

The Department of Dermatology and Pathology plan to appoint a

PhD-student for ‘Integration of clinical data, Multi-omics and pathomics by artificial intelligence to imPROVe prognostic prediction of Early stage melanoma (IMPROVE)’

The departments of dermatology and pathology of the Erasmus MC plan to appoint a PhD student for research on early stage melanoma, which have a high risk of distant metastasis. This position for 3.5 years is financed by the KWF.

36 hours per week

Job description

The aim of this project is to identify patients with early stage melanoma (without metastases at initial diagnosis), who have a high risk of developing distant metastases (e.g. in the lung, liver or brain). We want to achieve this by combining multiple types of data from the primary tumor (e.g. DNA, RNA, infiltration of immune cells in the tumor and digital images of the histopathological slides). During this project you will collaborate with many researchers (e.g. bio-informaticians, epidemiologists, dermatologists, pathologists) from different departments of Erasmus MC (e.g. dermatology, pathology, surgery and oncology), project advisors from other universities (e.g. TU Delft) and a commercial partner (SkylineDx).

Part of the data that is used in this project is currently being generated for an ongoing consortium project of Erasmus MC, the Netherlands Comprehensive Cancer Organisation (IKNL) and SkylineDx. For this purpose melanoma samples with and without distant metastasis have been collected. During this project you will contribute to generating data on DNA mutations and histopathology of these samples. You will need (to develop) knowledge of gene mutations, Next Generation Sequencing (NGS) and histopathology. Knowledge on statistics and programming are needed as well to analyze the generated data. The first step of this project is that you carry out a systematic review and use data of online repositories to develop a targeted NGS DNA mutational panel. This panel will be used to investigate which DNA mutations are predictive for metastasis and to investigate the clonality between the primary tumor and the metastasis. The DNA isolation and sequencing is carried out by the molecular diagnostics department, but the NGS data will be analyzed by you. With regard to histopathology: together with a labtechnician you will annotate the melanoma in the digital histopathological slide, in order to prepare the images for analyses with artificial intelligence techniques. You will also assist the pathologist in scoring objectified and quantified histopathological features and you will analyze those data to develop a prediction model. You will work closely together with another PhD-student, who will apply artificial intelligence techniques to analyze the digitalized histopathological slides and to combine all data types (including DNA, RNA and the digitalized histopathological sections) in one model.

The final prediction model should be applicable in any pathology laboratory to identify patients at high risk of distant metastases at initial diagnosis for early intervention (e.g. increased follow-up or adjuvant therapy) to reduce melanoma mortality.

Work environment

At Erasmus MC we are working hard to improve today's healthcare and tomorrow's health. Pioneering, pushing boundaries and leading the way. In research, education and care. We work with the latest equipment, techniques and healthcare processes in a state-of-the-art building. The Erasmus MC is a large tertiary skin cancer referral center, where multidisciplinary care is provided to patients with skin cancer.

The Dermatology department focuses on many aspects of skin cancer research, such as skin cancer epidemiology by means of routinely collected health care data, clinical research and genetics of skin cancer and use of mHealth in skin cancer care. At the Pathology department, the focus is on digital histopathology, artificial intelligence, molecular pathology, but also (tumor) immunology. We are a multidisciplinary team of pathologists, dermatologists, bioinformaticians, (genetic) epidemiologists, immunologists and medical engineers and work closely with other experts from different research departments of Erasmus MC and (inter)national research partners. Prof.dr. Tamar Nijsten, Dr. Marlies Wakkee and Dr. Loes Hollestein lead the skin cancer research group in the Department of Dermatology. Dr. Andrew Stubbs, Dr. Yunlei Li and Dr. Antien Mooyaart lead the research on the use of artificial intelligence for cancer prognosis and treatment outcome models from multi-omics and histopathology data (Department of Pathology and Clinical Bioinformatics). You will collaborate closely with multiple PhD-students from both departments, who work on different aspects of (skin) cancer research. The aim of our research is to improve the care of cancer patients by, among other things: a personalized treatment (e.g. a prediction model to predict which patients will develop multiple skin cancers or personalized patient information), or raise awareness among policy makers to improve care (e.g. by describing epidemiology)

Qualifications and skills

You are a motivated candidate with an MSc. in Technical Medicine, Biomedical Sciences, Biomedical Engineering, Nanobiology or related discipline. You have excellent analytical skills and excellent writing and presentation skills in English. You are eager to solve complex problems, for example by programming and you are interested in "big data", digital histopathology and prediction models. It is important that you can work independently as well as in a team and that you can work in situations with varying work pressure. Good communication skills are important for working together with different departments of Erasmus MC, our partners (including IKNL and SkylineDx) and other research institutes.

Before you apply please check our [conditions for employment](#).

Terms of employment

You will receive a temporary position for 3.5 years. The gross monthly salary is € 2495,- in the 1st year and increases to € 3196,- in the 4th year (scale OIO).

- Study options, such as participation in courses offered by the Netherlands Institute for Health Sciences (NIHES) or Molecular Medicine (MolMed).
- Excellent fringe benefits, such as a 13th month that is already paid out in November and a personal travel budget.
- Pension insurance with ABP. We take care of approximately 2/3 of the monthly contribution.
- Special benefits, such as a physiotherapist and a company bicycle repairer. And there is also a sports club where you can work on your fitness after work.

The terms of employment are according to the Collective Bargaining Agreement for Dutch University Medical Centers (CAO UMC).

Information and application

For more information about this position, please contact Dr.L.M. Hollestein, epidemiologist, phone number: +31650032407 or e-mail: l.hollestein@erasmusmc.nl. For queries regarding your application, please contact Jerry Chandansingh, 06 500 310 06

If you are excited by the thought of this position and would like to apply, please do so by using the application form on our website.

<https://www.werkenbijerasmusmc.nl/vacature/53541/phd-student-voor-integration-clinical-data-multi-omics-and-pathomics-artificial>