**Safe ROS amplifiers as drugs**

**European Consortium**

Funding Programme *FET-Open Challenging Current Thinking*
01.01.2019 - 31.12.2024

**FAU - UKER - SWANSEA - LNMU - CNIC - REDOXIS AB/PRONOXIS - GRCC**

Germany - United Kingdom - Ukraine - Spain - Sweden - France

**Jan 1 – Dec 31, 2022**

# NeutroCure Newsletter 2022

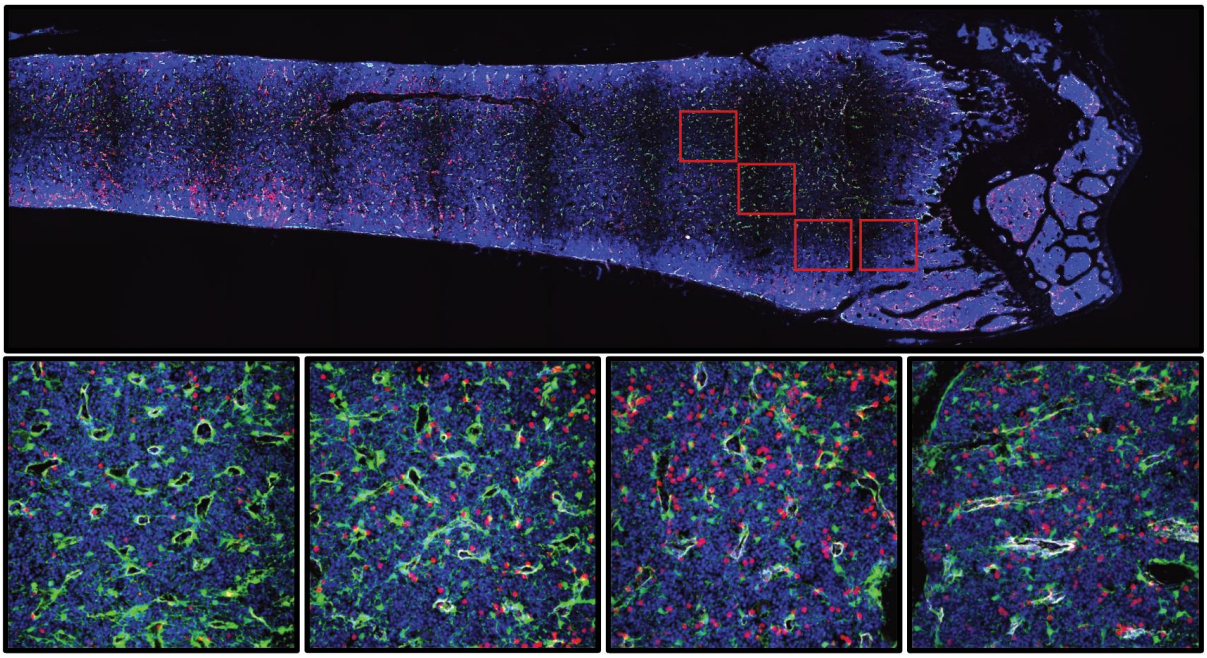
## Welcome to our third NeutroCure Newsletter.

**SUMMARY**

Our goal is to develop improved drugs and prodrugs for safe modulation of an immune system. An over-active immune system may lead to chronic inflammation and the cytokine storm phenomenon that can be observed during infection. Our hypothesis is that resolution of inflammation is dependent on the timely production of reactive oxygen species (ROS) by the first inflammatory cell on the scene, the neutrophil, to maximise clearance of pro-inflammatory debris.

During 2022, the drug development programme has been highly successful, with scale-up being achieved successfully and newly labelled compounds being made available to the consortium. These compounds have enabled effective visualisation of targeted drug delivery, for example in tumours.

Our understanding of neutrophil homing continues to develop courtesy of the fine work being undertaken in Spain – below is an image of neutrophils (red) that home back to the bone marrow and find the bone marrow stromal niche (green). These observations are pivotal to bone marrow regeneration.



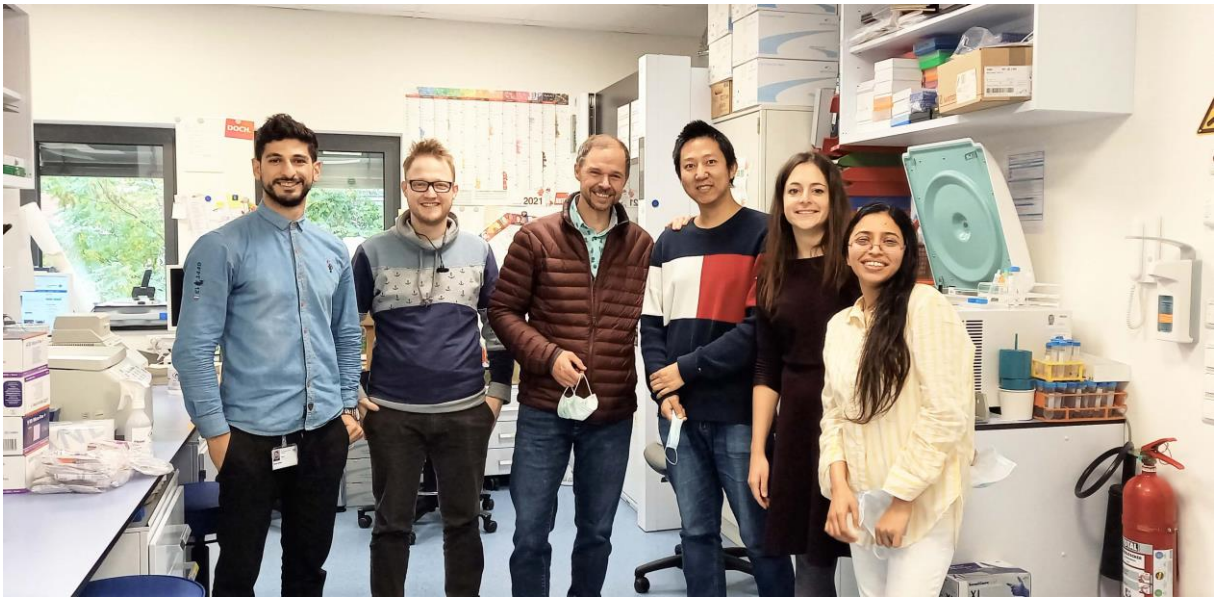
## NEWS FROM RESEARCH TEAMS

We are delighted to announce that Kanako Wakahashi, Spain, was awarded Best of American Society of Hematology (ASH) recognition for her Abstract “Neutrophils Regulate Bone Formation Via IL-1b Secretion”.

Despite the immense difficulties facing people in Ukraine during 2022 on ongoing, the team in Ukraine have had an incredibly productive year. In the summer Galyna and Rostsylav visited Andres and Itziar in Spain, and received excellent training on bone marrow neutrophils.

From our partners in Sweden, Linda Reimer Rasmusson attended the FEBS Advanced Lecture Course on the topic "Redox Alterations and Cellular Responses" sponsored by Redoxis AB on the beautiful Spetses Island in Greece.

Markus Hoffmann was appointed as Professor of Immunology at Lübeck University, Germany

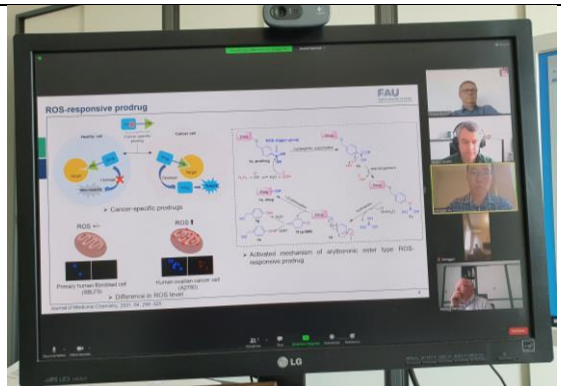


Group Picture Erlangen before leaving


People involved in NeutroCure research @Lübeck

Group picture Lübeck after arrival

Helen Griffiths (SWANSEA) was welcomed to the Fellowship of the Learned Society of Wales.




On 05.04.2022, Honggui Xu (FAU) has succesfully completed his dissertation with distinction.

From Spain (CNIC), Andres Hidalgo was named as an EMBO member in 2022


Andres Hidalgo was also recognized in a Fundación Caja Rural de Granada Award during 2022

## PUBLIC SCIENTIFIC PRESENTATIONS ON NEUTROCURE PROJECTS

Representing events are listed (overall 30 scientific presentations)

1. Kanako Wakahashi (CNIC): Oral presentation at the American Society of Hematology (ASH), "Neutrophils Regulate Bone Formation Via IL-1b Secretion"

2. A. Mokhir (FAU). International Symposium on Bioorg. Chem., 28.04.2021. Online format.

3. R. Bilyy (LNMU), **yEFIS** 1 Symposium: Shaping the Future of Immunology in Europe, November 10th & 11th, 2022

4. M. Herrmann (UKER), *13th European Lupus Meeting 2022*, 06/10/2022, Stockholm, Sweden. "Extranuclear DNA drives autoinflammation in lupus".

5. M. Herrmann (UKER), *European Lupus Day 2022*, 23/10/2022, Strasbourg, France. „Extranuclear DNA drives auto-inflammation in lupus".

6. M. Hoffmann (UKSH), *EULAR conference,* 02/06/2022, Copenhagen, Denmark. "Inflammatory tissue prioming as regulatory factor during arthritis".

7. M. Hoffmann, *European Workshop of Rheumatology Research,* 05/05/2022, Vienna, Austria. "Reset of inflammatory priming and reduction of the severity of arthritis flares".

8. M. Euler, *SFRR-E Annual Meeting – Redox Biology in the 21st century: A New Scientific Dicipline,* 16/06/2021, Zadužbina Ilije M. Kolarca, Belgrade, Serbia. "Amplification of NET formation and neutrophil aggregation for the resolution of inflammation".

## CONSORTIUM MEETINGS

In 2022, we held three formal consortium meetings on zoom to share knowledge between partners and increase opportunities for early career researchers to present their findings.

## PUBLICATIONS 2022

1. Bila, G., Rabets, A., Bilyy, R. (2022). Nano- and Microparticles and Their Role in Inflammation and Immune Response: Focus on Neutrophil Extracellular Traps. In: Stoika, R.S. (eds) Biomedical Nanomaterials. Springer, Cham. https://doi.org/10.1007/978-3-030-76235-3_6

2. Crainiciuc G, et al. *Behavioral immune landscapes of inflammation*. Nature 601(7893): 415-421, 2022

3. Gizem Özkan H, Thakor V, Xu HG, Bila G, Bilyy R, Bida D, Böttcher M, Mougiakakos D, Tietze R, Mokhir A. Anticancer Aminoferrocene Derivatives Inducing Production of Mitochondrial Reactive Oxygen Species. Chemistry. 2022 May 25;28(30):e202104420. doi: 10.1002/chem.202104420. Epub 2022 Apr 13. PMID: 3541988

4. Knopf, J.; Sjöwall, J.; Frodlund, M.; Hinkula, J.; Herrmann, M.; Sjöwall, C. NET Formation in Systemic Lupus Erythematosus: Changes during the COVID-19 Pandemic. *Cells* 2022, *11*, 2619. https://doi.org/10.3390/cells11172619

5. Schoen, J.; Euler, M.; Schauer, C.; Schett, G.; Herrmann, M.; Knopf, J.; Yaykasli, K.O. Neutrophils' Extracellular Trap Mechanisms: From Physiology to Pathology. *Int. J. Mol. Sci.* 2022, *23*, 12855. https://doi.org/10.3390/ijms232112855

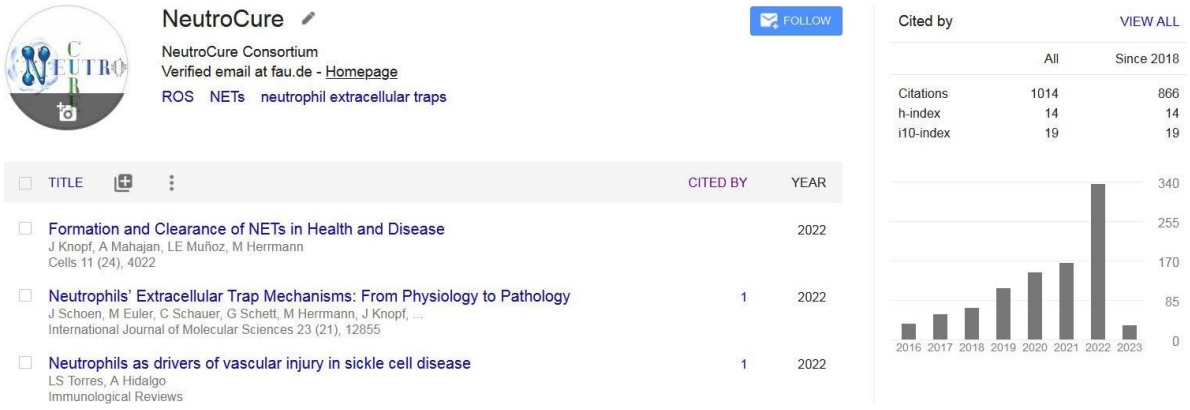
6. Torres LS and Hidalgo A. *Neutrophils as drivers of vascular injury in sickle cell disease*. Immunological Reviews 2022

7. Vitkov L, Knopf J, Krunić J, Schauer C, Schoen J, Minnich B, Hannig M, Herrmann M. Periodontitis-Derived Dark-NETs in Severe Covid-19. Front Immunol. 2022 Apr 12;13:872695. doi: 10.3389/fimmu.2022.872695.

8. Xu HG, Reshetnikov V, Wondrak M, Eckhardt L, Kunz-Schughart LA, Janko C, Tietze R, Alexiou C, Borchardt H, Aigner A, Gong W, Schmitt M, Sellner L, Daum S, Özkan HG, Mokhir A. Intracellular Amplifiers of Reactive Oxygen Species Affecting Mitochondria as Radiosensitizers. Cancers (Basel). 2021 Dec 31;14(1):208. doi: 10.3390/cancers14010208. PMID: 35008371 **Free PMC article.**

## COMMUNICATIONS

Since 2022, we have promoted ourselves on Google Scholar, a forum that enables us to gather our publications together in a searchable format and identify the teams of scholars who are citing our work. Our specific link is https://scholar.google.com/citations?hl=en&user=16tXi1gAAAAJ. The figure below shows the increase in recognition and citations of papers related to NeutroCure topics published by consortium members over the past 5 years.



# Safe ROS amplifiers as drugs

**European Consortium**

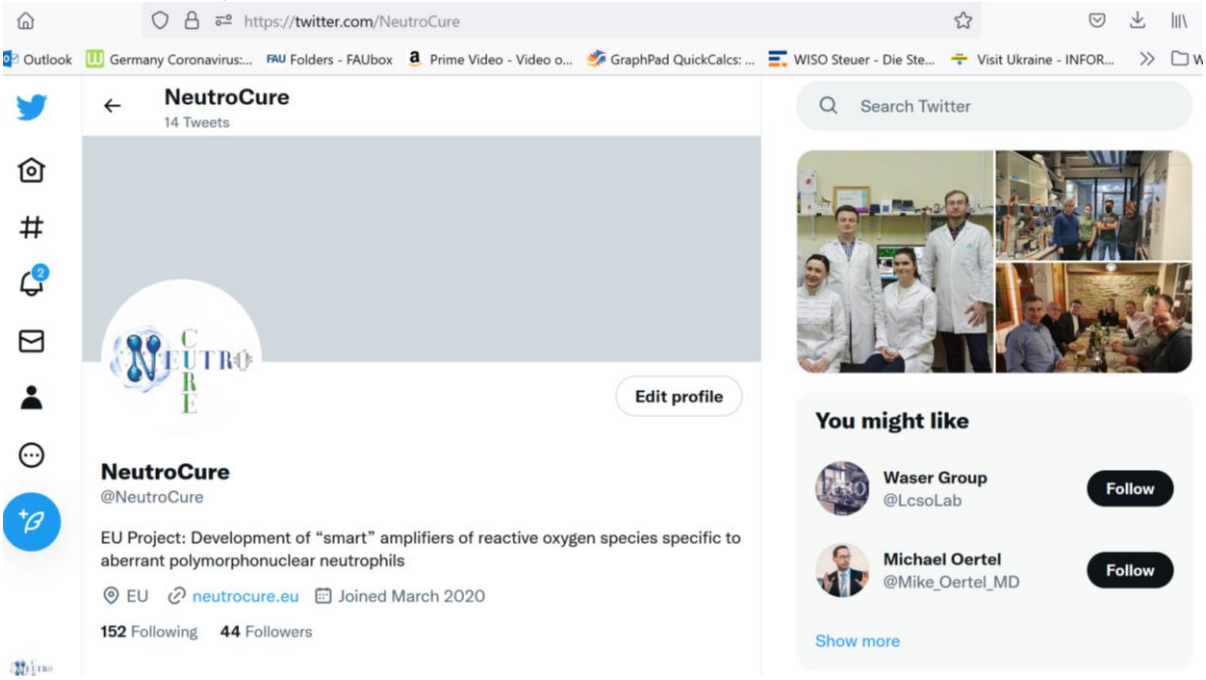
Funding Programme *FET-Open Challenging Current Thinking*
01.01.2019 - 31.12.2024

**FAU - UKER - SWANSEA - LNMU - CNIC - REDOXIS AB/PRONOXIS - GRCC**

Germany - United Kingdom - Ukraine - Spain - Sweden - France **Jan 1 – Dec 31, 2022**

We have set up a new homepage https://www.neutrocure.eu with a shorter name than our first home page, including more content and linked to other online platforms representing NeutroCure. This homepage is found by google search.


Twitter account @NeutroCure includes our newsletters and other information



## Safe ROS amplifiers as drugs

**European Consortium**

Funding Programme *FET-Open Challenging Current Thinking*
01.01.2019 - 31.12.2024

**FAU - UKER - SWANSEA - LNMU - CNIC - REDOXIS AB/PRONOXIS - GRCC**

Germany - United Kingdom - Ukraine - Spain - Sweden - France **Jan 1 – Dec 31, 2022**

Additionally, we have reserved the presence of NeutroCure at the ResearchGate platform.