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Research field: Cancer cell biology, cell death, ferroptosis

The evolution of cancer is tightly regulated by repeated cycles of cell proliferation, selection of the fittest clone and cell death of all weaker clones. Thereby, cancers strictly follow the rule of "Darwinian" selection throughout their existence. Although the induction of cell death in a cancer cell is wanted from a therapeutic viewpoint, it is also the driver behind selection for the most aggressive cancer cell clone. Moreover, even before tumours are put through selective pressure via chemotherapy and other more targeted treatments, they have already undergone many rounds of selection via cell death induction by the immune system. Mechanisms of regulated cell death directly triggered by the immune system or facilitated by it are manifold and include extrinsic apoptosis, necroptosis, ferroptosis and possibly pyroptosis.

The von Karstedt lab investigates the function of different modes of cell death, in particular ferroptosis in

- The selection of the fittest mutant KRAS clone in non-small cell lung cancer (NSCLC)
- Influencing progression of premalignant KRAS-driven pancreatic lesions
- The development and treatment of small cell lung cancer (SCLC)

By unravelling mechanisms of selection-of-the-fittest in lung and pancreatic cancer, we anticipate to identify pathways which select for (NSCLC, pancreatic cancer) or against (SCLC) driver mutations and at the same time to find new therapeutic vulnerabilities to treat these cancers.

Funding / grant(s):

- 2020-2022 Project A06: "Elucidation of ferroptosis-inducing therapy (FIT) for the treatment of pancreatic cancer" https://www.cmmc-uni-koeln.de/research/research-areas-projects/research-area-a/silvia-von-karstedt-a-06 funded by the CMMC
- 2020-2023 Project A05 within SFB1403 "Cell Death in Immunity and Inflammation" https://sfb1403.uni-koeln.de/ funded by the DFG
- 2020-2022 project funding: "Targeting ferroptosis pathway vulnerability in small cell lung cancer (SCLC)" by the DFG
- 2019-2023 Project A05 within SFB1399 "Mechanisms of drug sensitivity and resistance in Small cell lung cancer" https://www.sfb1399.de/about-us/collaborative-research-center-1399 funded by the DFG
- 2019-2023 eMed (InCa) by the Bundesministerium für Bildung und Forschung (BMBF)
- 2017-2021 University of Cologne-Medical Faculty- Köln Fortune
- 2017-2021 Max-Eder-Junior Research Group Programme (Deutsche Krebshilfe)

Last two research positions:
(position, time period, lab or PI, research institute, Country)

1. Postdoctoral research fellow, 06.2016 - 07.2017, lab of Prof. Julian Downward, The Francis Crick Institute, London, UK

2. Postdoctoral research fellow, 03.2013 - 05.2016, lab of Prof. Henning Walczak, UCL Cancer Institute, London, UK

What do you think were the major milestones in your career that led to your position as group leader (e.g. could be motivations, publications, coincidences, "right" field of science, network)?

I always wanted to have my own lab. As a PhD student and postdoc, I attended many international meetings and networked a lot. Thereby, I established a supportive network and people in the field got to know that I was soon to start my own lab. This led to a chat at a meeting in Ghent where it was suggested to me to contact the department in Cologne where I am now part of. I think it is crucial to be “visible” beyond publications which means to make that extra effort and ask that “smart question” early on in your career at a meeting that people may remember you for. Getting the first grant would of course not have been possible without the right kind of high-impact publications required.