
5th International UV and Skin Cancer Prevention Virtual Conference

Abstract Posters

1 | Prevention of UVB-induced inflammation in human keratinocytes (HaCaT) by green tea, rooibos and honeybush herbal aqueous extracts: a comparative study

Rooibos (*Aspalathus linearis*) is a unique South African plant gaining popularity worldwide as herbal infusions and ingredients for functional foods, nutraceuticals and cosmetics. Rooibos contains a complex mixture of unique polyphenols known to prevent oxidative cell damage and modulate cell signaling pathways related to cell survival, playing an important modulating role during cancer initiation and promotion. The anti-inflammatory effects of unfermented rooibos extracts containing high levels of dihydrochalcones have been demonstrated in a UVB-irradiated keratinocyte model. Depending on concentrations, extracts displayed varying antioxidant or pro-oxidant activities indicative of direct and indirect anti-inflammatory properties when utilised before or after UVB exposure.

Authors | Dr Mariska Lilly, Prof WCA Gelderblom, Dr S Abel, Dr T Magcwebeba and Dr S Samodien, Cape Peninsula University of Technology, South Africa

2 | Use of Tanning Beds In Germany: Trends from four waves of the National Cancer Aid Monitoring (NCAM)

In 2009, tanning beds have been classified as “carcinogenic to humans” by the IARC. To monitor this oncologic risk factor, we established the National Cancer Aid Monitoring (NCAM). This unique representative monitoring enables us to describe tanning bed use, reasons for use, risk awareness, and user characteristics on an annual base. Each of the first four waves (2015-2018) contains data on 3,000 individuals aged 14 to 45. Current tanning bed use decreased from 2015 (11.0%) to 2018 (8.8%). However, in some subgroups prevalence increased (e.g., among minors despite a legal ban). Additionally, risk awareness decreased. This calls for further target-group-specific prevention and education.

Authors | Katharina Diehl, Sven Schneider, Rüdiger Greinert, Eckhard W. Breitbart and Tatiana Görig, Heidelberg University, Medical Faculty Mannheim, Mannheim Institute of Public Health, Social and Preventive Medicine, Germany

3 | Global differences between male and female melanoma incidence rates provide insights into the origins of melanoma

An analysis of sex-specific and site-specific trends in melanoma incidence over three decades for eight populations showed that the rate at which melanoma develops differed consistently by body site and age, and these site-specific differences were modified by sex.

The sex differences in melanoma incidence patterns across time and latitude suggest etiologic heterogeneity for melanomas arising on different body sites for men and women.

Authors | Catherine Olsen, John Thompson, Nirmala Pandeya and David Whiteman, QIMR Berghofer Medical Research Institute, Australia

4 | Quality of skin cancer screening in Germany – Preliminary results from a nationwide representative survey

In Germany, the skin cancer screening (SCS) is a key component of secondary skin cancer prevention. We aimed to describe patient-reported quality of SCS according to the specialization of the performing physician. Data from 1260 participants (35–65 years) who underwent SCS and participated in National Cancer Aid Monitoring in 2019 were evaluated. Dermatologists conducted the standardized visual inspection more carefully, offered consultation for skin cancer prevention and provided written information more often than other physicians. The identified differences in the provision of preventive information and the quality of visual examination during SCS emphasize the need for quality assurance measures.

Authors | Tatiana Görig, Sven Schneider, Rüdiger Greiner and Katharina Diehl, Mannheim Institute of Public Health, Social and Preventive Medicine, Heidelberg University, Germany

5 | Sunscreen use in Germany – Findings from the National Cancer Aid Monitoring (NCAM)

Use of sunscreen is an important element for preventing UV-induced skin damages. In our nationwide study, we researched whether recommendations on sunscreen use are followed in Germany. Data from 3,000 individuals aged 14-45 years were evaluated. Women, participants aged 36 to 45 years and those with fair skin used sunscreen significantly more frequently. 12.8% reported applying sunscreen at least 30 minutes before any sun exposure. 34.1% applied sunscreen just when being in the sun. 15.0% reported to never reapply sunscreen. Our study reports representative data on sunscreen use in Germany and shows deficits in this use for the first time.

Authors | *Tatiana Görig, Sven Schneider, Rüdiger Greiner and Katharina Diehl, Mannheim Institute of Public Health, Social and Preventive Medicine, Heidelberg University, Germany*

6 | Occupational sun safety practice versus policy

A sun safety policy is considered to be an important core element of a workplace's sun safety program. However, even when a policy is in place, implementing an effective program can still be difficult. In this presentation we will describe the sun safety practices in a large organization which has a detailed sun safety policy and guideline. A low level of compliance with the policy and guideline was observed during two surveys conducted in multiple years, highlighting the challenges for effective implementation of an a sun safety policy. As with other workplace hazards, for control measures to be effective, a strong safety culture is important including modelling and enforcement by supervisors.

Authors | *Thomas Tenkate¹, Isabella Leman-Viggers¹, Cyrus Lee¹, Anita Brobbey², Cheryl Peters²*

¹Ryerson University, ²University of Calgary

7 | Skin cancer awareness and drivers for sun protection in Black South Africans

Lack of early detection and understanding that skin cancer can affect people with pigmented skin on anatomic sites different from people with light skin may be the reason why individuals with darker skin often present advanced stages of skin cancer. The results of this study suggest a need for targeted skin cancer awareness and prevention among population groups with deeply-pigmented skin.

Author | *Caradee Wright, South African Medical Research Council, South Africa*

8 | Implications of the UVI: Evidence-Based Strategies for Community Sun Safety and Skin Cancer Prevention

This session, presented by SOLAWARE, will share recent data on programs conducted in recreational spaces to increase awareness, understanding, and application of the UVI and safe UV exposure behaviors. The study—which focused on people's behavior and knowledge regarding sun safety, UV awareness, and skin protection behaviors—yielded the following results: a complete understanding of the program as beneficial to people's behaviors regarding sun exposure; and, increased awareness and protective actions among the population with access to the program. The results imply that increased awareness about sun exposure and UVI leads to increased preventative actions against UV-related sun damage.

Authors | *Janelle Herbert, John DeMezzo and Christina McGrath, SOLAWARE, United States*

9 | Skin and Risk Activities Project: assessing the past looking for future opportunities

Authors | *Cristiana Fonseca and Patrícia Pinto*

10 | It's a burning question: Using a qualitative approach to unravel the context of children's sunburn occurrence in the Netherlands

Sunburn occurrence in early life is an important risk factor for skin cancer development, which makes sunburn prevention among children necessary. In this study, we provide insights in the context in which sunburns take place, in order to guide the development, optimization and targeting of future sun safety interventions.

Authors | *Karlijn Thoonen, Rowan Driittij, Liesbeth Van Osch, Hein De Vries and Francine Schneider, Maastricht University, Nederland*

11 | Trends in knowledge, attitude and behavior about sun-protection in persons aged 15-75 in France: Baromètre Cancer, 2005, 2010, 2015

In France, the Baromètre Cancer (BC), a nationwide repeated survey, makes it possible to study the use of sun-protective measures (SPM) to prevent excessive UV exposure during summertime, opinion and knowledge on the risks associated in the French population. Results were compared with those from the 2005 and 2010 BC, allowing for the study of trends over 10 years. Some results may reflect that standard prevention campaigns have failed to deal effectively with excessive UV exposure. It is advisable to change the environment to support healthy choices.

Authors | Anne Thuret, Colette Ménard, Christophe Léon, Jean-Baptiste Richard and Florence de Maria, Santé Publique France

12 | Trends of Sunbed Use and Characteristics, Knowledge, Attitude and Behavior In French Sunbed Users aged 15-75: Baromètre Cancer, 2010,2015

In France, the prevalence of the exposure for sunbed users (SU) is documented using the Baromètre Cancer (BC), a nationwide repeated survey in 2010 and 2015, among a representative sample of the French population. The secondary objectives of the BC were to describe the socio-demographic factors associated with sunbed use, and misconceptions, attitudes and awareness of risk among SU, compared with the non-users (NU). The observed results highlight the weaknesses of prevention with regard to UV rays, whether artificial or natural, and bring into play the discussion on banning sunbeds in France.

Authors | Anne Thuret, Colette Ménard, Christophe Léon, Jean-Baptiste Richard and Florence de Maria, Santé Publique France

13 | Tape Stripping the Stratum Corneum for Biomarkers of Ultraviolet Radiation Exposure at Sub-Erythema Dosages: a Study in Human Volunteers

Prevalence of skin cancer is rapidly increasing. There is a need for non-invasive biomarkers to assess efficacy of prevention strategies aiming at reduction of exposure to ultraviolet radiation (UVR). Stratum corneum (SC) markers as candidate biomarkers for UVR were explored. Twelve volunteers were exposed to a physical UVB-dose of 30 mJ/cm², broad UVB-spectrum spectrum (1 SED). As candidate biomarkers, cis-isomers of urocanic acid and 25 immunological mediators were measured in the SC. SC represents a promising, non-invasive alternative to skin biopsy in detecting UVR-induced changes. These candidate biomarkers might facilitate assessment of the efficacy of preventive measures in the workplace and general population.

Authors | Anne J. Keurentjes, Swen M. John and Sanja Kezic, Amsterdam UMC, location AMC, The Netherlands

14 | Knowledge, attitude and behavior about sun-protection among workers aged 15-64 old in France

The Baromètre Cancer (BC), a nationwide repeated survey into the French general population, makes it possible to study the use of sun-protective measures to prevent excessive UV exposure during summertime, opinion and knowledge on the risks associated in the French population. For the first time, the BC-2015 included questions at the workplace. Until recently, prevention aimed exclusively the general population, which might suggest wrongly that the danger lies exclusively in leisure activities. The issue of sun exposure is still little discussed in the workplace and in the different national plans.

Authors | Annabelle Lapostolle, Anne Thuret, Christophe Léon, Jean-Baptiste Richard and Florence de Maria, Santé Publique France

15 | Measuring UV-exposure in non-occupational times

In a previous large-scale project (Genesis-UV) occupational UV-exposure of more than 1000 people has been collected and analysed. Now as a follow-up, the UV-exposure of people in their leisure time will be measured. The goal of this project is to determine the mean UV-exposure during different leisure activities like cycling, hiking, or walking the dog, as well as the total average UV-exposure in non-occupational times. As a pilot project, we measured the UV-exposure during football matches. Since footballers are not allowed to wear any external equipment on their arms, referees were provided with the dosimeters instead. In this scope, we want to present the concept of the project and first results of the measurements.

Authors | *Timo Heepenstrick, Stephan Westerhausen, Marc Wittlich and Claudine Strehl, Institute for Occupational Safety and Health, Germany*

16 | Compliance check of UV-radiation from Norwegian sunbeds 2014-2018

Norwegian municipalities checked compliance with sunbed radiation regulations, i.e., erythema weighted total UV-irradiance below 0.3 W/m², using simple broadband radiometers.

Altogether, 10% of the measured sunbeds exceeded the limit in at least one part of the sunbed, due to incorrect equivalency coding (26%) or unknown/missing code on tube lamps or unknown high-pressure lamp type (40%). About one third of the violations had no obvious reason.

Checking the equivalency codes on the fluorescent lamps against the sunbed code range proved to be efficient to reveal noncompliance with the radiation requirements, whereas measurements are needed to check noncompliance for high-pressure facial lamps.

Authors | *Kirsti Bredholt and Lill Tove Nilsen, Norwegian Radiation and Nuclear Safety Authority, Norway*

17 | An appearance-based and a health-based intervention on 1300 French summer tourists' sun-protective behaviors evaluated in a cluster randomized crossover trial: the PRISME study

We implemented the PRISME study to identify the determinants of sun-protection of French summer tourists; and to compare the impact of two preventive interventions on tourists' sun-protection.

We conducted a cluster randomized crossover trial in summer 2019 to compare an intervention based on health messages (including phototype calculation) and one based on aesthetic messages (including ultraviolet photography), among 1355 French tourists from 12 to 55 years old in eight campsites. The effects of interventions were measured by questionnaires and skin color colorimeter just before and 4 days after the intervention. A second follow-up using an online questionnaire will be conducted in September 2020.

This study will permit to evaluate the efficacy of an appearance-based approach in France in a highly-exposed and socially diverse French tourist population and to identify vulnerable sub-population and mechanisms to improve sun-protection.

Authors | *Cécile Durand, Olivier Catelinois, Apolline Bord, Jean-Baptiste Richard and Marie-Laure Bidondo
Santé Publique France*

18 | Validation of Sun Exposure and Protection Index in German

The Sun Exposure and Protection Index (SEPI) is a brief instrument for scoring of sun exposure habits and propensity to increase sun protection. The reliability and validity of a German translated version of the SEPI has been analysed within a population of 205 university students. SEPI has been filled out and once again after three weeks. Internal consistency for the baseline responses was good and also a comparison with questions from the Vienna UV Questionnaire and the test-retest stability showed good correlation. Therefore, the German version of SEPI can reliably be used for mapping of individual sun exposure patterns.

Authors | *Elias Karlsson, Inga-Marie Hübner and Falk Magnus, Linköping university, Department of Health, Medicine and Caring sciences, Linköping, Sweden*

19 | A UV protection program for sports schools

Due to intensive sun exposure, many student athletes (SAs) have an increased risk for skin cancer. The CLEVER IN SUN AND SHADE program (CSSP) for sports schools was developed in 2019 using participatory program planning and following WHO recommendations for UV protection (UVP) at schools. CSSP for sports schools now consists of a project kit containing tailored videos targeting students, trainers, teachers and parents, as well as posters and a manual. The program enables sports schools to integrate UVP into their daily routine. Dissemination will start in 2021 in cooperation with German Olympic Sports Confederation and German Cancer Aid.

Authors | Friederike Stölzel, Michaela Wolff, Vera Fieber, Melanie Glausch, Eckhard Breitbart, and Nadja Seidel
National Center of Tumor Diseases (NCT/UCC) Dresden, Germany

20 | The Clever in Sun and Shade program - skin cancer prevention for preschools

Overexposure to ultraviolet radiation is a major risk factor for the development of melanoma, especially in childhood. The 'Clever in Sun and Shade-preschool program' (CPP) aims at reducing the risk for skin cancer by realizing setting-intervention recommendations. It consists of a media-based educational workshop for preschool-staff and a free project kit with materials applicable in preschool groups. The results of a cluster-randomized controlled trial with preschool-staff (N = 373) show that CPP can sustainably promote sun-protection behavior. A workshop solely guided by a DVD is already available, thus CPP offers high-quality information at low cost and an easy dissemination.

Authors | Nadja Seidel, Vera Fieber, Melanie Glausch, Michaela Wolff, Eckhard Breitbart, and Friederike Stölzel
National Center of Tumor Diseases (NCT/UCC) Dresden, Germany

21 | Pop-up sunscreen bar: Providing sunscreen on events and canvassing for new donors

In the Netherlands, during spring and summer seasons, a lot of outdoor events and festivals are being organized. During these events, visitors often forget to bring sunscreen or are not allowed to bring it inside the event area. Since the events are outside and last all day, the risk of sunburn occurrence is very high. With the pop-up sunscreen bar, the Dutch Cancer Society provides visitors of these events with sunscreen and educate them about sun protection and skin cancer. Moreover, this canvasses structural donors.

Authors | Kim Kruijt, Pim te Loeke, Karlijn Thoonen and Bart de Wolf, Dutch Cancer Society, Netherlands

22 | The role of DNA methylation as a potential mediator of genetic risk in skin cancer

Polymorphisms in pigmentation-related genes have been associated with an increased risk of skin cancer, however, the functional relationship between this genetic variation and disease is still unclear. This study investigated whether DNA methylation (DNAm) represents a link between genetic variants, skin cancer risk factors, and skin cancer. We examined 27 pigmentation-related SNPs distributed across 10 genes for association with DNAm sites and gene expression. We found that several DNAm sites near MC1R were associated with red hair. Additionally, the expression of ASIP and CDK10 was associated with melanoma and basal cell carcinoma.

Authors | Carolina Bonilla, Bernardo Berton, Josine L Min, Gibran Hemani and Hannah R Elliott
Departamento de Medicina Preventiva, Faculdade de Medicina, Universidade de São Paulo, Brazil

23 | EPA's UV Index – Using Digital Communication Tools to Promote Sun Safety

That there have been so many downloads of the EPA UV Index app and API hits over time strongly suggests there is growing interest in location-specific sun safety and UV Index information.

Authors | Robert Burchard and Robert Landolfi, United States Environmental Protection Agency, United States

24 | Visualisation of vessels through multi-spectral dermoscopy aids in differentiating A Typical Nevi and Melanoma

We conducted a study of the vasculature of clinically suspicious melanocytic lesions by means of a handheld dermatoscope with multi-spectral imaging producing images with increased blood vessel contrast (blood contrast maps). Blood contrast maps of 9 atypical nevi and 19 melanomas (7 in situ, 9 thin melanomas (Breslow < 1mm), 3 thick melanomas (Breslow ≥ 1 mm)) were evaluated. A homogenous dotted vessel pattern was observed in 8/9 dysplastic nevi and 3/9 thin melanomas. Irregular dotted vessels were noted in 1/9 atypical nevi and 15/19 melanomas. Linear vessels were observed in the majority of melanomas (12/19). Curved/arborizing vessels were observed in 5/19 melanomas. These preliminary findings are similar to previously reported data based on optical coherence tomography. Further research is warranted.

Authors | *Sofie Mylle, Isabelle Hoorens, Laudine Janssen, Evelien Verhaeghe and Lieve Brochez, Department of Dermatology, University Hospital Ghent, Belgium*

25 | Sunbeds and melanoma risk: many open questions, not the time to close the debate

Recent publications demand to “close the debate” whether moderate solarium use may increase melanoma risk and propose “actions against solarium use for skin cancer prevention”, because new studies would have convincingly demonstrated causality.

However, after systematic search and analysis of the scientific literature we were unable to prove that moderate sunbed use increases melanoma risk. Major previously published concerns have still not been adequately addressed. We conclude that demands “to close the debate” are not sufficiently supported by our present scientific knowledge, are not in accordance with principles of evidence-based medicine and do not fulfill the criteria proposed by Hill.

Author | *Prof. Dr. med. J. Reichrath, Saarland University Medical Center, Germany*

26 | Sunscreen use to prevent skin cancer – the good, the bad, and the ugly

Most guidelines and campaigns to prevent skin cancer recommend sunscreens. In a systematic literature search we investigated recently raised concerns about sunscreen use, identifying many reports that (a) show their transcutan absorption, detection in mother milk, in human placental tissue, and in the food chain, (b) question their efficacy, and (c) reveal potential risks associated with their use, including phototoxic/photoallergic dermatitis, hormonal activities (“endocrine disruption”), and toxic effects on ocean life including corral reefs. When deciding whether to use sunscreens, these reports need to be considered. Well-designed future studies to investigate efficacy and safety of sunscreens are urgently needed.

Author | *Prof. Dr. J. Reichrath, Saarland University Medical Center, Germany*

27 | UV Index and personal exposure measurement as parts of a risk assessment for outdoor workers

According to the German Occupational Safety and Health Act, employers in Germany are obliged to perform a risk assessment including hazards in relation to solar radiation. The erythemally effective exposure of various outdoor workers was determined by using personal electronic dosimeters and compared with the UV Index. The study revealed that at UV-level 4 or above, the majority of employees were at risk of sunburn. However, the risk of sunburn for the outdoor worker is individual and depends on the respective job characteristics. That must be taken into account in risk assessment.

Author | *Gabriele Franke, German Social Accident Insurance Institution for the energy, textile, electrical and media products sectors, Germany*

28 | UV Index Forecasting

This presentation is to inform the community on progress in UV Index forecasting developments at Environment and Climate Change Canada. These developments rely on an integrated meteorology and chemical data assimilation system being applied in near-real time since Summer 2019. This experimental system assimilates ozone measurements from different satellite instruments in addition to weather data. Diurnally varying UV Index forecasts covering multiple days are generated from the model's broadband UV surface irradiances calculated from the ozone and weather predictions. This presentation will give an overview of the UV Index forecast system, its ozone and UV Index products, and their assessment.

Authors | *Yves J. Rochon, Jean de Grandpré, Irena Ivanova, Michael Sitwell and Young-Min Cho, Environment and Climate Change Canada*

29 | Extending the use of real-time UV measures in school-based skin cancer prevention programmes: New tools for the self-discovery of SunSmart behaviours

We have significantly extended a SunSmart programme in which school children use real-time UV data acquired using electronic UV dosimeters and UV monitoring clothing to carry out their own investigations into the nature of UV radiation. Activities include investigating the protection provided by hats, clothing, shade, sunglasses, and sunscreen using data measured and analyzed by the students themselves. Lightweight solar-powered portable electronic displays are set up around the school, both during and for several weeks after the intervention, to continuously display UV levels and deliver SunSmart reminder messages to ensure that the lessons learnt are reinforced and retained.

Authors | *Martin Allen and Alana Hyland, University of Canterbury, New Zealand*

30 | Occupational skin cancer prophylaxis and risk awareness of employees working in swimming facilities in Germany

The contribution shows the findings of a survey of German pool attendants in 20 swimming pools in relation to their risk awareness and sun protective behavior. Thirty two percent of the employees reported that an occupational physician provided information on protection against solar radiation in the workplace. These employees participate more often in skin cancer screening programmes. Participants of this skin cancer programme demonstrate significantly higher risk awareness and increased awareness to use personal protection against solar radiation and sunscreen.

Author | *Gabriele Franke, German Social Accident Insurance Institution for the energy, textile, electrical and media products sectors, Germany*

31 | UV-Bravo: A new tool for behavioral monitoring and intervention

A new toolset called UV-Bravo allows researchers and health agencies to reduce the rate of skin cancer by tracking at-risk populations and enabling timely interventions.

Research-grade measurements of erythemally-weighted UVB, UVA, blue, green, red, and broadband white light are relayed from a dosimeter to a secured cloud database in real-time. Pedometry and physical activity are evaluated, using methods adapted from the scientific accelerometry package GGIR.

A smartphone app displays exposure data, records clothing and sunscreen use, monitors compliance, and provides reinforcing messages to guide behaviour. A web-based database uses AI to analyse data and raise alerts about risky behaviour.

Author | *Zim Sherman, Scienterra Ltd., New Zealand*