Colorized scanning electron microscopic view of a cross section of human skin reveals multiple layers.
Skin
From bench to bedside

by Stella Hurtley, Pamela J. Hines, Kristen L. Mueller, and Elizabeth Culotta

Skin is frequently referred to as the largest organ in the body. Our skin protects us from the elements; it is through our skin that we interact with our environment, and it is a crucial part of how we present ourselves to the world, from tanning and tattoos to scars and wrinkles (see linked videos). The basic biology of the skin (Watt, p. 937) involves a multitude of cell types, all of which cooperate to form the organ we all inhabit. When skin is wounded, a repair process is instigated to breach the gap, and ancient and modern approaches to promoting wound healing have saved countless lives (Sun et al., p. 941). Anthropologist Nina Jablonski, profiled by Ann Gibbons (p. 934), studies the evolution of skin color and has found that a surprising number of people face health consequences from having a skin tone poorly adapted to their current environment. A stark example of this is malignant melanoma. Melanomas often appear on exposed skin, and new approaches are finally starting to provide hope for successful treatments (Lo and Fisher, p. 945). Our sense of touch is key to how we respond to and interact with our environment. Different types of nerve endings within the skin provide us with a variety of sensations, from pleasurable to painful (Zimmerman et al., p. 950). Besides protecting us, our skin also provides a habitat for a host of microbes—many helpful, some less so (Belkaid and Segre, p. 954). In this special issue of Science, we present an overview of some of the basic aspects of skin biology and how advances in our understanding are leading to positive benefits in the treatment of skin conditions, wounds, and diseases.
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