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Revealing the skin microbiota

1. Is drinking a glass of yoghurt like a drop in the sea with limited effect on health?

Yes. In fact the European Food Safety Authority (EFSA) has repeatedly refused to allow probiotic companies to claim any health benefit for their products. This has really upset the yoghurt companies but the EFSA say that they've reviewed the available data and have concluded that there is no evidence to support any health benefit claims for probiotics. <http://www.loc.gov/law/foreign-news/article/european-union-food-safety-authority-dispels-health-claims-by-companies-making-yogurt-and-energy-drinks/>

2. What's the amount of "probiotics" that would induce an effect?

The scientific panel of the EFSA has stated that there is no evidence that probiotics induce any health effect, so the question has no meaning.

3. Is there a difference for microbiota for skin vs scalp?

Yes, there certainly is. Each region of the skin has a different microbiota. The scalp has a microbiota that is different from all other skin regions. The microbiota of different regions of the skin is described in one of my books "Bacteriology of Humans"
<http://eu.wiley.com/WileyCDA/WileyTitle/productCd-1405161655.html>

4. Do we need probiotic-enriched products?

I think that probiotic-containing cosmetics could possibly play a role in maintaining a healthy skin microbiota as well as correcting imbalances in the skin microbiota that are associated with certain skin conditions such as eczema etc. However, we need to know more about the nature of the skin microbiota that is compatible with skin health (i.e. the eubiotic skin microbiota) as well as what happens to the skin microbiota when it is dysbiotic i.e. associated with adverse skin conditions.

5. Do commensal cutaneous microbes make a meaningful contribution to the maintenance of skin health?

Very little research has been carried out in this area. However, there are some indications that the skin microbiota does contribute to skin health by: (i) preventing colonisation of the skin by pathogenic microbes, (ii) producing vitamins such as vitamin B12, riboflavin and folate, (iii) producing glycerol and fatty acids that respectively, improve skin moisture retention and help to maintain a low pH condition on the skin surface, (iv) priming the skin's innate and acquired immune systems.

6. What is your opinion of live dead differentiation for PCR using propidium monoazide?

I haven't used this technique, but it seems to be a very promising approach.

7. Why do you seem to be against the use of lactobacillus on the skin?

Lactobacilli are very rarely found on the skin and are certainly NOT part of the skin microbiota of healthy individuals – the main skin microbes are staphylococci, propionibacteria and corynebacteria. So why on earth would anyone want to repeatedly dose the skin with lactobacilli? What do they expect the lactobacilli to do? What benefit could they possibly achieve? I have not heard any advocate of using lactobacilli on the skin explain what the lactobacilli are supposed to do there or how they could possibly help in any way. I would love to hear the reasoning behind this suggested approach. Lactobacilli are found in the gut therefore there is a rationale for attempting to use them as probiotics to contribute to gut health (although there is little evidence to support them having any effect). This makes sense.

Introducing any microbe that is not part of the resident microbiota of a particular body region to that region is potentially dangerous as it is very difficult to predict what it would do to the microbial communities that reside there. Good examples of the potential dangers of interfering with an ecosystem by introducing a species that is not native to that ecosystem are the introduction of the sugar cane toad to Australia, the introduction of Japanese knotweed to the UK, the escape of rats onto islands and so on.

The skin microbiota is a balanced ecosystem and it is difficult to predict what would happen if it was repeatedly swamped with a microbe that doesn't usually live there. The resident microbiota at any site has a strong ability to repel any organism that does not belong there – this is known as "colonisation resistance" and is one of the body's most effective means of preventing infection. Hopefully, the intrinsic colonisation resistance displayed by the resident skin microbiota would prevent lactobacilli from colonising the skin – but who knows? If the skin is repeatedly assaulted by huge numbers of lactobacilli daily, perhaps its colonisation resistance would break down.

8. Do you believe maintaining the balance of the skin's ecosystem is the way forward?

Yes, absolutely. But a lot more understanding of this ecosystem is needed before we can come up with any ideas on how to achieve this.

9. Is there a correlation between a higher amount of Malassezia on the skin and skin conditions like adult acne & rosacea?

The main skin conditions associated with increased proportions of Malassezia species include folliculitis, seborrheic dermatitis, dandruff, psoriasis, papillomatosis and atopic dermatitis. However, the evidence in support of a role for these fungi in many of these conditions is not very strong.

10. Do we know what a healthy skin microbiome is?

No, we are a very long way from being able to define the nature of a healthy skin microbiota at any of the numerous body sites. Modern culture-independent techniques will certainly be a big help in determining the skin microbiota but currently few such studies have been carried out and the numbers of individuals involved have been extremely small.