

## Better chemical filters for better life

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Ultraviolet-A and B radiation (UV-A; 315-400 nm, UV-B; 280-315 nm) constitutes only a small fraction of the solar irradiance at the Earth's surface, but its deleterious effects are substantial: DNA damage, with skin cancer incidence statistics for the UK showing ~15,000 new cases of malignant melanoma in just one year (2013). To alleviate such photodamage, off-the-shelf suncreams contain chemical filter molecules that absorb the UV radiation and dissipate it as heat. Despite the importance of these chemical filter molecules in photoprotection, the underlying mechanisms that convert UV-A/UV-B to heat are poorly understood.

The talk will discuss our 'bottom-up' approach to advancing our understanding of chemical filter molecules and their photoprotective properties, by studying how chemical filter molecules found in commercial suncreams respond to UV in the different environments of the gas- and solution-phase [1,2]. By pooling information gathered from each environment, the talk will demonstrate the rich information one obtains pertaining to the intrinsic properties of these chemical filters. Importantly, the talk will also highlight how insight into photoprotection mechanisms at the molecular level has the potential to make a societal contribution, not least in designing next generation, physically and environmentally benign, sunscreen products with enhanced long-term stability.

### References:

- [1] L.A. Baker, S.E. Greenough and V.G. Stavros, *J. Phys. Chem. Lett.*, **7**, 4655 (2016).
- [2] N.D.N. Rodrigues, M. Staniforth and V.G. Stavros, *Pro. R. Soc. A*, **472**, 1 (2016).