PERSONAL INFORMATION

Kahlert, Ulf Dietrich

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Date of birth: 25th October 1982

Nationality: German

URL for web site: www.mes.ulf-kahlert.com ; https://kchi.med.ovgu.de/MEC.html

- **EDUCATION**

20/11/2020	**Habilitation**	Faculty of Medicine/ University Düsseldorf, Germany
13/07/2012	PhD	Faculty of Biology/ University of Freiburg i. Br., Germany
01/05/2008	Diploma	Faculty of Biology/ University of Freiburg i. Br., Germany

- **CURRENT POSITION(S)**

Since 10/2021 **Professor (W2) and Head of Department**
Molecular and Experimental Surgery (MES), Clinic for General, Visceral and Vascular Surgery, Faculty of Medicine, Otto-von-Guericke Univeristy Magdeburg, Germany

Since 04/2018 **Professor (Adjunct)**
Beijing Capital Medical University, Beijing, PR China

- **PREVIOUS POSITION(S)**

09/2019-09/2020 Resort director research: YoungNOA
(official working group of the German Cancer Society/DKK)

04/2017-09/2020 Investigator
German Consortium Translational Cancer Research (DKTK)

01/2016-09/2020 Group Leader
Clinic of Neurosurgery, Faculty of Medicine, Univ. Düsseldorf, Germany

- **FELLOWSHIPS AND AWARDS**

2014 Outstanding abstract in "Translational Science"
Johns Hopkins Young Investigator Day in Pathology, Baltimore, MD, USA

03/2013-11/2015 Dr. Mildred-Scheel Postdoctoral Fellowship by the German Cancer Aid
Johns Hopkins Hospital, Baltimore, MD, USA

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

Since 2020 3 Postdocs/ 2 PhD students / 1 Clinician Scientists/ 3 medical students
Faculty of Medicine, Otto-von-Guericke Univeristy Magdeburg, Germany

2016-2020 4 Postdocs/ 3PhD students / 2 Master Students/3 medical students
Faculty of Medicine, Heinrich-Heine Univ. Düsseldorf, Germany

- **TEACHING ACTIVITIES**

Since 2020 "Molecular surgery – when today is tomorrow´s yesterday" (lecture series), faculty of medicine, Univ. Magdeburg, Germany

2016-2020 "Molecular diagnostics in cancer", model degree program of medicine: Head and Neck diseases, seminar series (weekly 1.5 hours), Univ. Düsseldorf, Germany

2016-2020 "Cancer Metabolism" (lecture series), Molecular Oncology (Master), Univ. Düsseldorf, Germany

- **ORGANISATION OF SCIENTIFIC MEETINGS**

June 2022 2-day Cancer Nanomedicine Workshop in the framework of COST Action 17140 = organizer of the international meeting with 45 speakers, Magdeburg, Germany

- **INSTITUTIONAL RESPONSIBILITIES**

Since 2021 → all at Faculty of Medicine, Otto-von-Guericke University Magdeburg, Germany
Faculty member,
Head of Commission for International Relationships,
Scientific Member Animal Welfare Commission,

- **REVIEWING ACTIVITES**

Since 2017 – Reviewer for grant agencies including:
European Union Horizon 2020: TRASCAN; German research foundation (DFG, Germany): research project, Croatian Science Foundation HRZZ (Croatia), CancerCare Manitoba Foundation (Canada), Stoneygate Children Brain Tumor Research Fund (UK), Czech Science Foundation (CZ), Hungarian Centre of Excellence for Molecular Medicine (Hungary), French National Cancer Institute (INCa), National Science Centre Poland, Tiroler Wissenschaftsförderung (Austria), Willy Gepts Research Foundation (Belgium),…

Since 2017 – Editorial Board of Scientific Journals:
Journal of Neuro-Oncology (Springer), Journal of Personalized Medicine (MDPI)

Since 2012 – Reviewer for scientific journals including:
Lancet Oncology, Nature Communications, Acta Neuropathologica, Neuro-Oncology, Biosensors and Bioelectronics, Cancer Communications, International Journal of Cancer (IJC), Cancer Letters, Brain Pathology, British Journal of Cancer (BJC),…

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

American Association for Cancer Research (AACR); Advisory Network Schering Foundation; European Cooperation for Science and Technology (COST) – Cancer Nano2Clinic, German Cancer Society (DKG), D.I.N. Standards Committee "Biotechnology" (NA 063-09-02 AA) and "Biobanks/ Bioresources" (NA 063-09-02-02 AK)

- **MAJOR COLLABORATIONS**

Various on national and international level, strong connections to Asia (South Korea and China) and Israel

- **COVID-19 IMPACT TO SCIENTIFIC PRODUCTIVITY**

Please specify which of the following situations apply to you:

- ☐ Increased caring responsibility for dependent person, including home schooling of children;
- ☐ No access to laboratory facilities, archives, or other necessary facilities;
- ☐ No access to field work;
- X Adaptation to online teaching;
- ☐ Physical and/or mental health issues;
- ☐ Other(s) _____

Ongoing grants

Project Title	*Funding source*	*Amount (Euros)*	*Period*	*Role of the PI*	*Relation to current ERC proposal*[1]
MERGE - Mulitplex CRISPR/Cas sensor for the detection of cancer stem cells	German Federal Ministry of Education and Research (BMBF)	1.350.000	04/2021-03/2024	Bio-samples generation (disease modelling and clinical samples), miRNA testing body fluids	None, EV expertise
Yap signalling as tuneable mediator of ultrasound-stimulated liver regeneration	German Cancer Aid (clinician scientist position for one year)	100.000	04/2022-03/2023	Disease modelling, liver regeneration model	Hepatocellular differentiation of iPSC has been established in lab and MEMOMICS will directly benefit from this expertise
AMINO - metabolic instruction of immunity of stem cells in cancers	German Research Foundation (DFG)/ Sino-German Center for Research Promotion	42.000	09/2019-12/2022 (extension applied)	Disease modelling, stem cell activity tests	None
Implant for early tumor detection	Volkswagen Foundation	120.000	10/2019-07/2023	Disease modelling, prototype development	None

Kahlert - Early achievement track-record

Narrative descriptive paragraph:
Prof. Kahlert´s work exploits stem cell technologies for the development of precision medicine. He focuses on the clinical translational aspects of stem cell biology in a global growing clinical need: oncology. His work bridges developmental biology, stem cell sciences and clinical and surgical oncology, requiring the development and exploitation of structured networks incorporating basic science, biotechnology, conservative oncology as well as medical device development. As a director of MES, his research team focuses on: a) **Biological twin technology** for cancers as functional, animal free platform technology to identify biomarkers and intervention strategies for individualized and thereby optimized therapy. His particular interest is investigating the mechanisms of the neural microenvironment onto tumorigenesis and development of cancers´ therapy resistance by developing next generation cancer cell- human neuron assembloids. b) Manufacturing and testing **new label-mediated or label-free imaging solutions directed towards molecular structures** of malignant tissues. With this effort, he aims to contribute to the emergence of future intraoperative guidance tools helping to improve robotic surgery performance such as speed and visualization of deeper tissue areas. c) The production on **"Cancer Alternatives"**, meaning the genetic engineering of pluripotent stem cells with cancer-related genes or gene alterations. The application of this *in vitro* technology in the context of testing of various interventions has proven the potential of Cancer Alternatives in improving early biomarker-directed drug development or toxicology testing. Moreover, comparative multi-lineage differentiation to investigate any tissue dependency of selected oncogenic alterations, such as mediating therapy resistance or induction of cell growth i.e.. He contributes to the establishment of new lab quality control measures to improve successful research reproducibility. His work has been award with various awards and research grants. He is the author of 76 scientific papers (cumulative impact > 330, h-factor 24) of what he is senor or first author in more then 30, showing his extreme productivity and innovation. He serves as constant reviewer for leading cancer journals and scientific funding bodies in Europe. He is an accredited member in international standardization committees such as ISO Biotechnology and award winning lecturer in student teaching.

Contributions to science:

Quality control

Sparked by the alarming occurrence of the cancer reproducibility crisis, Prof. Kahlert has initiated a meta-research branch in his team to improve the requirements for method and material reporting in scientific cancer literature (Sander et al., 2022) and digitalize lab data management with Open Source platforms (Hewera et al., 2021).

Animal-Free in vitro systems: Cancer Alternatives

Classical cancer *in vitro* disease modelling relies on the use of patient specimen. Such patient-derived disease modelling is considered the clinical most relevant approach with its recent manifestation in functional genomic studies. However, some recent evidences lead to question the unequivocal use of these disease models in drug development perspectives and to quantify CSC biology. Prof. Kahlert was part of a group of investigators hat developed the concept of Cancer Alternatives based on the introduction of cancer-relevant genetic elements in healthy stem cells. With this attempt new molecular subtype-specific tumor models where generated leading to identification of new chemotherapies that particual perform in the context of a given mutation (Hanaford et al., 2016; Khan et al., 2021; Uhlmann et al., 2022).

EMT as tumor-agnostic process: In his doctoral work, Prof. Kahlert for the first time showed the relevance of epithelial to mesenchymal transformation (EMT) as an relevant molecular event in cancer formation outside of epithelial progeny. Focusing on malignant brain cancer, using primary cell and stem cell-based disease modelling, genetic tools, and implementation of back then fore front of large scale genomic data of clinical samples, he provided ever first evidence of transcriptional EMT activator ZEB1 to serve as an attractive tumor-agnostic target in. Moreover, his work was one one of the first ever reports claiming canonical Wingless/WNT signalling to drive glioma biology(Kahlert et al., 2015a, 2013; Ulf D Kahlert et al., 2012). WNT and EMT in neuro oncology are well-established research areas by now. Prof. Kahlert paved the way for the new terminology to describe these molecular processes (glial-to-mesenchymal transformation/GMT).

Hypoxic niche of tumor stemness

Cancer stem cells (CSCs) are regulated by niche factors including hypoxia. By using bona fide CSC marker CD133, Prof. Kahlert discovered that the hypoxic CSC niche is not only environmental factor that selects for CSC but also can reversibly induce tumor stemness in cancer cells(Ulf Dietrich Kahlert et al., 2012). Moreover, this induced phenotype in essence turn on a multi-step molecular program leading to the augmented motility of those cells, allowing the escape of those oxygen-deprived location (Kahlert et al., 2015b). Fast growing cancers feature hypoxic/peri-necrotic foci that represent birthplaces for super-invader cells(Maciaczyk et al., 2017, p. 1) and might explain at least in part the clinical failure of anti-angiogenic therapies in glioma patients.

Glutaminolysis as potent and drugable driver of tumor stemness

Notch signalling pathway is a hallmark of cancer stem cells. Pharmacological blockage of Notch, however, failed to reveal long-lasting clinical benefits in cancer patients due to the enormous side effects. This results from the wide substrate specificity of the pathway signal mediating enzyme gamma-secretase used as the therapeutic target in many interventions strategies. Prof. Kahlert discovered activation of cellular glutaminolysis as a downstream signal mediator of brain cancer Notch activity, with particular potency of glutamate hydrolysing enzyme glutmaninase. In follow up projects, his team verified target specificity of clinical GLS inhibitor agent CB839 (Koch et al., 2020) and further optimized its effectivity by nano-functionalization ion gold carrier platform and anti-CD133 directed RNA apdamer decoration (Poonaki et al., 2022).

References:

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