



# CONNECT

## Digital biopsy

### Background

The Munich-based medical technology company VivaScope sees itself as a market specialist in the development and sale of confocal laser scanning microscopes. The products are used in various clinics worldwide and support medical professionals in the diagnosis and differentiation of pathogenic and healthy tissue.

### Optical biopsy

When physicians speak of a biopsy, they are referring to tissue samples that are used to provide information about chronic tissue inflammations, tumours, or cancers based on suspected diagnoses. Up to now, biopsies have mainly been performed on an ambulatory basis, depending on the location where the tissue was removed, but some have also been performed on a stationary basis.

Every year, almost 500,000 people in Germany are diagnosed with cancer. As a result of higher life expectancy, the incidence of cancer is also increasing. Most cancers occur in people over the age of 65. Currently, there is an increase of around 2 to 5 percent in new cases each year. The chances of survival depend primarily on the timing and severity of the cancer. Skin cancer, breast cancer and prostate cancer are the most common ones.

If a doctor suspects a form of cancer, a biopsy is usually ordered. According to statistics, out of 20 biopsies performed, the suspicion is confirmed in four. However, performing a biopsy is not only nerve-racking for patients, as the result is not available immediately, but also expensive for health insurers. The treatment costs of cancer diagnosed at an early-stage amount to a manageable sum of a few thousand euros for health insurance companies. Late-detected cancers, on the other hand, can cost several hundred thousand euros.

A new form of biopsy now promises safer, faster, and more cost-effective results. The optical or digital biopsy does not require tissue removal and thus, spares the patient a surgical procedure and waiting time for the examination result. The company VivaScope developed a confocal laser scanning microscope that can scan the area from the top layer of skin to the stratum reticulare. Using high-resolution black-and-white images available in real time, the laser scanning microscope can determine if and what form of skin cancer is present. The non-invasive, painless procedure provides deep insights into the individual cellular microstructures.

The confocal images are generated by using a laser beam. The laser emits waves in the near infrared range both through an intermediate optical system and a beam splitter directly onto the area of skin that appears suspicious. The skin reflects the laser beam, which is returned by the beam



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splitter and hits a special detector. The light source of the laser is on the same focal plane as the irradiated skin area and the aperture of the detector and are therefore confocal to each other. Patients do not need to be injected with a contrast agent for the examination. Cells from a defined layer that is less than 5.0 µm thick add contrast to the images naturally. This is due to the naturally occurring, varying fluctuations in the refractive index of the microstructures of the illuminated tissue.

Will digital biopsy become established? Has the topic piqued your interest? Would you like to gain further insights? We would be happy to bring you in touch with the company. In addition, we have compiled a list of international companies that are researching and developing in the field of optical biopsy. arcoro CONNECT links innovative trends, companies and people - personally and directly.

COMPANY	LOCATION	WEBSITE	FIELD OF EXPERTISE
VivaScope GmbH	Germany	<a href="https://www.vivascope.de/de/">https://www.vivascope.de/de/</a>	optical biopsy
Michelson Diagnostics Ltd	UK	<a href="https://de.vivosight.com/">https://de.vivosight.com/</a>	optical biopsy
Hologic Inc	USA (MA)	<a href="https://www.hologic.de/">https://www.hologic.de/</a>	optical biopsy
Mindpeak GmbH	Germany	<a href="https://www.mindpeak.ai/">https://www.mindpeak.ai/</a>	Tools for optical diagnostics

Would you rather have a direct contact person to exchange information about innovations and trend developments in the field of biopsy? We have researched for you and identified a few interesting experts. Personalities with years of industry experience and outstanding expertise. We invite you to convince yourself:

INDUSTRY EXPERT	JOB POSITION	FIELD OF EXPERTISE
Prof. Bernhard Wilhelm Roth	Managing Director and Scientific Director of the Hanover Center for Optical Technologies (HOT)	Optical technologies
Dr. Titus Brinker	Research group leader at the German Cancer Research Center DKFZ	Dermatology
Prof. Dr. Constantine Gatsonis	Head of the Department of Biostatistics at Brown University	Optical technologies

