

Assessment of heterogeneity of methods for studying circulating microRNA and the impact of estrogen in patients with BRCA1/2 and familial risk

Katarzyna Płoszka, MSc

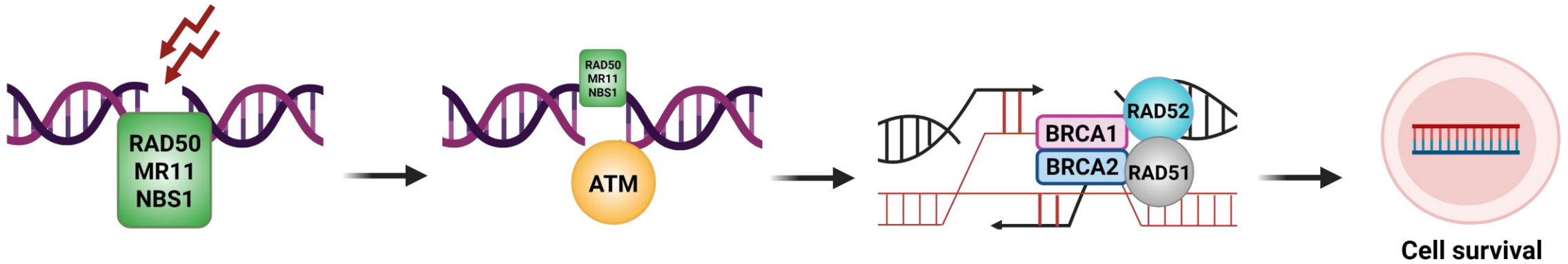
Supervisor: Prof. Wojciech Fendler, M.D., Ph.D.

Auxiliary Supervisor: Prof. Agata Pastorczak, M.D., Ph.D.

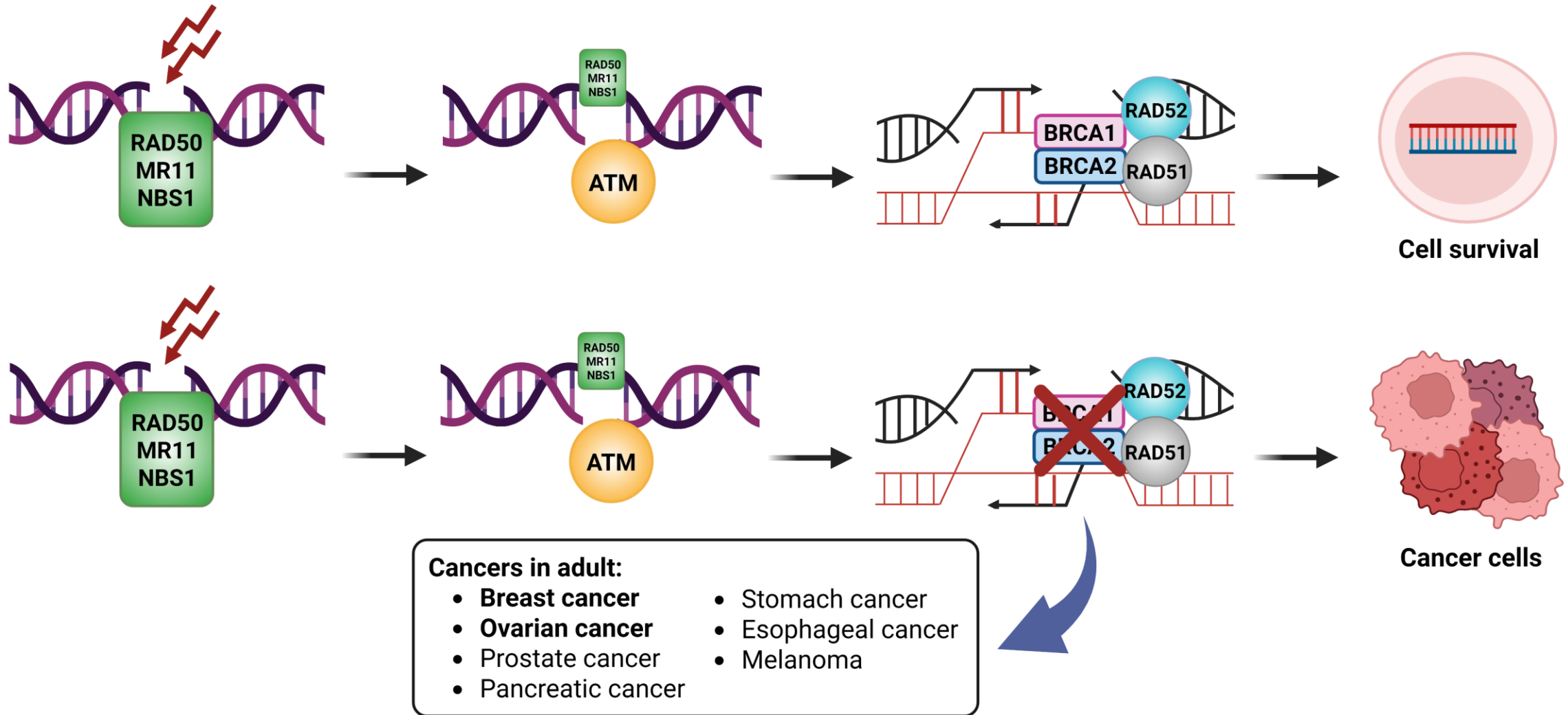
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Homologous recombination



Homologous recombination deficiency (HRD)



HRD and miRNA signature


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Identification of *BRCA1/2* mutation female carriers using circulating microRNA profiles

[Kevin Elias](#), [Urszula Smyczynska](#), [Konrad Stawiski](#), [Zuzanna Nowicka](#), [James Webber](#), [Jakub Kaplan](#), [Charles Landen](#), [Jan Lubinski](#), [Asima Mukhopadhyay](#), [Dona Chakraborty](#), [Denise C. Connolly](#), [Heather Symecko](#), [Susan M. Domchek](#), [Judy E. Garber](#), [Panagiotis Konstantinopoulos](#), [Wojciech Fendler](#)  & [Dipanjan Chowdhury](#) 

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miRNA signature in 2023



 NARODOWE
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Predictive Potential of
Circulating MicroRNA
Biomarkers in Patients with
High Familial or Genetic Risk
of Cancer

Prof. Wojciech Fendler, M.D., Ph.D.



OPUS-25



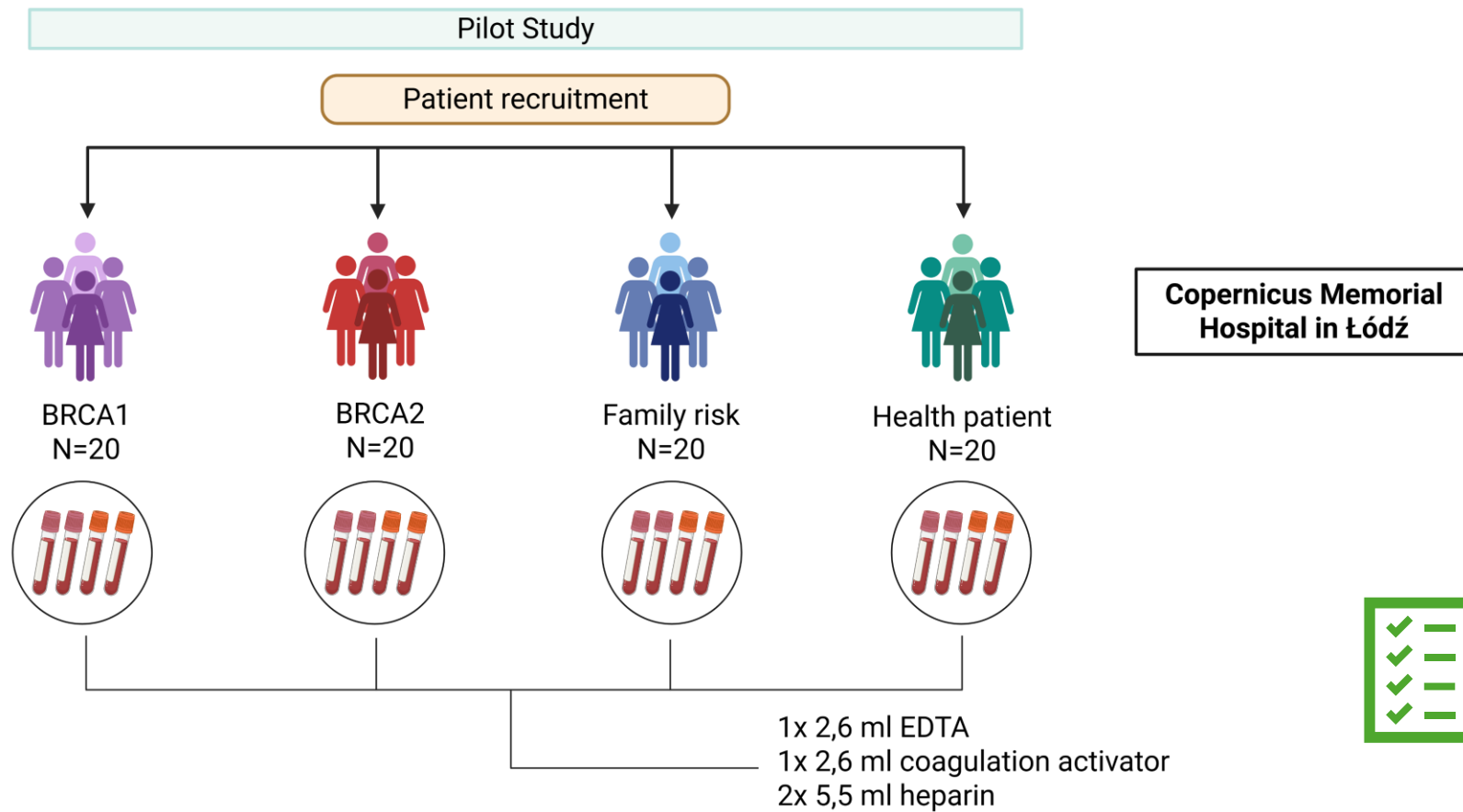
OPUS-25 PhD Scholar (from 2024 Nov)

Assessment of heterogeneity of
circulating microRNA testing methods in
BRCA1/2 and family risk patients



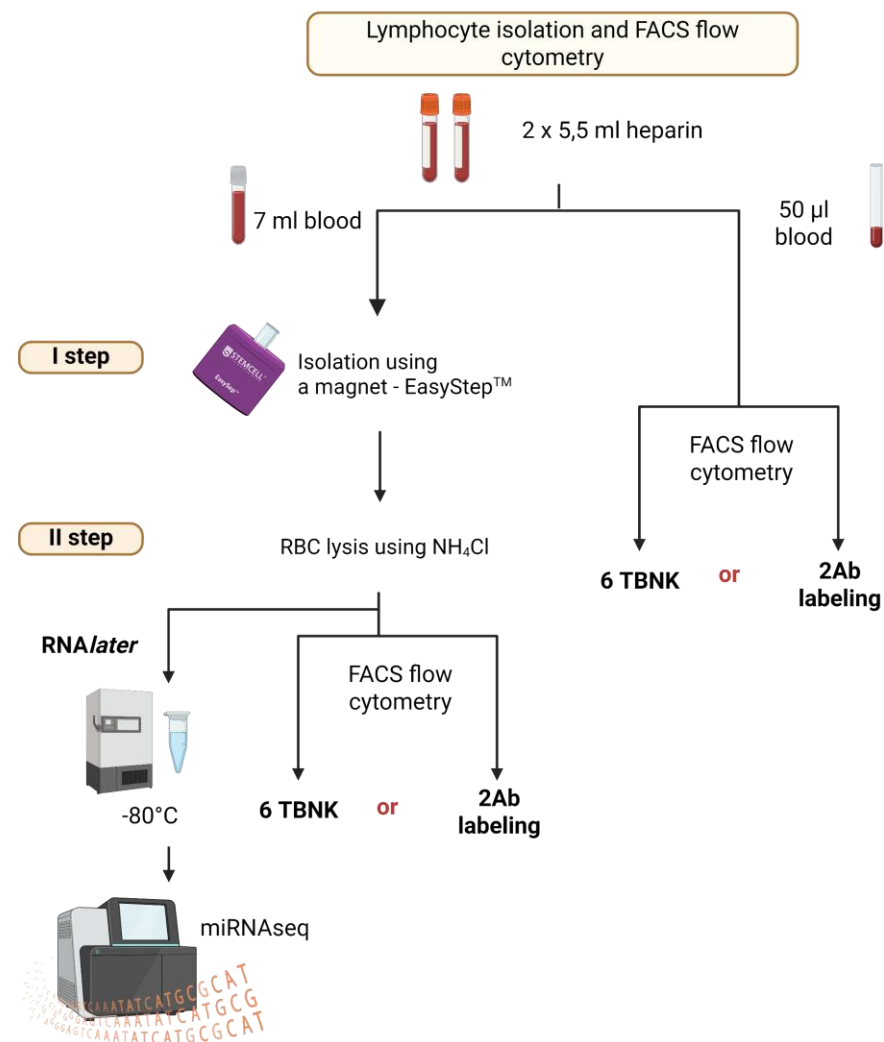
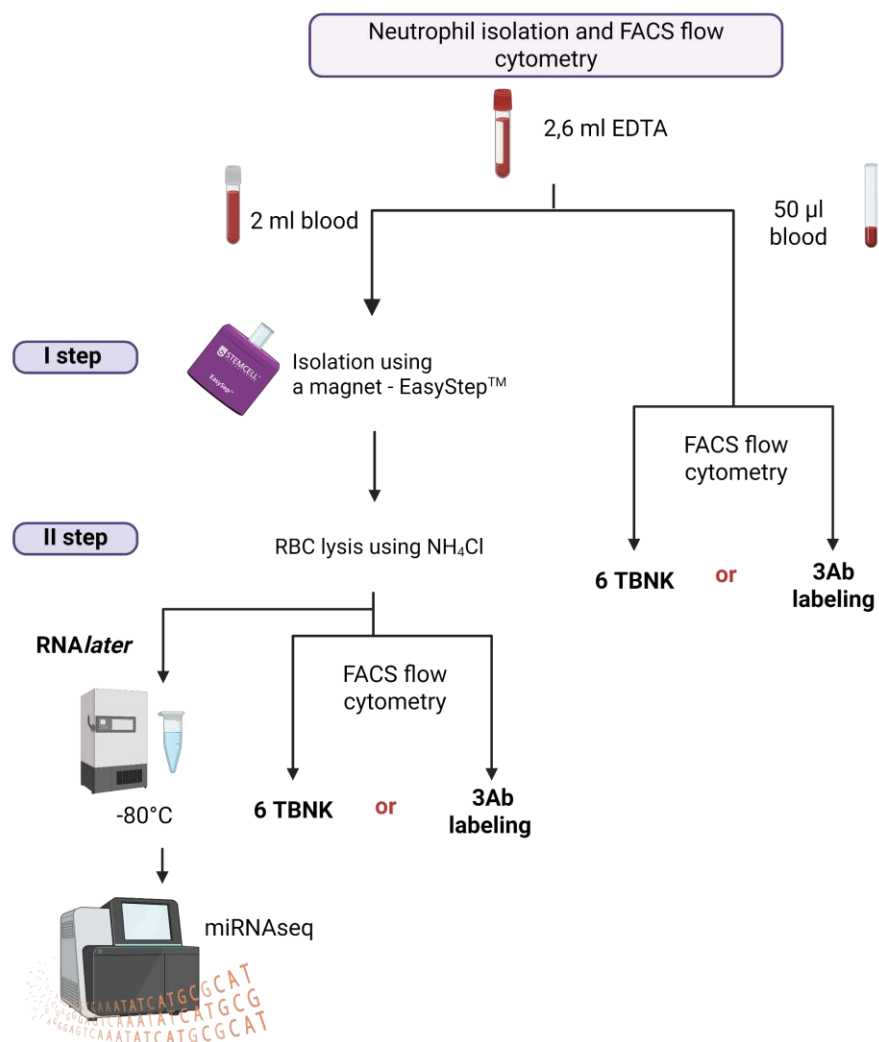
Fractionation of cells from peripheral blood vs serum

Aim: Comparison of the microRNA signature in neutrophil and lymphocyte cellular fractions versus the serum microRNA signature



**Obtained consent from the
Bioethics Committee**

Development of a protocol for fractionation





Bioethics Committee approval to conduct the pilot study



Creation of a lymphocyte and neutrophil isolation protocol for subsequent microRNA sequencing



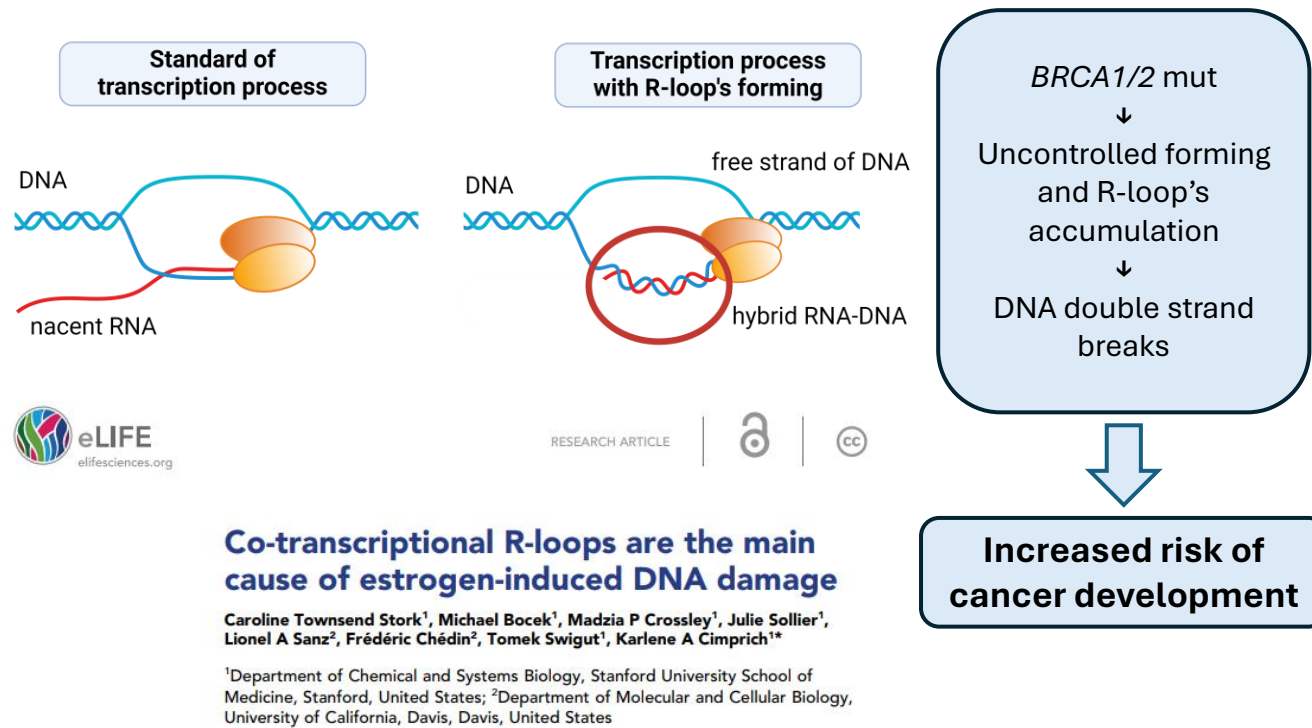
Purchase of reagents – in progress



Start of patient recruitment - planned start May-June

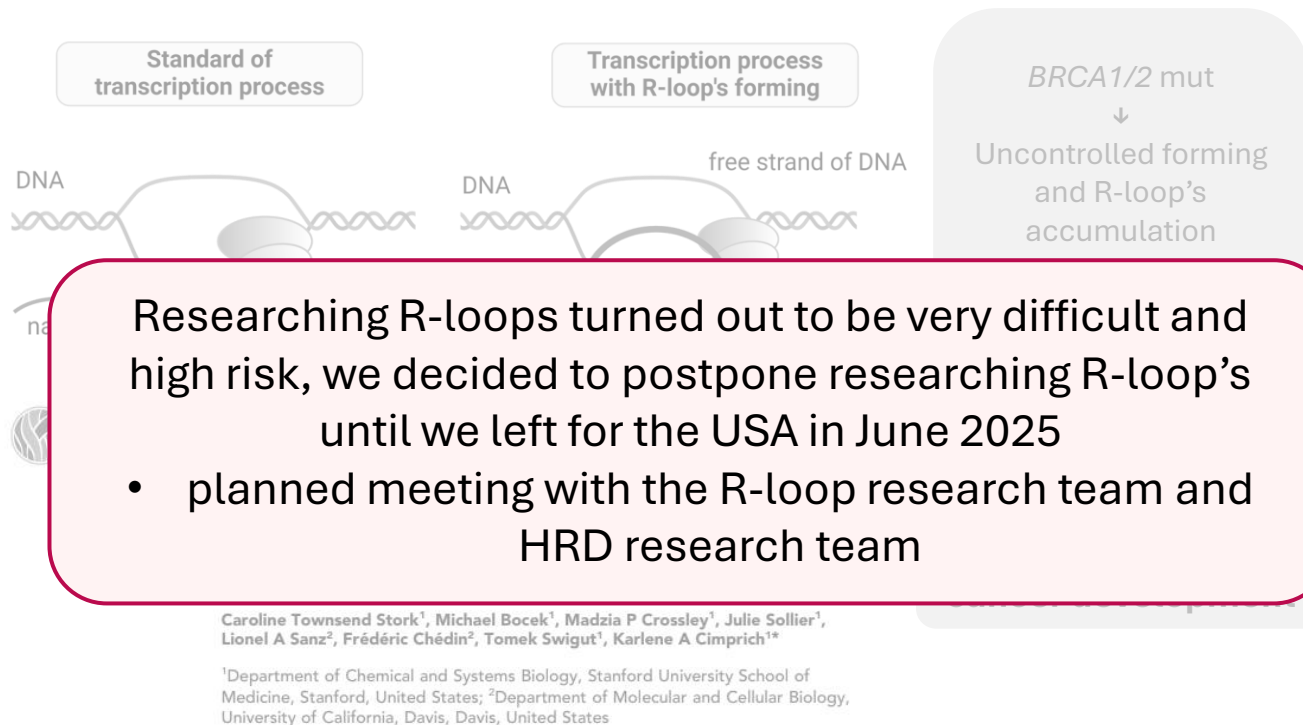
Relations between estrogen level, HRD and microRNA

My previous idea for exploring this relationship:



Relations between estrogen level, HRD and microRNA

My previous idea for exploring this relationship:



HARVARD
MEDICAL SCHOOL



Dana-Farber
Cancer Institute

Dipanjan Chowdhury, PhD
Harvard Medical School, Dana-Farber Cancer
Institute



microRNA signature in children with HRD



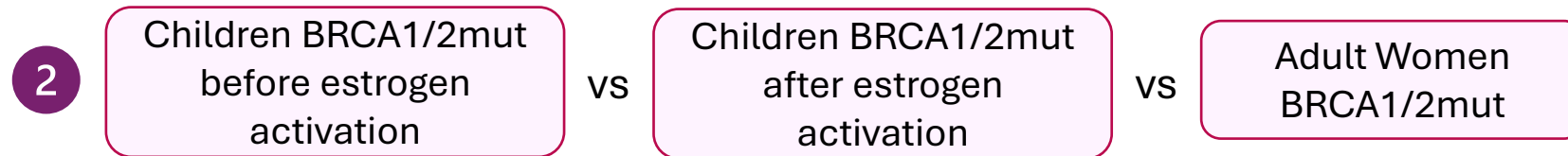
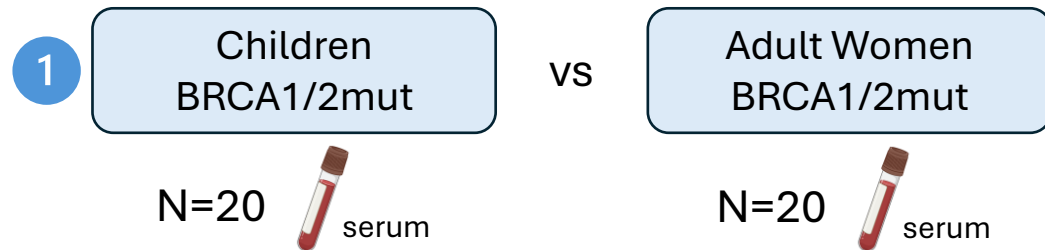
DReAMLand - DNA-REpair Associated
Malignancy biomarker **LAND**scape in
children

Prof. Agata Pastorczak, M.D., Ph.D.

Obtained consent from the
Bioethics Committee



Comparison of circulating microRNA signatures between:





Bioethics Committee approval to conduct the pilot study



Recruitment of adult patients with BRCA1/2 - in progress as part of the OPUS project



Conversations with centers recruiting children with BRCA1/2 – in progress



Purchase of reagents



Start of children with BRCA1/2 recruitment

My next tasks

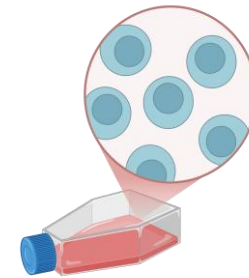


Preludium-24 Grant Application:

miRNA signature in children with
Nijmegen syndrome



A systematic review on the
effects of estrogen on HRD and
miRNA signature



Design of basic research on the
role of estrogen in HRD and
miRNA

Additional activities – first year of PhD 2024/2025



Professor Assistant and Didactics Coordinator at the Department of Biostatistics and Translational Medicine



Lecturer at postgraduate studies in „Elements of empirical research methodology and application of statistics in biomedical research”



Activities in the Doctoral Students' Self-Government Council of the Medical University of Lodz: **Second Vice-President for the Doctoral School of Molecular Medicine**



Member of the Strategy Team of the Medical University of Lodz



Member of the Commission for the Quality of Education, Medical University of Lodz

Additional activities – first year of PhD 2024/2025



Participant of the **TopMinds** mentoring program (mentor: Anna Jarząb, PhD)



Co-organizer and Coordinator of the PhD session at 21st International and 63rd Polish Conference "Juvenes Pro Medicina" 2025



Founder and Secretary of the Polish Association of Medical Biotechnologists (in the process of registration)



Biostatistician and subject matter expert in **4 clinical trials**



Team member in **3 grants**: OPUS-25, Gray Foundation, BRaIn grants (UMed)

Publications – first year of PhD 2024/2025

1. Cieślak Karol, Michalska-Kasiczak Marta, **Płoszka Katarzyna**, Stuss Michał, Sewerynek Ewa: Fracture risk assessment based on FRAX scores and Polish guidelines in patients with newly diagnosed osteopaenia, Endokrynologia Polska (Polish Journal of Endocrinology), vol. 76, nr 1, 2025, s. 66-73, DOI:10.5603/ep.103468
2. Stępień-Kłós Wioletta, Michalska-Kasiczak Marta, **Płoszka Katarzyna**, Stuss Michał, Sewerynek Ewa: Assessment of fracture risk based on FRAX score and Polish guidelines in patients with newly diagnosed osteoporosis, Endokrynologia Polska (Polish Journal of Endocrinology), vol. 76, nr 1, 2025, s. 74-81, DOI:10.5603/ep.102879
3. Tarhonska Kateryna, Wichtowski Mateusz, Wow Thomas, Kołacińska-Wow Agnieszka, **Płoszka Katarzyna**, Fendler Wojciech, Zawlik Izabela, Paszek Sylwia, Zuchowska Alina, Jabłońska Ewa: DNA Methylation and Demethylation in Triple-Negative Breast Cancer: Associations with Clinicopathological Characteristics and the Chemotherapy Response, Biomedicines, Multidisciplinary Digital Publishing Institute (MDPI), vol. 13, nr 3, 2025, Numer artykułu: 585, s. 1-17, DOI:10.3390/biomedicines13030585
4. Kacprzak Marta, Moczulska Hanna, **Płoszka Katarzyna**, Chrzanowska Marta, Sieroszewski Piotr: The impact of the COVID-19 pandemic on the course of miscarriages, Ginekologia Polska, Via Medica, vol. 95, nr 1, 2024, s. 62-66, DOI:10.5603/gpl.94772
5. Talar-Wojnarowska Renata, Fabisiak Adam, Zatorski Hubert, **Płoszka Katarzyna**, Błaziak Katarzyna, Fendler Wojciech, Rydzewska Grażyna, Małecka-Wojcieszko Ewa, Eder Piotr: Comparison of ustekinumab, infliximab and combination therapy in moderately to severely active ulcerative colitis - a study protocol of a randomized, multicenter, head-to-head COMBO-UC trial, Frontiers in Medicine, vol. 11, 2024, Numer artykułu: 1458998, s. 1-11, DOI:10.3389/fmed.2024.1458998

Thank you for you attention