

Shinescreen – a truly sustainable sunscreen

Who are we?

- Hi! We are St Andrews iGEM 2020 or **Shinescreen** - a motivated team of undergraduates dedicating this summer to help **conserve coral ecosystems**
- Shinescreen is designing the first widely available **sustainable sunscreen**, building on other expensive and inefficient aquatic products

The problem

- Commercial sunscreens have damaging consequences for coral reefs; **10%** of coral ecosystems are susceptible to damage incurred by sunscreen leaching into oceans
- Certain agents such as oxybenzone and octinoxate used in chemical sunscreen cause **coral bleaching**, impair polyp growth and increase their susceptibility to viruses *in vitro*

Our solution

- We plan to implement an optimised gene circuit expressing a gene cluster for shinorine from cyanobacteria into a harmless strain of ***E. coli* - Nissle coli (EcN)** replete with a kill switch.
- These microbes will be suffused directly on the skin as a probiotic which, when exposed to light, will over-express shinorine while dying if it escapes the skin
- Our product will be a bioactive UV-protective layer with **'biointelligence'** - theoretically adapting to levels of light intensity and guarding the skin microflora