nencki institute of experimental biology

Predictive Test for Non-Melanoma Skin Cancer

Problem

Skin cancers are by far the most common of all types of cancer in many developed countries. While most people have heard about melanoma skin cancer, the lesser known non-melanoma skin cancers (NMSC) constitute the **vast majority among skin cancers (96%)** represented in 80% by basal cell carcinoma (BCC) and in 16% by squamous cell carcinoma (SCC). The incidence of NMSC varies worldwide with the highest rates in Australia, and approx. 38.8-115.6/100,000 incidence in Europe for BCC only. **Dramatic increases in incidence** have been documented in recent decades (more than 300% since 1994)[1,2]. NMSC cause approx. 2,000 of people deaths each year in the United States alone[3], but many non-lethal cases require surgical treatment, which is painful and often disfiguring. Besides the mortality and direct public health impact of NMSC, specific studies have shown an **increased risk of other cancer types** after NMSC occurrence[4]. There are many environmental risk factors for NMSC such as exposure to UV light (including sunlight), immunosuppressant drugs, and viral infections (HIV, HPV). However, some people seem to be more likely to develop the disease as **genetic factors** also play a crucial role as risk factors in NMSC. Heritability for this type of cancer is particularly high; it was recently estimated at 43%, third highest among all the cancer types studied[5]. Although there are numerous skin cancer prediction tests, all of them are dedicated to melanoma, with **no prediction test for Non-Melanoma Skin Cancer being available so far**.

Solution:

We have evidence that **two genetic variants** occur with significantly higher frequencies in NMSC patients, in comparison with the general population. Based on this invention we have developed a **testing method for increased risk of NMSC predisposition**. The current test detects an increased risk of NMSC in human subjects being the **first-ever test** to detect a genetic predisposition to developing non-melanoma skin cancers. Our invention has been submitted for patent protection as PL20140410049 (2014), EP3083999 (2016), US201415106163 (2016), AU2014367369 (2016). **The US patent has already been granted.**

Product commercialization – licensing opportunity:

We are looking for a company to launch it to the market.

---

[1] http://www.skincancer.org/publications/sun-and-skin-news/summer-2010-27-2/nonmelanoma-skin-cancer-incidence
[2] http://www.who.int/uv/health/uv_health2/en/index1.html; Health effects of UV radiation
[3] http://www.cancer.net/cancer-types/skin-cancer-non-melanoma/statistics
[4] Rees JR, Zens MS, Gui J, Celaya MO, Riddle BL, et al. (2014) Non Melanoma Skin Cancer and Subsequent Cancer Risk. PLoS ONE 9(6): e99674. doi:10.1371/journal.pone.0099674
[5] Mucci LA, Hjelmborg JB, Harris JR, et al. (2016) Familial Risk and Heritability of Cancer Among Twins in Nordic Countries. Journal of the American Medical Association (JAMA) 315: 68-76
Created by Freestockcenter - Freepik.com

Project Core Team

Tomasz Wilanowski – principal inventor, molecular biology expert
Education: MSc at University of Warsaw, PhD at Australian National University
Head of Laboratory of Signal Transduction in Nencki Institute of Experimental Biology, Polish Academy of Sciences since 2009, formerly Senior Research Officer in Royal Melbourne Hospital, Australia (11 years). Author of four patent applications and 33 scientific publications, including the most prestigious scientific journals: Cancer Cell, Developmental Cell, EMBO Journal, Science and Nature Medicine.

Piotr Rutkowski – co-inventor and medical advisor.
Professor of Medicine (oncology), Head of Department of Soft Tissue/Bone Sarcoma and Melanoma, Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology in Warsaw. Member of American Society of Clinical Oncology (ASCO), Connective Tissue Oncology Society (CTOS) – Ex-Board member, European Society of Surgical Oncology (ESSO) and European Organisation for Research and Treatment of Cancer – Ex-Board Member (Chairman of Membership Committee). Author of over 100 scientific papers – cumulative IF >1200 (H-index 32).

About Nencki Institute

The Nencki Institute of Experimental Biology of the Polish Academy of Sciences is the largest non-university biological research center in Poland. High quality of research, excellent publication record, and strong international links place the Nencki among the leading biological institutions of Central and Eastern Europe. The main focus of Institute's research relates to novel therapies and diagnostic methods in diabetes, neurodegenerative diseases, neurological disorders, cancer and other diseases of modern civilization. The Nencki Institute also provide a wide range of services including preclinical trials, dermo-cosmetology studies, genetic engineering, transgenic animals production and biological imaging from electron microscopic to MRI levels. We appreciate the existing collaborations and **we are open to new cooperation with industrial entities to bring novel products to the pharmaceutical, biomedical and biotechnological market**.

nencki institute
of experimental biology

Contact
Urszula Rybak
phone (+48 22) 589 22 63
e-mail: u.rybak@nencki.gov.pl
Nencki Institute of Experimental Biology PAS
Pasteur 3, 02-093 Warsaw, Poland
http://www.nencki.gov.pl