GYNECOLOGIC ONCOLOGY LAB

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SUMMARY & MISSION STATEMENT

Our research is focused on the origin and the molecular basis of malignancies that affect women, including ovarian cancer and breast cancer. We aim to gain basic knowledge that will promote more effective and better-tolerated treatment strategies for these diseases.

OVERVIEW

In our clinic, we treat women that have developed a tumor in the reproductive organs or in the breast. These cancers occur relatively frequently and some of them are difficult to treat. Especially ovarian cancer is still one of the most lethal malignancies in women with a 5 year overall survival rate of only 40%.

On the molecular level, ovarian cancer as well as breast cancer are very heterogeneous diseases, but in some subtypes specific genetic mutations frequently occur. These include BRCA1 and BRCA2 mutations in hereditary breast and ovarian carcinoma (HBOC) syndrome and ARID1A mutations in ovarian clear cell carcinoma and endometrioid ovarian carcinoma. Our research focuses on the molecular and functional characterization of these genes. To this end, we combine state-of-the-art biochemistry and molecular biology with advanced cell imaging technologies, including live cell imaging and software-assisted image analysis. Furthermore, we also follow a translational approach in which we try to design novel treatment strategies for these malignancies by using small molecule compound libraries and high-content screening techniques to systematically search for specific vulnerabilities in cancers with specific genetic alterations.

SELECTED CANCER RELATED PUBLICATIONS

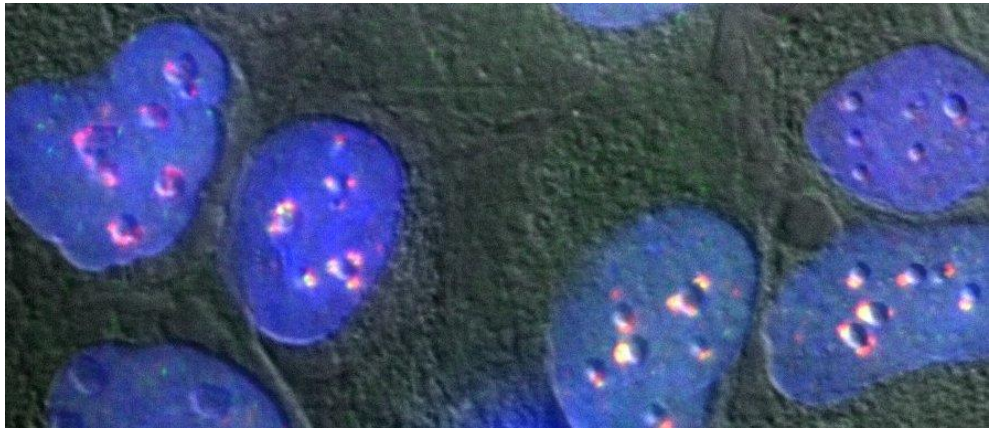
Somatic BRCA1 mutations in clinically sporadic breast cancer with medullary histological features. Rechsteiner M, Dedes K, Fink D, Pestalozzi B, Sobottka B, Moch H, Wild P, Varga Z. **J Cancer Res Clin Oncol.** 2018 May;144(5):865-874

Tissue glycomic distinguish tumour sites in women with advanced serous adenocarcinoma. Anugraham M, Jacob F, Everest-Dass AV, Schoetzau A, Nixdorf S, Hacker NF, Fink D, Heinzelmann-Schwarz V, Packer NH. **Mol Oncol.** 2017 Sep;11(11):1595-1615

Lack of MRE11-RAD50-NBS1 (MRN) complex detection occurs frequently in low-grade epithelial ovarian cancer. Brandt S, Samartzis EP, Zimmermann AK, Fink D, Moch H, Noske A, Dedes KJ. **BMC Cancer.** 2017 Jan;17(1):44

The NBS1-Treacle complex controls ribosomal RNA transcription in response to DNA damage. Larsen DH, Hari F, Clapperton JA, Gwerder M, Gutsche K, Altmeyer M, Jungmichel S, Toledo LI, Fink D, Rask MB, Grøfte M, Lukas C, Nielsen ML, Smerdon SJ, Lukas J, Stucki M. **Nat Cell Biol.** 2014 Aug;16(8):792-803

Loss of ARID1A expression sensitizes cancer cells to PI3K- and AKT-inhibition. Samartzis EP, Gutsche K, Dedes KJ, Fink D, Stucki M, Imesch P. **Oncotarget**. 2014 Jul;5(14):5295-5303



This image shows the recruitment of the tumor suppressor BRCA1 (red) to nucleolar caps upon induction of DNA double-strand breaks in the rDNA repeats. BRCA1, frequently mutated in familial breast and ovarian cancer, is implicated in the repair of DNA double-strand breaks by homologous recombination.