PANBioRA Interview - 12/2019

After two years of intense research: First Prototype of the PANBioRA testing system almost finished!

PANBioRA aims at providing a comprehensive solution for the time- and cost-effective risk assessment of biomaterials for each patient in a personalised manner.17 multidisciplinary partners from across Europe have been working on this innovative testing instrument for two years now. Dr. Nihal Engin Vrana, scientific coordinator of PANBioRA is summarising the project's main achievements and will give an outlook on what to expect from the project in 2020.

Dr. Nihal Engin Vrana, since January 2018 you are coordinating the H2020-funded project PANBioRA in respect to all scientific tasks. Why is it relevant to develop a tool like PANBioRA, evaluating the patient's specific risk prior to the implementation of biomaterials?

There is an increasing number of implants being used for different conditions, e.g. tissue replacement, congenital defects or age related functional problems. This increased use of implants is consequently resulting in an increase in various complications. Although significant advances in the development of new biomaterials e.g. in the form of hybrid materials have been achieved, unforeseeable side effects of these new structures may occur. The PANBioRA testing modules will allow to comprehensively test newly discovered biomaterials, contributing to the facilitation of the validation process and their valorisation. Furthermore, PANBioRA is aiming to contribute to the establishment of personalised medicine, as for personalised implants the need of immunological fit together with anatomical fit is crucial for complication-free treatments. In short: there is a pressing need for advanced biomaterial risk assessment methods and instruments allowing to minimise side effects and enable better healthcare outcomes.

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17 multidisciplinary partners are working together to develop the PANBioRA testing system. What has been most challenging for you in the collaboration of these different partners as scientific coordinator?

In PANBioRA we have the ambitious aim of providing a generalised approach for the testing of biomaterials combining different disciplines. This requires a strong collaboration between different fields of expertise. Coordinating these multidisciplinary experts and keeping in line with the project implementation plan is a challenging task. During the first year of the project, the partners mainly worked independently on their tasks. Bringing together these different technologies now is the most challenging part of the project. But at the same time it is really great to see, how these different disciplines come together in the end to form one single product. In the process we actively transfer knowledge and benefit from each other's expertise and develop a new point of view of our respective fields; which is the most exciting part of big, collaborative projects. Face-to-face meetings or teleconferences on a regular basis help to avoid delays and mitigate risks in a timely manner. Above that, it is really important to listen to all partner's

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problems and concerns equally and seriously in order to find solutions to problems that all partners agree with. After two years working together in the projects all partners know each other quite well facilitating the work a lot.

What is your main motivation working on a collaborative research project like PANBioRA?

I have a long history with EU-funded collaborative projects. Starting as a Marie Curie ESR fellow to obtain my PhD at Dublin City University, I have ended up being the scientific coordinator of three collaborative projects (EuroTransBio "Bimot"2012-2015, FP7 "IMMODGEL" 2013-2017 and H2020 "PANBioRA" 2018-2021). European research projects set a perfect frame for a fruitful cooperation – professionally and also personally. Cooperation between different forms of organisations as well as different countries or cultural backgrounds are fostered by participating in European research and innovation projects. This not only contributes to knowledge transfer but brings us closer together as Europeans.

How will the Europeans benefit from the product developed within PANBioRA?

The PANBioRA testing module enables the development of new standards for the evaluation of biomaterials. Thus, complications and side effects after treatments involving implants and biomaterials better can be assessed prior and will be reduced. This, subsequently, will significantly decrease healthcare costs and allows better clinical outcomes. By improving treatment conditions a wider population gains access to implant procedures and in the end stay healthier. We will also facilitate the uptake of novel biomaterials which can offer solutions to problems where conventional biomaterials have fallen short.

Figure 1: PANBioRA's impact

What are you looking forward to in 2020 related to PANBioRA?

2020 will be a very exciting year for the whole consortium. Beginning of January all project partners will meet at Dublin City University and Dolmen in Ireland for the M24 partner meeting. Everyone is quite curious as a version of the very first PANBioRA prototype will be presented to the consortium. This is a big step toward the further development and integration of the whole system.

Not only from a technical point of view we are making great progress, also from a scientific point of view I'm very much looking forward to finally release the book: "Biomaterials for Organ and Tissue Regeneration. New Technologies and Future Prospects", published in Elsevier. Together with other project partners we have worked on a comprehensive overview of the current status quo of the use of biomaterials in applications related to artificial tissues and organs.

In May 2020 PANBioRA will hold a workshop session at the World Biomaterials Congress in Glasgow and thus have the opportunity to show the latest project results and luckily the first prototype to biomaterials experts all over the world.

Thank you for your time and these insights, Dr. Vrana! We are curious to learn more about PANBioRA next year!

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Dr. Nihal Engin VRANA (m) is co-founder of SPARTHA Medical SAS and its CEO. He obtained his PhD in 2009 at Dublin City University as a Marie Curie ESR fellow and his habilitation from University of Strasbourg in 2019. His major research interests are implant coatings, antimicrobial surfaces, multifunctional systels, titanium implants, tissue engineering, cell encapsulation, immunomodulation, real-time monitoring of implants and cell biomaterials interactions. He has published 75 articles in peer-reviewed academic journals (over 2300 citations, h index: 27) 8 book chapters and holds 6 European patents (1 more in progress). He edited two books for Taylor and Francis on Cell Material Interactions (2015) and BiomaterialsImmune response (2018). Another book on biomaterials and tissue regeneration is in press from Elsevier. His awards include Parlar Foundation Thesis of the Year (2006), ESB Translational Research award (2011) and 2nd Aegean R&D Patent competition 1st place award (2012), IFOS Outstanding paper award (2013), BPI i-Lab National Innovative company creation competition (2019).

For further information please visit www.panbiora.eu or follow PANBioRA on Facebook, LinkedIn, Twitter, Research Gate and check out our project video: YouTube.

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PANBioRA is coordinated by Steinbeis 2i GmbH in cooperation with 16 partners: Protip Medical (Scientific Coordinator), Dolmen Design and Innovation Limited, Biodevice Systems, Protobios, Elvesys SAS, Steinbeis Advanced Risk Technologies Institute doo Kragujevac, Steinbeis Advanced Risk Technologies GmbH, Commissariat A L'Energie Atomique Et Aux Energies Alternatives, Pro-active, Aalto-Korkeakoulusäätiö, Turgut Ozal Education SHA, The University of Nottingham, Agencia Estatal Consejo Superior de Investigaciones Científicas, Dublin City University, Institut National de la Santé et de la Recherche Medicale, Centre Hospitalier Universitaire de Liège

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