

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 2020 – Oct 31, 2025**

NeutroCure Newsletter 2024/5

Welcome to our fifth NeutroCure Newsletter.

SUMMARY

Our goal is to develop novel drugs based on amplification of reactive oxygen species (ROS) for enabling an effective immune system. An over-active immune system may lead to chronic inflammation, pain and loss of function. Our hypothesis is that resolution of inflammation is dependent on the timely production of ROS by the first inflammatory cell on the scene, the neutrophil, to maximise clearance of pro-inflammatory debris.

We have adopted two distinctive ROS-amplifier compound classes which act via different mechanisms. One class is specifically targeting the fMLF receptor and the second class adopts a radical chemistry amplification of aminoferrocene. The details of specific modifications to the core structures will form the basis of future patent filings to protect the intellectual property developed within the project and to provide a commercially protected portfolio. During 2024 and 2025, we have been focused on optimising the concentrations and doses of the short-list of lead compounds to determine biological effects in primary cells and disease models.

As we have taken the translational aspects of the research programme forward, we have considered the elevated susceptibility to bacterial and fungal respiratory infections that are common in chronic conditions such as cancer, RA and CGD. These are mainly due to immune dysregulation and the use of existing immunosuppressive treatments such as corticosteroids, methotrexate, and biological agents. In this period, we have demonstrated that bacterial clearance by neutrophils is improved in the presence of Neutrocure compounds, and in addition, the removal of biofilms is also enhanced (Figure 1).

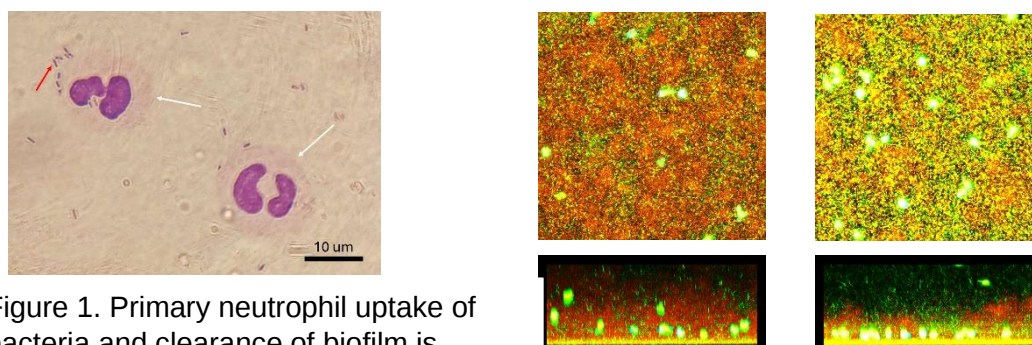


Figure 1. Primary neutrophil uptake of bacteria and clearance of biofilm is enhanced by NeutroCure compounds.

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NEWS FROM RESEARCH TEAMS

Congratulations to Martin Herrmann on his retirement. We are pleased to welcome Luis to the NeutroCure consortium to continue the excellent work from Martin (Luis.Munoz@uk-erlangen.de)



Luis E. Muñoz, studied medicine at the Universidad de Oriente, graduating in 1999 and in 2002 he received his Master of Science in Immunology from the Universidad de Los Andes in Venezuela. He started his research career as an immunologist in 2002 with the analysis of autoantibody profiles of patients with SLE at the Institute for Clinical Immunology at the Universidad Central de Venezuela in Caracas. In 2008, he completed his doctorate as Dr. med in Immunology and, in 2011, he completed his doctorate in Genetics at the Friedrich-Alexander University in Erlangen-Nuremberg (FAU). His research focus is on the biology of neutrophils and their immunoregulatory properties. He obtained teaching qualifications at the FAU, where he since 2019 leads a junior working group in the Department of Internal Medicine 3 - Immunology and Rheumatology.

CONFERENCE updates

Throughout 2024, Redoxis actively participated in several key international meetings, including the **Nordic Life Science Days in Malmö** (nlsdays.com), the **New Horizons in Biologics & Bioprocessing, ATMP** in Copenhagen (nmevents.se/bioprocessing-copenhagen), and the **BIO-Europe** in Stockholm (europabio.org/event/bio-europe-2024).

In 2025, Redoxis has participated in the **BIO-Europe Spring in Milan** (informaconnect.com/bioeurope-spring/), the **BIO International Convention** in Boston, the **BIO Japan** (jcd-expo.jp/en/about.html), and the **Nordic Life Science Days** in Gothenburg (nlsdays.com).

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Pronoxis – Peter Olofsson- Sahl participated in **Bio Europe** in Stockholm, November 2024 (<https://informaconnect.com/bioeurope/>), **AMR conference** in Basel, February 2025 (<https://amr-conference.com/program/>), **EIC summit** 2025 in Brussel, April 2025 (https://eic.ec.europa.eu/eic-summit-2025_en) and **Nordic Life Science** in Göteborg, October 2025 (<https://nlsdays.com/>).

FAU group and collaborators (Prof. Oliver Kepp, Prof. Guido Kroemer, Gustave Roussy Cancer Center as well as Luis E. Muñoz, University Hospital Erlangen) presented at the conferences:

17th International Symposium on Applied Bioinorganic Chemistry, 15-18 June 2025, Uppsala, Sweden, Invited presentation, Andriy Mokhir "Amplifiers of reactive oxygen species targeting nucleic acids in cancer cells";

22nd SFRR Biennial Meeting 2025 "The New Era of Redox Biology: from Basic Biochemistry to Redox Omics", June 03-06 2025, Galway, Ireland, Poster presentation of Marlies Körber "RNA targeting redox active N-Alkylaminoferrocene based prodrug with high anti-cancer efficacy";

XII Nucleic Acid Meeting, September 18-19, 2025, Hamburg, Germany. Poster presentation, Marlies Körber "RNA targeting and redox active N-Alkylaminoferrocene based prodrug with high anti-cancer efficacy";

Andriy Mokhir (FAU) presented an invited lecture "Amplifiers of reactive oxygen species targeting nucleic acids in cancer cells" at the institute seminar in Iasi, Romania, Petru Poni Institute of Macromolecular Chemistry on 17.07.2025;

22nd SFRR Biennial Meeting 2025 "The New Era of Redox Biology: from Basic Biochemistry to Redox Omics", June 03-06 2025, Galway, Ireland, Poster presentation of Marlies Körber "RNA targeting redox active N-Alkylaminoferrocene based prodrug with high anti-cancer efficacy".

The Swansea group presented at a number of conferences:

22nd SFRR Biennial Meeting 2025 "The New Era of Redox Biology: from Basic Biochemistry to Redox Omics", June 03-06 2025, Galway, Ireland, Poster presentation of Heather Chick "Enhanced oxidative burst in neutrophils alters phenotype associated with reduced microbial growth: PP I E08";

SFFR-E Istanbul Conference. From Molecules to Tissues: Redox Biology in Action, June 2024, Heather Chick presented a poster titled '*Establishing an oxysterol signature in neutrophils following initiation of oxidative burst*'.

ECR Co-chair at MicroSoc 2024 in Edinburgh, April 2024. Heather Chick was appointed as Co-chair of the session "Small Talk: Mechanisms of sensing and signalling at the host-microbe and microbe-microbe interface".

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SFFR-E Istanbul Conference. From Molecules to Tissues: Redox Biology in Action, June 2024. Megan Chambers presented a poster titled 'Novel ROS inducing compounds influence CD4+ T cell activation.' and was awarded a prize.

In April 2024, Louie Barnes also presented at the **MicroSoc** 2024 in Edinburgh.

Prizes and Awards

Dr Heather Chick, Swansea University, was also awarded best poster prize at the Society for Free Radical Research Europe Conference, during June 2025, held in Galway, Ireland for her poster entitled: Enhanced oxidative burst in neutrophils alters phenotype associated with reduced microbial growth.

Mr Louie Barnes, Swansea University, was awarded an MPhil for his NeutroCure Research in April 2025.

Insa Klemt, a PhD student working in NeutroCure, has successfully defended her PhD thesis.

Insa has received a prestigious STADTLER-Foundation doctoral prize for her thesis in 2024. She now works as a postdoctoral researcher at the Institute of Biochemistry, ETH Zürich, Switzerland, research group of Prof. Dr. M. Peter.



Insa is fifth from the left.

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Bohdan Golub, who is a part of NeutroCure and will be responsible for further exploitation of NCure compounds, has successfully defended his doctoral thesis in 2024.



FOLLOW ON GRANT FUNDING

We are delighted to announce that Dr Heather Chick, Swansea University, was awarded a St David's Medical Foundation SeedCorn grant to explore Neutrophil-Biofilm Interactions, and the effects of NeutroCure compounds.

NeutroCure members supported the application of Professor Jesmond Dalli, Professor of Molecular Pharmacology at Queen Mary, in developing a new COST Action, which has been funded as the first EU-wide network focused on Resolution Biology.

Pronoxis received Swedish national innovation agency (Vinnova) funding in May 2024, to create consortia and apply for EIC- Transition. Applications have been submitted in September 2024 and 2025. also including partber Swanse from Neutrocure

Pronoxis have received an EIC booster grant. In June 2025, to elevate innovation into commercial, business planning and establishment of the startup company Inicure

Preparation of future exploitation in the framework of the start-up ROXimmune:

<https://www.linkedin.com/company/roximmune/about/>

https://www.linkedin.com/posts/nucleategermany_activator-activator-nucleategermany-activity-7326591863124062208-SOP6/

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Dr. Bohdan Golub, FAU has participated in the following activities:

Attending the **Franken Finance Festival 2023**, where we had numerous personal meetings with venture capitalists, angel investors, and representatives of government funding programs. *05.07.2020.*

Participating in **BioTech Bootcamp 2023** (SMILE, Lund; BioM, München). Only 9 out of 40 early-stage start-ups were selected for the program. An extensive 8-week program with exposure to industry experts, venture capitalists, and consultants designed to give all the necessary tools to founders of start-ups. *09.10.2023-07.12.2023.*



Safe ROS amplifiers as drugs

European Consortium

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Participation in **BayOConnect Conference** where we pitched the idea of further exploitation of NCure prodrugs/drugs and connected with contract research and development organizations to evaluate potential contract work that can be done for the planned start-up company ROXimmune. 02.07.2024-03.07.2024.



2 - 3 July 2024 | Munich

Design Offices München Macherei

I'll pitch my biotech idea!

Meet me at BayOConnect
on 2 - 3 July in Munich!

www.bayoconnect.org

In 2025, ROXimmune has become officially a part of **BioM Biotech Cluster**.

Attracted two industry experts to become future co-founders and to have a team for grant applications (EXIST, GO-Bio). **Dr. Jelena Milic and Dr. Johannes Farkas** were selected from several candidates in the "hiring" process combining more than 4 decades of start-up, academia and Big Pharma experience.

Participated in **EIC T2M Bootcamp for innovative researchers** and **EIC T2M Pioneer Programme**. 23.09.2024-15.01.2025.

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Application together with Dr. Milic and Dr. Farkas for **GO-Bio next** funding programme in Germany (15.03.2025). The consortium is currently in the last selection round (as one of 13 teams that were selected among 58 applicants).

ROXimmune was selected as one of 9 teams among more than 20 applicants into highly prestigious **Nucleate Activator** (German cohort). The program spanned from 01.02.2025-13.06.2025 and involved workshops with industry experts and networking with potential investors.

OUTREACH

For public engagement on NeutroCure goals, the following events were organised and delivered by consortium members:



ICBP team in cooperation with LicorBIO upgraded the imaging possibilities, now able to measure 2 infrared channels with up to 5 μm resolution in tissue. This new advancement was already applied to the tasks withing some Deliverables of the partner.

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ICBP

A. Lazar Job Shadowing Outreach

- The NeuroCure team presented demonstrations and short lectures on NeuroCure-relevant technologies during ICBP-organized student visits, as part of the Lazar Job Shadowing event.
- Events:
 - April 18, 2024 – Bucharest
 - [Event link](#)
 - October 24, 2024 – Bucharest
 - October 2025 (planned) – Bucharest



B. STEM Education Outreach (UNESCO Project)

- *Rostyslav Bilyy* presented outreach opportunities within the EU research framework in the context of the project “*Gender and STEM Education in Romania.*”
- This initiative is part of the UNESCO Venice Regional Office project: “*Revitalizing STEM Education to Equip New Generations with STEM Competencies.*”

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- Event: February 6, 2025 at Hermann Oberth International School.

[Project link](#)

[Event post](#)



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CONSORTIUM MEETINGS

In 2024 and 2025, we held monthly meetings to enable rapid dissemination of new findings between group members, and in addition held further meetings between specific teams to advance specific protocols and analyses..

We held formal consortium meetings on zoom on the last Thursday in every month to share knowledge between partners and increase opportunities for early career researchers to present their findings.

The typical agenda has been as follows, and is scheduled to enable participants to join from across the world according to their schedules:

Agenda

14:00 - 15:30 (German time): Short progress reports of research groups (10 min + discussion)

15:30 - 16:00: Discussion of organizational issues.

PUBLICATIONS 2024 and 2025

Glucose Solution as a Vehicle for ROS-Enhancing Ferrocene Drugs

G Bila, V Utko, R Bilyy

<https://zenodo.org/records/15367206>

Novel Drugs Targeting for Immunogenic Cancer Cell Death

G Bila, A Arkhypov, I Klemm, A Mokhir, R Bilyy

South East European Journal of Immunology 8 (CITIM), 032-032

Air Pouch Models for Immunotherapy Evaluation of ROS-Enhancing Anticancer Compounds

G Bila, A Mokhir, R Bilyy

South East European Journal of Immunology 8 (CITIM), 066-066

Squaraine-Peptide Conjugates as Efficient Reporters of Neutrophil Extracellular Traps-Mediated Chronic Inflammation

SK Mavileti, G Bila, V Utko, R Bilyy Jr, E Bila, E Butoi, S Gupta, P Balyan, ...

ACS Applied Materials & Interfaces

Targeting Lysosomal Thiols for Immunogenic Cancer Cell Death

A Arkhypov, I Klemm, G Bila, D Attia, S Chernii, R Bilyy, A Mokhir

Angewandte Chemie International Edition 64 (5), e202417509

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Metabolic Heterogeneity in Diffuse Large B-Cell Lymphoma Cells Reveals an Innovative Antimetabolic Combination Strategy

L Lordello, S Nuan-Aliman, K Kielbassa-Elkadi, A Montagne, K Kotta, ...
Cancers 17 (3), 394

Immunogenic oncolysis by tigilanol tiglate

JG Pol, M Lizarralde-Guerrero, G Kroemer
OncoImmunology 13 (1), 2360230

Benzodiazepines compromise the outcome of cancer immunotherapy

L Montégut, L Derosa, M Messaoudene, H Chen, F Lambertucci, B Routy, ...
Oncoimmunology 13 (1), 2413719

Clinically relevant GABARAP deficiency abrogates bortezomib-induced immunogenic cell death in multiple myeloma

L Zhao, Z Shen, G Kroemer, O Kepp
OncoImmunology 13 (1), 2360275

Acyl CoA binding protein (ACBP): an autophagy checkpoint that can be targeted for improving cancer immunosurveillance

L Montégut, I Martins, G Kroemer
OncoImmunology 13 (1), 2413200

RIPK1 inhibition in malignant cells potentiates immunotherapy and radiotherapy outcome

JG Pol, A Checcoli, M Lizarralde-Guerrero, G Kroemer
OncoImmunology 13 (1), 2425465

Targeted opening of the blood–brain barrier facilitates doxorubicin/anti-PD-1-based chemioimmunotherapy of glioblastoma

JG Pol, M Lizarralde-Guerrero, A Checcoli, G Kroemer
OncoImmunology 13 (1), 2385124

Neutralization of the autophagy-repressive tissue hormone DBI/ACBP (diazepam binding inhibitor, acyl-CoA binding protein) enhances anticancer immunosurveillance

L Montégut, I Martins, G Kroemer
Autophagy 20 (12), 2836-2838

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The autophagy-repressive tissue hormone DBI/ACBP (diazepam binding inhibitor, acyl-CoA binding protein) suppresses anorexia

H Chen, I Martins, G Kroemer
Autophagy 20 (12), 2827-2829

Two decades of advances in clinical oncology—lessons learned and future directions

S Banerjee, CM Booth, E Bruera, MW Büchler, A Drilon, TJ Fry, ...
Nature Reviews Clinical Oncology 21 (11), 771-780

Calpain-1 weakens the nuclear envelope and promotes the release of neutrophil extracellular traps

J Singh, L Zlatar, M Muñoz-Becerra, G Lochnit, I Herrmann, F Pfister, ...
Cell Communication and Signaling 22 (1), 435

Red Fluorescent Aminoferrocene (Pro)Drugs for *in Cellulo* and *in Vivo* Imaging

S Chernii, R Selin, G Bila, R Bilyy, M Körber, A Mokhir
Chemistry—A European Journal 30 (48), e202401107

Anti-ageing interventions for the treatment of cardiovascular disease

M Abdellatif, ST Schmid, A Fuerlinger, G Kroemer
Cardiovascular Research, cvae177

Nano-und Mikropartikel und ihre Rolle bei Entzündungen und Immunantwort: Fokus auf neutrophile extrazelluläre Fallen

G Bila, A Rabets, R Bilyy
Biomedizinische Nanomaterialien: Vom Design und der Synthese bis hin zu ...

Neutrophil extracellular traps characterize caseating granulomas

L Zlatar, J Knopf, J Singh, H Wang, M Muñoz-Becerra, I Herrmann, ...
Cell Death & Disease 15 (7), 548

Neutrophil depletion changes the N-glycosylation pattern of IgG in experimental murine sepsis

KO Yaykasli, KA van Schie, REM Toes, M Wuhrer, CAM Koeleman, G Bila, ...
International Journal of Molecular Sciences 25 (12), 6478

Pathogenic hyperactivation of mTORC1 by cytoplasmic EP300 in Hutchinson-Gilford progeria syndrome

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L Ferret, G Kroemer, M Djavaheri-Mergny
Cell Stress 8, 51

Vesicular Messages from Dental Biofilms for Neutrophils

L Vitkov, J Krunic, J Dudek, MR Bobbili, J Grillari, B Hausegger, ...
International Journal of Molecular Sciences 25 (6), 3314

Effects of carotenoids on mitochondrial dysfunction

OS Ademowo, O Oyeboode, R Edward, ME Conway, HR Griffiths, IHK Dias
Biochemical Society Transactions 52 (1), 65-74

Neutrophil activity and extracellular matrix degradation: drivers of lung tissue destruction in fatal COVID-19 cases and implications for long COVID

T Narasaraju, I Neeli, SL Criswell, A Krishnappa, W Meng, V Silva, G Bila, ...
Biomolecules 14 (2), 236

Spermidine alleviates depression via control of the stress response

S Mackert, C Niemeyer, Y Mecdad, T Ebert, T Bajaj, S Durand, SJ Hofer, ...
bioRxiv, 2024.12. 04.626625

Neutrophils and Neutrophil Extracellular Traps in Autoimmune, Occlusive and Infectious Diseases

L Zlatař
PQDT-Global

A concept of dual-responsive prodrugs based on oligomerization-controlled reactivity of ester groups: an improvement of cancer cells versus neutrophils selectivity of camptothecin

I Klemt, V Reshetnikov, S Dutta, G Bila, R Bilyy, IC Cuartero, A Hidalgo, ...
RSC Medicinal Chemistry 15 (4), 1189-1197.

Neutrophil NADPH oxidase promotes bacterial eradication and regulates NF-κB-Mediated inflammation via NRF2 signaling during urinary tract infections.

Cotzomi-Ortega I, Rosowski EE, Wang X, Sanchez-Zamora YI, Lopez-Torres JM, Sanchez-Orellana G, Han R, Vásquez-Martínez G, Andrade GM, Ballash G, Cortado H, Li B, Ali Y, Rascon R, Robledo-Avila F, Partida-Sanchez S, Pérez-Campos E, Olofsson-Sahl P, Zepeda-Orozco D, Spencer JD, Becknell B, Ruiz-Rosado JD.
Mucosal Immunol. 2025 Apr;18(2):402-417.

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COMMUNICATIONS

Google Scholar is used to gather Neutrocure publications together in a searchable format. It identifies 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 published by consortium members since 2018, and the exponential increase in those citations since the NeutroCure project was funded by the EU.

