QSKIN
Sun & Health Study

news

Welcome to the twelfth edition of the QSkin News

It has been quite a while since our last Newsletter (nine months in fact!). The team has been very busy in the intervening period. This twelfth issue of the QSkin News will update you on the activities that have been underway since you last heard from us. This includes providing you with findings from recent analyses and new publications, some of which have been recently reported in the media.

We also provide an update on the QSkin Genetics project. Enjoy the read, and as always, please let us know if you have any suggestions, comments or queries.

Best wishes.

Professor David Whiteman
Principal Investigator of QSkin

Sunscreen prevents DNA damage in human skin

There is now very strong molecular evidence that most keratinocyte cancers and cutaneous melanomas are caused by ultraviolet radiation (UVR) inducing mutations in genes. QSkin Investigators **Catherine Olsen, David Whiteman and Adèle Green** recently conducted a systematic review to examine whether sunscreens prevent DNA damage in human skin when applied prior to exposure to UVR. We identified ten experimental studies that measured DNA damage induced by UVR in human skin with and without sunscreen applied.

All studies reported markedly reduced or no DNA damage in skin protected by sunscreen. Our review provides consistent evidence that use of sunscreen prevents DNA damage in human skin cells, and therefore supports trial evidence that shows that regular use of sunscreen protects against the development of SCC and melanoma.

SOURCE: Olsen CM, Wilson LF, Green AC, Biswas N, Loyalka J, Whiteman DC. Prevention of DNA damage in human skin by topical sunscreens. *Photoderm Photoimmunol Photomed* 2017;33(3):135-142.

https://www.ncbi.nlm.nih.gov/pubmed/28165636

Risk tool validation study

You may remember that in Issue 11, we described the new clinical tool that we developed from QSkin data that helps doctors and patients predict their risk of newly developing a skin cancer. We are now in the process of trialling this tool in several skin cancer clinics across Queensland. The risk prediction tool performed impressively when we re-tested it in a separate random sample of QSkin participants, however we need to assess external validity.

That is, we need to determine how well it correctly predicts risk of developing skin cancers in people at their very first attendance at a skin cancer clinic. We will also assess the feasibility and impact of applying the prediction tool in clinical settings. In a collaboration with the Skin Cancer College of Australasia, we have secured five clinics across Queensland to help validate the risk tool, with 95 patients recruited so far.
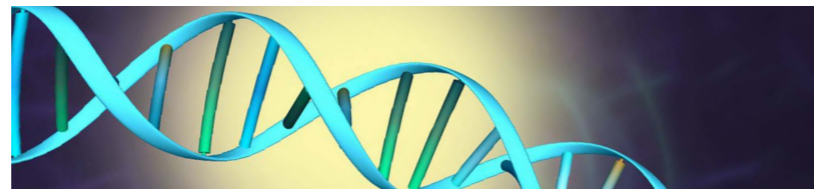
Preliminary analyses of the data collected are shown in the figure below. The results of this pilot study will inform further implementation of the risk tool in clinics across Queensland.

The new risk prediction clinical tool

**84%** 'strongly agree' that the tool was easy to use

93% 'strongly agree' that the instructions were clear

91% 'strongly agree' or 'somewhat agree' that the tool met expectations

Annual Meeting of the Skin Cancer College Australasia SCCA meeting

QSkin Chief Investigators David Whiteman and Catherine Olsen were invited to speak at the **Australasian Skin Cancer Congress** held at Surfers Paradise on May 19-21. David has also been awarded an Honorary Fellowship of the Skin Cancer College Australasia in recognition of his valued and enthusiastic contributions to the educational programs of the college.

QSkin Genetics Update

As you may recall, the QSKIN Genetics project was launched in September 2014 after several years of planning. Then began a hectic 18 months of mail-outs during which we contacted 42,690 QSkin participants and invited you to provide a saliva sample. The final mail out was posted in February 2016. A total of 20,925 of you responded positively and 18,627 saliva samples were returned (overall response rate – 43.6%) with sample collection closing at the end of October 2016.
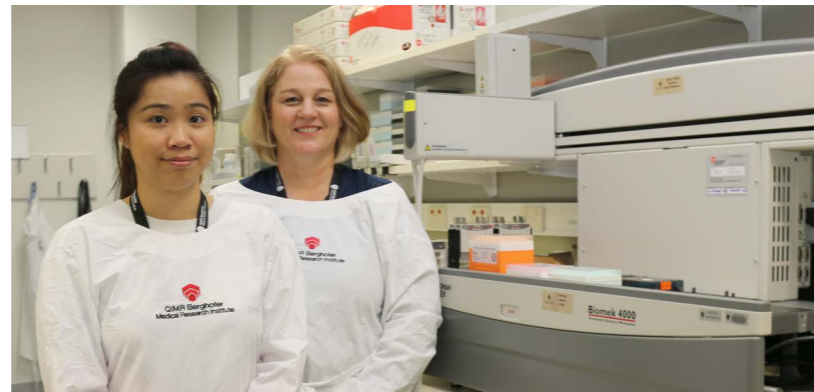
We would like to extend a huge "Thank you!" to everyone who participated in this extension to the original QSkin study. We would also like to thank the team who coordinated the process especially **Lea Jackman** and **Rebekah Cicero** from the Cancer Control Group and Lisa Bowdler from the Genetic Epidemiology Group who managed the receipt and processing of the many thousands of samples at QIMR Berghofer.

DNA extraction from the saliva samples took place in the impressive Sample Processing Laboratory at the Institute. **Susan List-Armitage** and her team including **Lisa Bowdler, Nadine Schulz** and **Vandhana Bharti** faced a mammoth task but after some initial technical difficulties with the extraction platform managed to extract DNA from all of the samples.

The DNA samples are currently being genotyped at the Human Genomics Facility (HuGe-F) at Erasmus MC University Medical Center Rotterdam.

QSkin publications

The incidence rate and multiplicity of keratinocyte cancers in Australia

We know that the incidence of skin cancer incidence in Australia is very high, but the true incidence is not known with certainty because these cancers are not 'registered' (or counted) by the cancer registries. This is because the cancer registries do not have the physical resources to count and check the volumes of pathology reports for skin cancer. QSkin researchers, led by **Dr Nirmala Pandeya**, therefore conducted an analysis using data from the national Medicare data overlaid with data from the QSkin study to estimate the incidence of keratinocyte cancers collectively, as well as by the different histologic types (i.e. BCC and SCC). The analysis focused on identifying demographic and geographic differences in incidence, as well as describing the 'multiplicity' of skin cancer events (that is, the numbers of skin cancers per person) in the Australian population.

Dr Pandeya estimated that about 7% of Australian adults had one or more skin cancers excised during a four-year period (2011-2014). Excision rates were higher in men than women, and increased dramatically with age. As expected, excision rates in Queensland were approximately double the National average, and three times higher than the southern states (Victoria and Tasmania). An interesting finding was that the vast majority of excisions recorded by Medicare in the time period examined (75%) occurred in a very small proportion of people (3%) who were affected more than once.

SOURCE: Pandeya N, Olsen CM, Whiteman DC. The incidence rates and multiplicity of Keratinocyte cancers in Australia. *Med J Aust.* (in press)

Smoking increases risk of Squamous Cell Carcinomas

QSkin PhD student **Jean Claude Dusingize**, in the most comprehensive and highest-quality study that's ever been conducted to examine the link between smoking and skin cancer, has found that current smokers were significantly more likely to develop a squamous cell carcinoma (SCC) of the skin than non-smokers. In contrast, there was no evidence that smokers had higher risks of BCC than non-smokers.

Jean Claude also found that among the smokers and former smokers, their risk of skin cancer wasn't affected by how long they had smoked for, how heavily they had smoked, or the length of time since they had quit.

We don't yet understand how smoking might increase the risk of SCC, but these findings strongly suggest that by quitting, smokers are lowering their risk of SCC to the same level as someone who has never smoked.

Jean Claude is now examining the relationship between smoking and the development of melanoma (stay tuned..!).

SOURCE: Dusingize JC, Olsen CM, Pandeya NP, Subramaniam P, Thompson BS, Neale RE, Green AC, Whiteman DC for the QSkin Study. Cigarette smoking and the risks of basal cell carcinoma and squamous cell carcinoma. J Invest Dermatol. 2017 Apr 13. pii: S0022-202X(17)31412-4.

https://www.ncbi.nlm.nih.gov/pubmed/28414022

Below are links to some of the media reports on this work:

https://twitter.com/7NewsQueensland/status/864762056976637953
https://twitter.com/tennewsqld/status/864749299271204865

Visiting Scientist – Loes Hollestein

I am a post-doctoral clinical epidemiologist from Rotterdam in the Netherlands. I described the burden of skin cancer in the Netherlands using Dutch cancer registry data in my PhD-thesis. The cancer registry data in the Netherlands has been linked to pharmacy data, which enables the study of the association between use of various commonly prescribed medications and skin cancer. Some medications may increase the risk of skin cancer because they make the skin more sensitive to sun-exposure. Others may be protective due to possible anti-cancer mechanisms. Together with colleagues from Australia, The Netherlands, Canada and The United States we aim to study the association between medication use and risk of skin cancer. I am visiting the QIMR Berghofer to contribute to the analysis of the QSkin study data. I am delighted to be part of this project, as QSkin is a unique study on a global level regarding the causes of skin cancer.

Chief Investigator David Whiteman: new Deputy Director of QIMR Berghofer

We were remiss in not reporting in our last Newsletter that QSkin Chief Investigator **David Whiteman** became the new Deputy Director of the Institute in July 2016, taking the reins from the outgoing Deputy Director, Professor Greg Anderson. In March this year David was also promoted to the level of Senior Scientist in recognition of his contribution to cancer research and public health and his leadership in the wider scientific community. Congratulations David on both appointments.

Feedback?

If you have any comments or updated information (e.g. change of address), please contact us:

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Have you received this newsletter by post and would rather receive it electronically? Please email us with your contact details.

How many melanomas might be prevented if more people applied sunscreen regularly?

QSkin researchers **David Whiteman, Adèle Green** and **Catherine Olsen** have conducted a study to estimate what would happen to melanoma incidence rates if people actually followed the advice to use broad spectrum sunscreen every time they went into the sun. Under the 'theoretical maximum' scenario (i.e. assuming everyone wore sunscreen all of the time starting today), then we estimated that total number of melanoma cases between now and 2031 would be about 34% lower for Australia (equating to a total of 96,417 prevented melanoma cases). Under a much more realistic scenario in which each year, an extra 5% of the population used sunscreen, we estimated that 28,071 fewer melanomas would arise in Australia out to 2031 (i.e. 10% less than would have occurred without the sunscreen intervention). These analyses demonstrate the power of primary prevention strategies in reducing melanoma burden. Whilst in these analyses, we focused exclusively on melanoma, we know that such interventions would also have a powerful effect on the incidence of SCCs, which are much more common in the Australian population.

SOURCE: Olsen CM, Wilson LF, Green AC, Biswas N, Loyalka J, Whiteman DC. Sunscreens and melanoma: potential impact of future interventions. *Br J Dermatol*. (in press)

QIMR Berghofer
Medical Research Institute