

Research profile for applicants

Name of DKFZ research division/group:	Risk Adapted Prevention Group, Division of Primary Cancer Prevention (C120)
Contact person:	Mahdi Fallah, m.fallah@dkfz.de, Tel. +49 6221 42 3040
Group homepage: <i>Visit this website for further information on current research and recent publications.</i>	https://www.dkfz.de/en/praeventive-onkologie/index.php (click on "Risk-adapted Prevention - Mahdi Fallah")

RESEARCH PROFILE AND PROJECT TOPICS

Research Focus of Risk Adapted Cancer Prevention Group

Our group focuses on identifying individuals at high risk for common cancers, such as prostate, breast, and colorectal, in order to optimize screening strategies. Our objective is to develop and validate risk-adapted models to determine the optimal starting age for cancer screening based on individual risk factors such as race, ethnicity, family history of cancer, personal medical history and medication use, socioeconomic status, etc. Our goal is to improve cancer prevention and early detection by tailoring screening recommendations to specific patient populations. Our group currently consists of one postdoc and several PhD students, with the potential to grow. The leader of this group, Dr. Mahdi Fallah (MD, PhD), was a Professor of Medicine/Epidemiology in Norway and Adjunct Professor at the University of Bern, Switzerland and currently is a Visiting Professor at the Lund University, Sweden. The impact factors of our publications are: **10, 11 (×2), 13(×2), 14, 16 (×2), 19, 20, 26(×4), 28, 29 (×2), 45, 51 (×2), and 94 (×2)**; H-index=36; i10-index=68; >4370 citations. Dr. Fallah has developed two innovative risk-adapted methods to calculate the exact starting age of screening based on an individual's risk factors.

Potential Postdoc Project Associated with [International Alliance for Cancer Early Detection \(ACED\)](#)

This DKFZ Postdoctoral Fellowship project will initially focus on the race-adapted starting age of colorectal cancer screening. This postdoc position will be part of the big international ACED consortium, which is an approximately £50m partnership between the German Cancer Research Center (DKFZ), Cancer Research UK, Dana Farber Cancer Institute, University of



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Manchester, University College London, Knight Cancer Institute at OHSU and University of Cambridge. One potential postdoctoral project is to develop and refine/validate our risk-adapted model for initiating colorectal/prostate/breast cancer screening in individuals with certain characteristics related to cancer inequality, such as race, ethnicity, sex, reproductive profile, and socioeconomic status (occupation, education, income, etc.). The postdoc will have a co-mentor from another ACED partner institute in the US or UK. Participation in the ACED Alliance extends our impact in early detection by bringing together an international network of researchers who can pursue new directions beyond what a single institution could achieve. ACED has developed a program of rapid research funding that responds to the evolving questions in early detection. This program supports everything from pilot projects to large-scale initiatives, and brings in a new generation of scientists through training grants and educational opportunities.

Our group believes in an equity-based (risk-adapted) approach to cancer prevention, with a special focus on early detection and screening, rather than the current one-size-fits-all policy, in which all individuals start screening at the same age. An example of our first model for [race-adapted starting age of breast cancer screening](#) was published and press released by a JAMA Network journal with an exceptionally high Altmetric Attention Score of 910. It is in the **Top 0.1%** of the >28 million papers scored by Altmetric so far and went viral in more than 110 [news](#) outlets, such as CNN and Medscape. In that paper, we quantified how many years earlier than others, women of certain races/ethnicities should start breast cancer screening (e.g., Black women should start screening 8 years earlier than others).

Other potential research projects include risk-adapted screening for patients with certain colorectal cancer-related diseases. This will involve an in-depth analysis of the Swedish nationwide Family Cancer/Disease Database, which is the largest of its kind in the world. The goal is to identify additional risk factors and refine the risk-adapted cancer prevention models. This nationwide database contains information in more than 16 million individuals and their relatives with or without cancers and cancer-related diseases since 1964. It is crucial for us to evaluate the clinical utility of the model and develop implementation strategies by incorporating our findings into screening guidelines. Additionally, postdocs will have the opportunity to participate in international collaborations, such as data analysis of US SEER data, UK Biobank data, or the Utah Family Cancer Database, to strengthen the external validity of our findings.

Desired Qualifications

- Background in epidemiology, biostatistics, machine learning, mathematics, or bioinformatics
- Candidates with backgrounds in medicine, public health, pharmacology, or other related fields and experience in epidemiologic research will be considered.



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- Experience working with at least one common statistical package, such as SAS (preferred), Stata, R, SPSS, and/or machine learning techniques
- Significant contribution (e.g., first/last author) to several peer-reviewed English-language publications in reputable journals
- Previous experience in cancer epidemiology research or risk prediction is an asset.

Notes

- Join the Risk Adapted Cancer Prevention Group in the Division of Primary Cancer Prevention if you are passionate about science and want to address the following frequently asked yet unanswered question:
 - "What is my risk of developing cancer X in the next 5-15 years based on factors such as race/ethnicity, sex, family history of cancer X, personal history of disease/surgery/medication Y, as well as a certain socioeconomic status? How soon should I start cancer screening?"
- There are similar projects in our group for other cancers and risk factors. Each postdoc in this group is expected to work on one or two cancers and one or two exposures as his/her postdoc project. The cancer type and the inequality-related risk factor will be selected by mutual agreement between the candidate and the group leader based on factors such as the candidate's interest/motivation, research and educational background. Application for third party funding is encouraged. DKFZ Grant Office would help in grant application toward independency in research.
- The leader of this group has published >90 peer-reviewed publications (excluding abstracts/posters); several papers (mainly first/last author) in top high-impact medical journals: *BMJ* (×2), *Ann Oncol* (×2), *JCO*, *Gastroenterol* (×4), *JAMA Oncol* (×2), *Eur Urol*, *Blood*, *PLOS Med* (×2), *J Am Acad Dermatol*, *JAMA Net Op*, *JNCCN*, *Leukemia* (×2), *Science Bulletin*, *Am J Gastroenterol*, *JAMA Dermatol*, etc. Traditionally, all our team members publish in excellent journals.

Selected publications

1. Hu Y, Kharazmi E, Liang Q, Sundquist K, Sundquist J, **Fallah M**. Risk of **colorectal** cancer associated with frequency of colorectal polyp diagnosis in relatives. *Gastroenterology* 10:S0016-5085(25)00036-8. **Press released** by NCT/DKFZ. <https://doi.org/10.1053/j.gastro.2024.12.030>.
2. Liang Q, Mukama T, Sundquist K, Sundquist J, Brenner H, Kharazmi E, **Fallah M**. Longer interval between first colonoscopy with negative findings for colorectal cancer and repeat colonoscopy. *JAMA Oncol* 2024 DOI: <https://doi.org/10.1001/jamaoncol.2024.0827> (**Press released** by NCT/DKFZ; **Top 1% of Altmetric**; Selected as highlight publication of DKFZ);
3. Liang Q, Mukama T, Sundquist K, Sundquist J, Brenner H, Kharazmi E, **Fallah M**. Colonoscopy screening interval in relatives of patients with late-onset colorectal cancer: A nationwide matched cohort study. *Science Bulletin* 2024 0;69(6):732-736. <https://doi.org/10.1016/j.scib.2024.01.008> (**Press released** by NCT/DKFZ; Selected as highlight publication of DKFZ).
4. Chen T, Kharazmi E, **Fallah M**. Race and ethnicity-adjusted age recommendation for initiating breast cancer screening. *JAMA Netw Open* 2023 6(4):e238893. (**Press released** by DKFZ; Exceptionally high Altmetric Attention Score compared to >28 million scored papers so far (**Top 0.1% Altmetric**); Went viral in the [news](#) like CNN, Medscape, etc.).



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5. Kharazmi E, Scherer D, Boekstegers F, Liang Q, Sundquist K, Sundquist J, **Fallah M**[¶], Bermejo JL[¶]. Gallstones, cholecystectomy and kidney cancer: Observational and Mendelian randomization results based on large cohorts. *Gastroenterology* 2023 S0016-5085(23)00580-2.
6. Mukama T, Kharazmi E, Xu X, Sundquist K, Sundquist J, Brenner H, **Fallah M**. Risk-adapted starting age of screening for relatives of patients with breast cancer. *JAMA Oncol* 2020 6(1):68-74 (**Press released** by NCT/DKFZ; Selected as highlight publication of DKFZ).
7. Tian Y, Kharazmi E, Brenner H, Xu X, Sundquist K, Sundquist J, **Fallah M**. Calculating the starting age for screening in relatives of patients with colorectal cancer based on data from large nationwide data sets. *Gastroenterology* 2020 159:159–168 (**Press released** by NCT/DKFZ; Selected as highlight publication of DKFZ; Selected by Editor in chief for US CME; IF₂₀₂₁=34).
8. Xu X, Kharazmi E, Tian Y, Mukama T, Sundquist K, Sundquist J, Brenner H, **Fallah M**. Risk of prostate cancer in relatives of prostate cancer patients in Sweden: A nationwide cohort study. *PLOS Med* 2021 (18(6):e1003616. (Selected as highlight publication of DKFZ; **Press released** by the journal).
9. Ali Khan U, **Fallah M**^{¶(equal contribution)}, Tian Y, Sundquist K, Sundquist J, Brenner H, Kharazmi E[¶]. Risk of colorectal cancer in patients with diabetes mellitus: A Swedish nationwide cohort study. *PLOS Med* 2020 17 (11), e1003431 (**Press released** by NCT/DKFZ and Reuters News).
10. Ali Khan U, **Fallah M**[¶], Tian Y, Sundquist K, Sundquist J, Brenner H, Kharazmi E[¶]. Personal history of diabetes as important as family history of colorectal cancer for risk of colorectal cancer: A nationwide cohort study. *Am J Gastroenterol* 2020 115(7):1103-1109 (**Press released** by NCT/DKFZ; Reuters Health News and Medscape report on it).
11. Tian Y, Kharazmi E, Sundquist K, Sundquist J, Brenner H, **Fallah M**. Familial colorectal cancer risk in half siblings and siblings: nationwide cohort study. *BMJ* 2019 364:1803 (**Press released** by NCT/DKFZ; Selected as highlight publication of DKFZ; **Reuters** Health and many other websites; abstract **awarded by AACR**).
12. Kharazmi E, Hemminki K, Pukkala E, Sundquist K, Tretli S, Olsen JH, Tryggvadottir L, **Fallah M**. Cancer risk in relatives of testicular cancer patients by histology type and age at diagnosis: A joint study from five Nordic countries. *Eur Urol* 2015 68(2):283-9 (selected for CME credit).
13. **Fallah M**[¶], Kharazmi E[¶], Pukkala E, Olsen JH, Tryggvadottir L, Sundquist K, Tretli S, Hemminki K. Risk of familial classical Hodgkin lymphoma by relationship, histology, age, and sex: A joint study from five Nordic countries. *Blood* 2015 126(17):1990-5 (**Press released** by the American Society of Hematology Clinical News).
14. **Fallah M**, Liu X, Ji J, Försti A, Sundquist K, Hemminki K. Hodgkin lymphoma after autoimmune diseases by age at diagnosis and histological subtype. *Ann Oncol* 2014 25(7):1397-404.
15. Kharazmi E, **Fallah M**, Sundquist K, Hemminki K. Familial risk of early and late onset cancer: nationwide prospective cohort study. *BMJ* 2012 345:e8076 (Selected for **BMJ press release** on 21 Dec 2012: Cancer diagnosis later in life poses significant risk to offspring).



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