



## ABSORPTION (SKIN / DERMAL)

**A**long with inhalation, ingestion, and injection, **dermal absorption** is a route of exposure for toxic substances and route of administration for medication, depending on a number of factors - the most important of which are concentration, duration of contact, solubility of medication, and physical condition of the skin and part of the body exposed, and occurring from occupational, environmental, or consumer skin exposure to chemicals, cosmetics, or pharmaceutical products. Some chemicals can be absorbed in enough quantity to cause detrimental systemic effects. Skin disease (dermatitis) is considered one of the most common occupational diseases. In order to assess if a chemical can be a risk of either causing dermatitis or other more systemic effects and how that risk may be reduced one must know the extent to which it is absorbed, thus dermal exposure is a key aspect of human health risk assessment.

To be absorbed through the skin, a chemical must pass through the epidermis, glands, or hair follicles. Though small amounts of chemicals may enter the body rapidly through the glands or hair follicles, they are primarily absorbed through the epidermis and they must pass through the seven cell layers of epidermis before entering the dermis where they can enter the blood stream or lymph and circulate to other areas of the body. Toxins and toxicants can move through the layers by passive diffusion. Lipid-soluble chemicals make it through the layer and into the circulation faster, however nearly all molecules penetrate it to some minimal degree.

The amount of chemical that is absorbed through the skin can be measured directly (*in vivo*, *ex vivo*, *in vitro*) or indirectly. Studies have shown there are species differences in the absorption of different chemicals. Measurements in rats, rabbits or pigs may or may not reflect human absorption. Finding the rate at which agents penetrate the skin is important for assessing the risk from exposures.

**For further reference - [https://en.wikipedia.org/wiki/Absorption\\_\(skin\)](https://en.wikipedia.org/wiki/Absorption_(skin))**