Smart second skin reduces eye bags and wrinkles – or so it seems

Old skin and young skin are physically different
Cultura RM Exclusive/Liam Norris/Getty

By Sally Adee

Had enough of those bags under your eyes? An invisible wearable polymer called Second Skin seems to act like a younger-looking layer of skin on top of your face. It lasts for days, and, over time, may even reshape your face, says the team that has developed the material.

“This would be Spanx for your face,” says Anne Lynn Chang, a dermatologist at Stanford University in California who was not involved in the research.

But others say they are sceptical, and cannot judge whether the material really does reduce sagging and swelling without seeing more evidence.

Young skin and old skin are physically different and people’s desire to turn back the clock has fuelled a multibillion-dollar make-up industry.

Young skin is thicker and scatters light beneath its surface, giving that unmistakeable, dewy glow of youth. Some creams can help older skin fake this by hydrating the outer
layer of dead skin cells that sit on top of the skin’s epidermis.

The differences aren’t just on the surface. Beneath the epidermis layers of the skin sits the dermis, which contains most of the collagen and elastin fibres that give your skin its elastic recoil and firmness. And after our teenage years, we lose the collagen at a rate of 1.5 per cent a year – and that’s without taking sun damage and smoking into account.

Collagen creams and consuming collagen are becoming increasingly popular for counteracting this – but there’s no convincing evidence that they work.

**Invisible skin**

Now Robert Langer at the Massachusetts Institute of Technology and his team, working with cosmetics spinout company Olivo, have developed a polisiloxane polymer that can mimic the properties of natural, young skin – including elasticity, and light reflectance and scattering.

“You don’t realise it’s on you,” says Langer. First, a silicone polymer cream is layered onto your face, then a platinum catalyst is painted on, which crosslinks the molecules in the cream. The resulting skin is reportedly breathable, locks in moisture and scatters light. A 25-person pilot study has found that it can be worn for more than 24 hours without discomfort.

The team says it systematically built the polymer to match young skin’s stretchiness, its reflectivity and its ability to return to its former shape when you pull it.

“No wonder it took nine years,” says Adam Perriman, who works on biomaterials for regenerative medicine at the University of Bristol, UK. “They really took the time to look at all the parameters of skin.”
Eye bags and turkey neck
The Second Skin is slightly more contractile than the real thing, pulling the skin it is painted on. When painted onto the bags under your eyes, the skin tightens, and the wrinkles around it appear reduced (see picture below).

The team says the material could have other uses. “I can see people really wanting this for ‘turkey neck’ that happens as you age,” says Chang.

*New Scientist* arranged a visit to see the material last week, but it was cancelled because of a problem with polymer availability. This means that the only visible evidence of the material in action are the few photos and a video (see below) that the team has produced.

The researchers told *New Scientist* that pictures they published as part of their study have not been retouched to alter the appearance of the treated under-eye area. But the resolution is too low for other researchers to confidently judge the effects of the Second Skin.

It is hard to tell what the polymer is doing to the skin, says Christopher Griffiths, a dermatologist at the University of Manchester, UK. It could be pushing the fat under the eyes backwards, or it might be suppressing fluid-based swelling. “I’m not sure what’s being improved,” he says.

“The fact that you haven’t got your hands on it is enough for caution,” says Griffiths. “I have some concerns about people using this themselves,” he says. “I still think it would be tricky to do this at home.”

Eczema treatment?
The Second Skin may improve the structure of a person’s own skin with repeated use, Langer says, but he is reluctant to go into detail until he has conducted more studies.

It’s not that implausible. “Heavily hydrating like this over time could really make the skin start to look better,” says Perriman. “The forces exerted will realign collagen fibres and improve elasticity.”
“We’re not sure yet whether this is going to be targeted for medical use or cosmetics,” says Daniel Anderson of MIT.

He says it could be useful for psoriasis and eczema, extreme cases of which people often attempt to combat with petroleum jelly or cling film/saran wrap.

If Second Skin is to be sold as a cosmetic in the US, the Food and Drug Administration would need to see evidence that the polymer is not harmful. But if it is to be used as a medical product, studies will also be needed to show that it works.

But for those who want a solution right away, there is evidence that retinoid compounds like Retin-A can repair the skin’s elastin and collagen networks, and some readily available creams already contains these – no platinum-cured polymer coating required.

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