NON-INVASIVE MONITORING OF IR-ACTIVE SAMPLES IN OPAQUE MATERIALS

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HINTERGRUND

Concentration monitoring of IR-active contents in blood or interstitial liquid in the epidermis represents a valuable tool to determine the diffusion of dermally applied drugs and cosmetics. While skin invasion is crucial for drug agents, it should be prohibited for cosmetics. To monitor these processes non-invasively enables a huge variety of new applications.

LÖSUNG

By taking advantage of photothermal deflection enhanced by total internal reflection, it is possible to overcome the above-mentioned limitations of non-invasive spectroscopic methods. In the novel setup the pump beam's penetration depth is only limited by the absorption coefficient and the thermal diffusion length of the (biological) sample. Hence it provides insights to the concentration of IR-active substances, e.g. lipids, alcohol or proteins for layers up to 4 µm deep within the human skin. Additionally, it is possible to gain IR information by VIS detection. Hence the employed optics and detectors are cheaper and easier to handle in comparison to commonly used IR setups.
VORTEILE

Monitoring of IR active molecules non-invasive in opaque samples with improved skin penetration depth in vivo. Use of cheaper VIS optics and detectors. Analysis of thermal properties of sample possible.

ANWENDUNGSBEREICHE

Monitoring of lipids, proteins or metabolics in human epidermis. Tracking of diffusion into the skin of drugs and cosmetics.

SERVICE

Licensing or assignment of the technology is possible as well as a cooperation for further development of the invention.