The amazing world of the skin-gut axis, including the role of the microbiome“

- by Marcelline Goyen BSc Skin therapy © 9-2024

Foreword

There’s quite a lot of attention these days for the concept of ‘axes’. The gut-brain axis, the hypothalamus-adrenal axis, the placenta-brain axis and so on. So it is not that surprising to discuss the skin-gut axis, as these are the two ’sheets’ with which the individual interacts with its environment. It is also in line with evolutionary expectation, as the skin and the intestines (’the inverted outside’) have had to cope with the same challenges and threats from the environment. Experienced and reflective skin therapist Marcelline Goyen takes you on an engaging journey through these organs and the connections they have with the microbiome and the immune system. Permeated with examples from her many years of practice, she addresses the anatomy and physiology of both the skin and the gut and all topics that intertwine the function of these organs but also in their reciprocal relation with the microbiome, the immune system and, therefore, one’s general well being and health. The text is worth reading for all with an interest in health care in general and skin care in particular. It is thought-provoking, immersive and inspires the reader to contemplate about the intricacies brought about by these seemingly unrelated organs and their role in the health of the entire organism.

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Introduction

"A healthy skin comes from both outside and inside!"

How would it be if your skin could function completely on its own? That is, if your skin could operate and survive independently and without help from the rest of the body? Does that sound logical? No, right? In my view, it certainly doesn't, because the skin needs nutrients to nourish itself and the microorganisms present on it. It also needs a system to deliver nutrients and remove waste products. This happens via small blood vessels that connect to larger blood vessels, which then lead to the intestines where nutrients, released from the digestion of food and drinks, can be absorbed and transported to all cells.

Additionally, the skin requires a nervous system and brain to perceive and res-pond to signals such as touch, pain, pressure, heat, or cold. This allows you to quickly pull your hand away if you touch a hot pan; otherwise, your skin would burn. The signals that help you with this, such as the perception of temperature and experiencing pain, occur in the skin but cannot be ‘translated’ within the skin itself. You need nerves, nerve conduction, and a connection to your brain to act quickly and appropriately and, ideally, also to make you comprehend what is happening.

And we often forget the role of our immune system, or our defense system, supported by all the microbes living on our skin and in our body.

In short, the skin does not stand alone and, as the largest visible organ of our body, is an essential part of the body, composed of countless cells that belong to various tissues, blood vessels, nerves, organs, bones, and the brain. All these cells, structures, and organs cannot live independently without the help or cooperation of other organs and tissues, such as for the delivery of nutrients and information. Furthermore, we, as humans, don't stand a chance of survival with-out a well-functioning immune system that ensures our defense works when needed. This includes instances like a cold or flu, a nasty intestinal parasite, a food infection, a severe bone fracture, or a cut in the skin, and all other moments when the body is out of balance. Your brain also plays a significant role in this, both consciously and unconsciously.

Fortunately, we don't have to think about how our blood vessels should react or when a particular enzyme needs to be released to help digest food or to mature skin cells. Most processes in our body happen without our awareness, and that’s a good thing. Even when we think consciously and take action, we are supported by our subconscious processes such as breathing, the flow of blood and lymph in blood vessels and lymph vessels, the beating of our heart, hormone regulation, and our immune system.

Almost 100 years ago, dermatologists Stokes and Pillsbury were far ahead of their time when they proposed a ‘Gut-Brain-Skin’ theory in 1930. They wrote about the relationship between gut problems (gut), emotional issues (brain), and the skin condition acne vulgaris (skin). It is remarkable that this theory has only been taken seriously in recent decades and has been brought back to the attention of the research community. Their theory is now being underpinned with evidence and explained from various perspectives, such as the immune system and our microbiome. It has been found that digestive problems, such as in the stomach and intestines, and emotional imbalances like depression are more common in people with acne vulgaris than in healthy individuals.

Even more astonishing is that, in 2024, many people still think that the skin has no (clear) relationship with the gut. Unfortunately, even many doctors, including dermatologists, seem to view the connection between the skin, the gut, and our lifestyle as ‘not relevant to the skin itself’. The fact that this relationship is indeed present in many remarkable ways was extensively described in my first book, thanks in part to the researchers who have been exploring these themes in recent years.

The key role in this is played by our microbiome, which has only garnered increasing attention in recent decades. As a 'host', we humans, together with our microbiome, form a holobiont (from the Greek: “holos = whole). This indicates that on all conceivable 'axes' interrelations take place that we are only just learning to understand, so we’re just scratching the surface in this book. The microbiome encompasses all the living and dead microorganisms and their produced substances that live in and on our bodies, contributing to our healthy balance and sometimes to imbalance or disease. Although this microbiome is not human, it is often referred to as our ‘external organ’, with which we come into contact even before birth in the womb and via the umbilical cord, especially during and after birth. Without this organ, we cannot live, let alone survive. After birth, exposure to microbes increases significantly, causing our microbiome to grow like a tsunami in numbers and species until it eventually becomes a mature and stable community.

The microbial ‘little beings’ living in our microbiome, which are part of our healthy ‘external organ’, help us communicate between different organs and tissues, allowing signals to be sent and responses to be triggered even from a distance. Together with our immune system, they contribute to our health. In unfavourable circumstances, they also contribute to disease through the presence of pathogenic bacteria, fungi, viruses, and parasites. But don’t be alarmed. We constantly encounter a vast number of different microorganisms without even noticing, and we usually don’t get sick from them. Our body is fortunately smart and complex in its defense mechanisms, able to maintain or restore a healthy balance in most cases, even after a disruption like an invasion by harmful bacteria or parasites.

In this book, I will describe and explain several of these processes step by step, so you can better understand that the skin does not stand alone and is even dependent on you and your behaviour. If you have a skin condition like eczema, acne, psoriasis or rosacea, I hope you will also consider your digestion and intestines in relation to your diet and lifestyle, including factors like stress, burnout, etc. The expression ‘not feeling comfortable in your own skin’ is influenced not only by what you do and what happens inside you but also by what you think and feel.

I wish you a wonderful journey into the fascinating and complex world of the skin-gut axis.

Marcelline Goyen