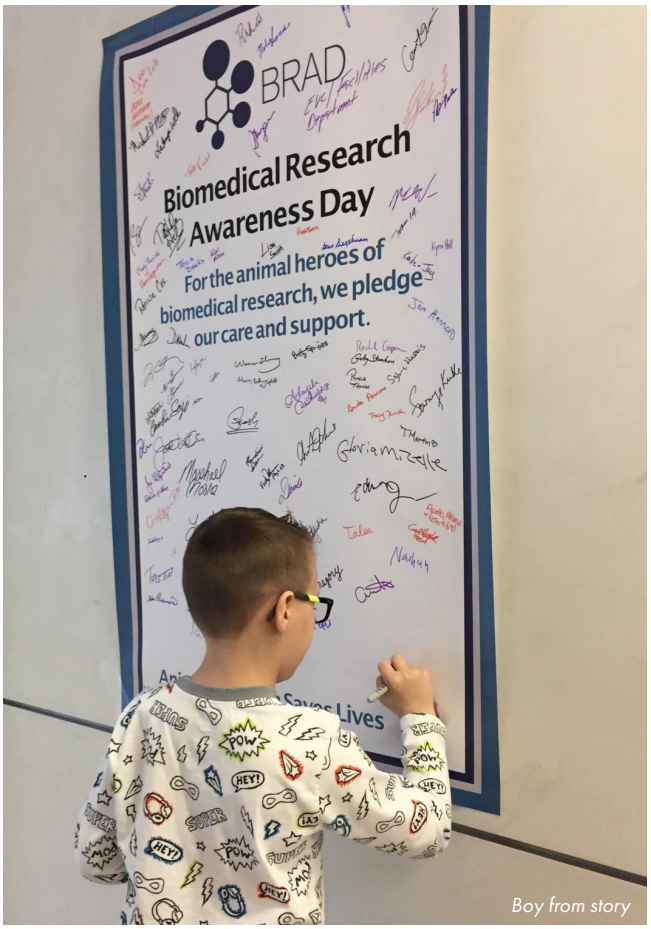
V: BRAD has been an important program at Tecniplast since before I joined the company in 2019. How did this partnership get started?

L: Tecniplast was one of the first companies to partner with BRAD, and it has been such an incredible relationship. Tecniplast really believed in our mission of providing education on the importance of animal research and wanted to help us grow and become a sustainable program. It expanded from there as Tecniplast became the official BRAD webinar sponsor, and we have since collaborated on multiple educational initiatives – from poster series about animals in vaccine development and Nobel prize winning breakthroughs to informative videos about cage design, enrichment, and more as part of our "Ask An Expert" series. We love the opportunity to work with a company that is so passionate about animal welfare,

impactful science, and education. So, as you can tell, we are so grateful for your support. What about you – how has this partnership impacted Tecniplast?

V: The partnership has allowed Tecniplast to expand on BRAD's mission and play a part in the accomplishments and advancements of Biomedical research. We are proud to offer innovative products that are designed not only for the animals, but also around the needs of the researchers and facility staff. When the design supports the research with ease, it allows the research to flourish and further advancements in biomedical research. When BRAD started in 2016, there were 20 veterinary schools. Now, over 200 participants around the world join in celebrating each year. What inspires you to continue expanding BRAD and educating the public on the importance of animal research?

L: I never could have imagined that BRAD would grow to what it is today. Institutions and individuals have embraced the program and made it a part of their culture. It's an opportunity to highlight the work they do, show appreciation for the staff supporting animal research, and educate their community on the necessary role of animals in medical progress. The growth of BRAD demonstrates the need for this type of program – those in the field of laboratory animal medicine now have an outlet to celebrate and advocate for their work. It is made possible by the individuals who devote time and effort to hosting BRAD events and companies like Tecniplast that support the program. Seeing repeat participants growing their event and new participants joining inspires me to continue providing resources to help them reach their audience, and it's a reminder that there is always another institution we can recruit to participate.



Boy from story


BRAD 2022 at University of Georgia

During a BRAD event at a hospital, a young boy stopped by with his mom who was holding a bag full of his chemotherapy drugs. After explaining BRAD's mission, both the boy and his mom signed the banner pledging their support for animal research, including research that helped develop the very drugs keeping him alive. Those stories, those experiences, the reality that the work being done is so very necessary for people and animals – that is what keeps me going. For that research to continue, we need to have public support which starts with education.

V: These stories are what make it personal for so many. Many of us are touched by health concerns personally or through close friends and family at some point in our lives. Many overlook the behind the scenes works and what truly goes into medical advancements. Overall, it has been so rewarding for us, as a company, to be a part of BRAD. How can our customers around the world participate and join in advocating for animal research?

L: We would love to have more global participants join us in celebrating BRAD.

BRAD 2022 at Emory University

This can be done by hosting an event, sharing educational materials digitally and on social media, and by tuning in to the BRAD webinar every April. We are working on translating our materials into other languages and welcome assistance in that process. If you're interested in helping, please email us. Our BRAD Team is always available to help with event planning, provide resources and materials, and to brainstorm ways to reach your target audience. We encourage new participants to read testimonials from former participants and to reach out for support and guidance. Also, be sure to follow us on Facebook, Twitter, and Instagram.

Finally, we are thrilled to have been invited by Tecniplast to participate in the Welcome Reception at AALAS 2022 on Sunday Oct 23rd. Those who are attending AALAS should be sure to stop by to see the many things Tecniplast has to offer and to visit the BRAD table for a chance to create your own lab animal to take home!

BRAD is a project of Americans for Medical Progress

Help us design the new Tecniplast "Crazy Creatures" poster series for BRAD 2023!
Vote your favorite crazy creature to be featured in the poster series and learn about their contributions to research and medical advances.

Visit the link or QR code below to vote!
[Link: https://www.bradglobal.org/crazycreatures]

BRAD-TECNIPLAST "CRAZY CREATURES"

VICTORIA MCMAHON
MARKETING COORDINATOR
TECNIPLAST USA

GNOTOBIOLOGY AND DVC®: WHAT EXPERTS SAY

Betty Theriault, John Hasenau and Stefano Gaburro were main speakers at the last webinar on Gnotobiology, discussing new trends while using DVC® System

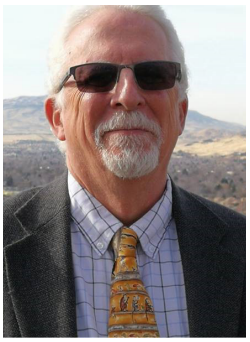
The last webinar on Gnotobiology entitled **"Present and Future Gnotobiology trends; opportunity for improving animal modelling, with the use of 24/7 bio-exclusion home cage monitoring housing systems"** was moderated by **Stefano Gaburro**, Scientific Director at Tecniplast S.p.A. and conducted by **Betty Theriault** (DVM, DACLAM) and **John Hasenau** (DVM, DACLAM). They show us the results they have attained in this interesting online event.

Stefano, as a moderator of the webinar, can you summarize the outstanding results obtained with the DVC® technology?

The Digital Ventilated Cage (DVC®) technology-based discoveries were an eye-opener for many researchers both as regards welfare and science. For instance, just to name a few the important work of Pierson and co. University of Oxford regarding how the room light can affect the locomotion in the animals 15 fold, or how the effects of cage change can persist up to 5 days.

Therefore, cage-change activities should be taken into account if experiments are to be run in the following days.

In conclusion, **leveraging stress-free technology via DVC® is changing the way experiments are conducted and it will unveil new compounds' effects, genotype behavioral repertoire, and animal discomfort.**



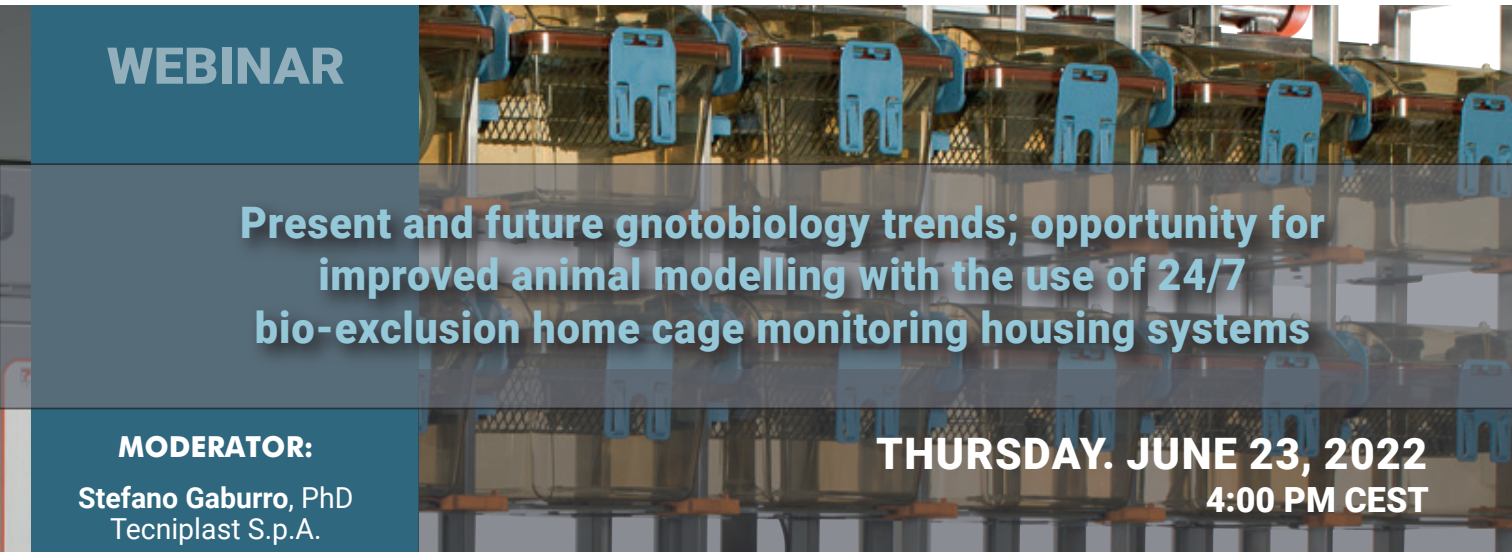
John, why do you think that this new technology is so important for the gnotobiology community?

With the use of the hermetically sealed housing system technology becoming more accepted to allow greater study diversification and increased throughput in the same foot space, there has also been the need for enhanced animal monitoring.

The addition of the DVC® technology allows a greater evaluation of the animals under study and better welfare determinations. This can help with reproducibility and rigor, and associated study data outcomes and very importantly biosecurity of the units.

Betty, Gnotobiology has an ongoing exponential increase usage in studies. Do you think that the DVC® technology can support this trend?

Trends in recent years have been towards the incorporation and use of hermetically sealed caging systems to enhance capacity and throughput in gnotobiotic operations. Inherent in the use of these caging systems is the risk for cage level contamination with each cage intervention. Additionally, cage interventions require the use of biological safety cabinet usage, and the more



investigators that may need to share these resources (hermetically sealed caging systems and biosafety cabinet equipment), the more time constraints may exist for access. **My opinion is that the integrated use of DVC® technology as it relates to monitoring germ-free or ex-germfree animals utilised in interventional studies, may help to increase availability of animal monitoring parameters, especially activity over time, while decreasing the frequency of direct cage interactions.** Consequently, any decrease in direct cage interaction can translate into **decreasing the risk of cage level contamination.** Another aspect of DVC® technology that may improve animal welfare and enhance gnotobiotic operations is the performance metric data that can be obtained from the system. Many groups utilizing hermetically sealed caging systems are balancing cage densities with extended cage change intervals. Again, the drive for this is in decreasing the frequency at which the cages require intervention and thus decreasing the frequency of opportunity to contaminate the animals in the cages. With the data on environmental quality parameters available, objective data sets may be able to be generated in support of delayed cage or bedding change intervals based on animal densities as well as microbiome status. Cage change interval informs not only study design for gnotobiotic operations, but also animal husbandry and care support for these studies.

John, what do you think about DVC® technology applied in Gnotobiology?

The integration of DVC® Technology with Hermitically sealed units offers a dual advantage in the Gnotobiology area. **The Biosecurity of the housing unit can be the first component of this addition, allowing the bedding algorithm to extend out housing change outs related to the bedding conditions.** Thus decreasing the need to open and possibly contaminate the animals in the unit. Strict adherence to SOPs to prevent any biocontamination is still the most import aspect, but a decreased need and frequency of opening the housing is a critical component in maintaining biosecurity. The second aspect is the Animal Welfare and knowledge of the animal activity in relationship to this welfare component. The true advantage of this is not having to remove the housing unit from the rack to really have full evaluation of the animals, using a 24/7 evaluation component rather than a once or twice daily check that is the current standard in most vivaria.

Betty, why do you think that Gnotobiology researchers has a wish to better understand what can be achieved through continuous measurement of animal welfare?

Many of the investigators we work with have an interest in the association of germfree mice with specific biological agents. Essentially, this bridges bioexclusion with biocontainment as many of these agents are considered risk group 2 or biohazard risk 2. In essence, merging gnotobiotic studies with biosafety type studies. Many of these studies are looking at competition for environment within the gastrointestinal tract, but studies may also be looking at pathogenesis of disease onset. In addition to our standard health scoring of these animals based on body condition, health appearance, and weight, DVC® may be able to provide insight on activity kinetics which may form an additional avenue of animal welfare assessment in these types of studies.

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

SPEAKERS:

- Betty Theriault, DVM, DACLAM
Gnotobiology : new opportunities post pandemic

- John Hasenau, DVM, DACLAM
How non-invasive home cage monitoring models can improve their translational value in Gnotobiology

Gnotobiology has an ongoing exponential increase usage in studies for many purposes. The webinar will show trends, reasons, and visions of Gnotobiology research in the coming years. The webinar will also show how gnotobiotic mouse models are being rapidly developed, and how the critical biosafe housing of these very valuable models is required. Additional non-invasive home cage monitoring of these models may improve their translational value. Monitoring of locomotor activity patterns (24/7) can be used, as diagnostic tools for the research with examples presented.
Indeed, we have seen with the last pandemic an exponential increase in study support for bio-exclusion research. Mouse models are being rapidly developed in this area, and biosafe housing of these animal models is critical. Additionally, non-invasive home cage monitoring can improve the translational value of these research models.
This webinar will be most valuable for institutions where biocontainment and bioexclusion work is being considered or conducted, and for researchers who wish to better understand what can be achieved through continuous measurement of animal welfare, based on the use of non-invasive activity monitoring. Researchers and staff of these Bio-areas may also benefit from these technological improvements through the potential for decreased cage manipulations needed for animal welfare monitoring and husbandry assessments.

Watch the webinar offline: https://my.demio.com/recording/pyL3M8Ak

GNOTOBIOLOGY: TRENDS IN CHINA

TECNIPLAST CHINA has recently organized an interesting Webinar on Gnotobiology with the contribution of Joana Bom, Axenic/Gnotobiology and Mouse Facility Manager

The Tecniplast China Team

A four-handed interview with Chenyan Lu, Marketing Manager Tecniplast China and Joana Bom, Gnotobiotic expert at Instituto Gulbenkian de Ciência, Portugal, on the successful webinar held on May 2022.

The Tecniplast China team has done a good job, reaching almost 200 participants!

Chenyan, how do you see the Gnotobiology trends in China?

Just as Gnotobiology experimentation has become a highly specialized field, the specialties for GF assistants continue to multiply.

Meanwhile we did not see a clear growth trend in the Gnotobiology during Covid period, but instead a remarkable increase in of ABSL-3 & ABSL-4 experiments has been recorded in the last two years.

Joana Bom has made a fantastic presentation. Which session do you think was most successful in the mind of TP China Customers and why?

We enjoyed nearly 2hrs of feast cooked by Chef Joana. From which we have experienced not only authority in theory but also hands-on knowledge.

Since Gnotobiology is still an emerging area for the LAS community in China, every word from Joana was valued.

Dear Joana, how do you see Gnotobiology trends in China and how do they compare with European trends? Do you see any similarities in specific evolutions?

Gnotobiology in China has started recently, but **these last few years I have seen an exponential growth and development.** The evolution is for sure different, as Chinese facilities can learn or take advantage of the learning curve that all the facilities in Europe have experienced for decades. The equipment and technologies available now are also different from 20 years ago and facilitates the everyday workload. For years, facilitate have performed gnotobiotic experiments using Isolators, clearly sub-optimal for specific procedures (e.g delicate surgeries, or repeated sample collections). **Nowadays, recent technologies like the positive pressured individual ventilated cages (ISOCage P System) facilitate the work of those performing experiments with axenic animals, by allowing cage and animal manipulation under an axenic environment on a dedicated biosafety station.**

The combined use of both isolators and ISOcages do allow for a rapid growth and evolution of gnotobiology facilities, and the research outcomes that may arise from that.

I am optimistic on this evolution.

Which topics were the most interesting to the Audience?

My presentation was related to management and technical procedures, so the focus of the questions was technical.

I received questions about contaminations, but especially about **the microbiology screening performed on the animals to ensure the axenic status**. These may be the most frequent questions I receive, and it is normal. When you start a facility and must establish SOPs, and choose the way you will manage the service, it is particularly important to make sure contaminations are known, accepted, avoided, but also solved in a methodical way. **Maintaining the animals germ-free is the most challenging task of keeping a gnotobiotic facility running, proving that high standard of quality is always kept.**

Other questions were related to specific projects that we have developed in my facility. I have shared results of a cancer research performed with a Germ-free mutant strain that mimics a spontaneous mammary gland tumor.

THE TECNIPLAST CHINA MARKETING TEAM

PANORAMANEWS MEETS SELMA TIR

A discussion on DVC® System for Circadian and Sleep Phenotyping

Selma Tir, PhD/DPhil Candidate in Clinical Neurosciences Nuffield Department of Clinical Neurosciences, University of Oxford, is the author of an important poster presented last May at the Society for Research on Biological Rhythms (SRBR) conference

Dear Selma, can your summarize your recent poster entitled "Validation of the Digital Ventilated Cage system for Circadian and Sleep Phenotyping"?

Circadian rhythms are internally generated 24-hour cycles of physiological and behavior changes that occur in all living things. They influence our sleep-wake cycles, eating habits and hormone release amongst other things, and disruptions of the circadian clock can contribute to increased risks of metabolic disease, obesity, depression and even cancer. The study of circadian rhythms and their disruption critically depend upon the study of mouse home cage behavior. **We thus investigated whether the DVC® System could effectively record locomotor activity under various light-dark cycles used to study circadian rhythms, and whether extended immobility records could be used to infer sleep.**

DVC® has been the tool to conduct the study and collect such important data. Can you comment on it?

The DVC® System is based upon widely used individually ventilated cages placed in a rack that continuously records home cage activity. **Clear, red and black IVCs equipped with individual LED systems can then be used to entrain animals to the room light cycle or individual cycles in every cage.** For example, the black cages are especially useful for the study of jet lag. This system thus provides a great alternative to the use of light-tight chambers (LTCs or 'coffins') which are routinely used in circadian and sleep research. Moreover, the availability of data in real time and on a user-friendly server makes data collection much easier!

Are final data of the study aligned with the expected results?

Home cage activity data show that **the DVC® System provides sufficient sensitivity to detect changes in circadian rhythms and that animals can entrain to various light-dark cycles using the Leddy system in the black cages.** We are still analyzing DVC® defined sleep, but are enthusiastic that this system could provide an alternative to EEG/EMG recordings for the scoring of sleep/wake behavior.

Can you comment on the DVC® technology and tell us your vision of DVC® in the lab animal industry in the short term?

Preliminary data suggest that black IVCs with independent Leddy lighting provide an ideal alternative to LTCs for circadian phenotyping, and that this would allow the simultaneous analysis of up to 60 mice in a DVC® rack. Based on 6-12 mice per LTC, this is equivalent to 5-10 traditional LTCs in a much smaller footprint and with the improved biosecurity of an IVC. **It thus has great potential for the facilitation of circadian studies.**

GIORGIO ROSATI
SENIOR PRODUCT MANAGER DIGILAB
TECNIPLAST S.P.A.

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CONTRIBUTORS
Victoria McMahon
Giorgio Rosati
The Tecniplast China Marketing Team
Leopoldo Zauner