

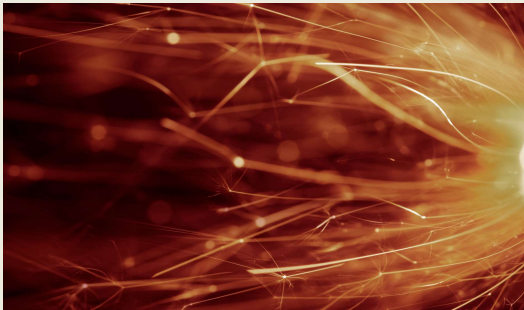
FLUORESCENCE LIFETIME AND OCT IMAGING FOR TUMOR MARGIN IDENTIFICATION

Patrick Kolsch
NKT Photonics

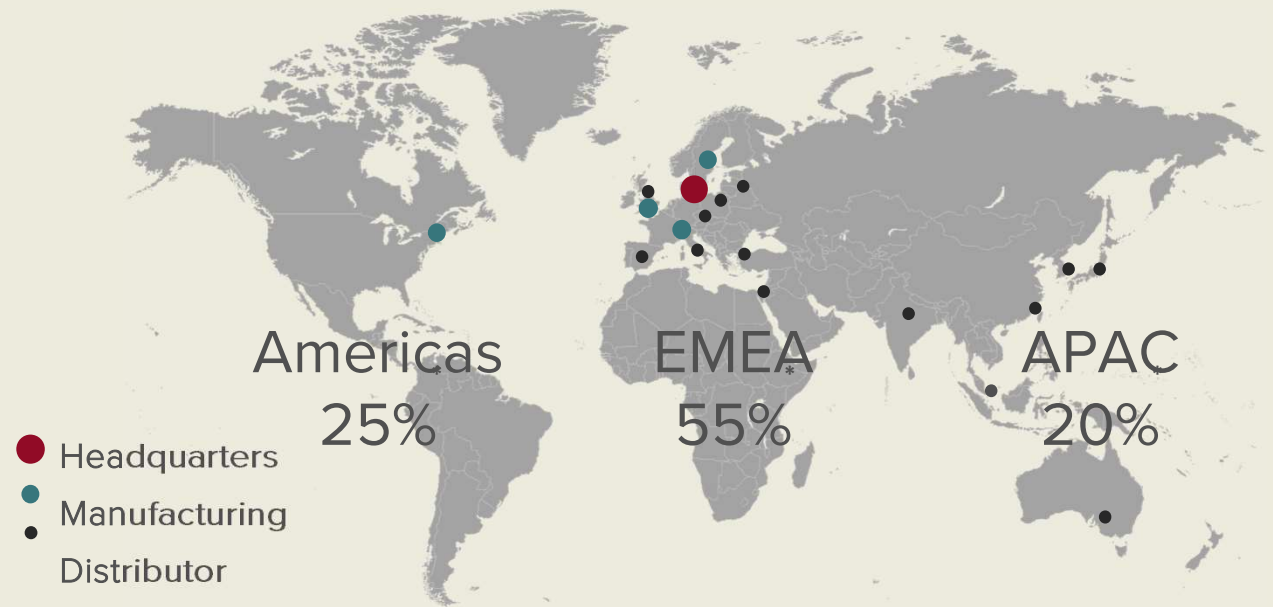


NKT Photonics at a glance

Overview



- Headquarters in Denmark
- ~450 employees



Our focus markets

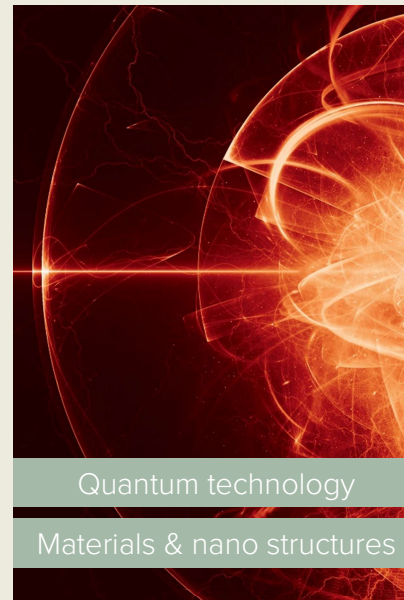
Medical & Life Science



Industrial



Quantum & Nano Tech



Aerospace & Defense



NKT Photonics' core products

SuperK
Supercontinuum white light lasers



Ultra broadband lasers covering visible to near infrared wavelengths.

Replacing lamps, LEDs and lasers

Koheras
Single-frequency fiber lasers



UV, VIS and nIR low noise fiber lasers with industrial form factor and high reliability.

Ultrafast
Femto- & picosecond lasers



Femto- and picosecond pulsed solid-state and fiber laser

Core Photonic Crystal Fiber technology used across all product lines

Our main markets per product line

SuperK
Supercontinuum white light lasers



Bio- & medical imaging

Device characterization

Materials & nano structures

Koheras
Single-frequency lasers



Remote sensing

Quantum technology

Directed energy

Ultrafast
Femto- & picosecond lasers

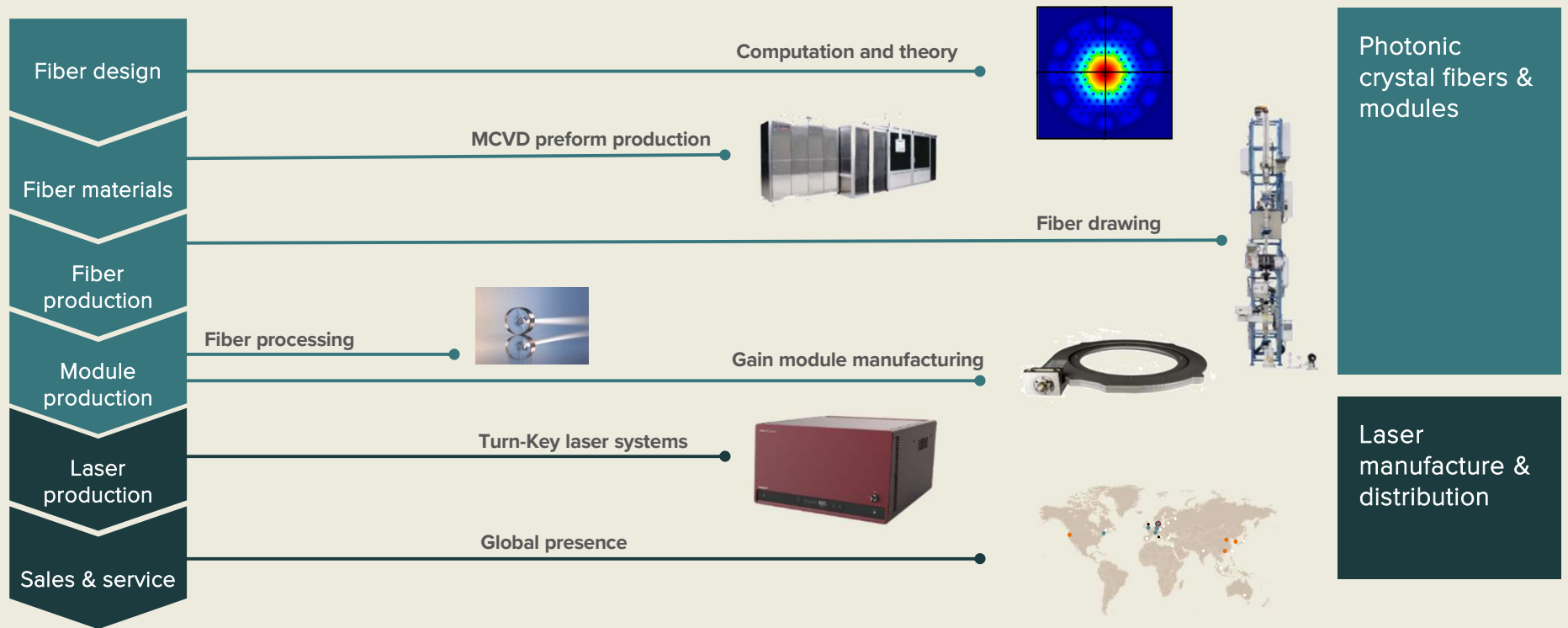


Ophthalmology

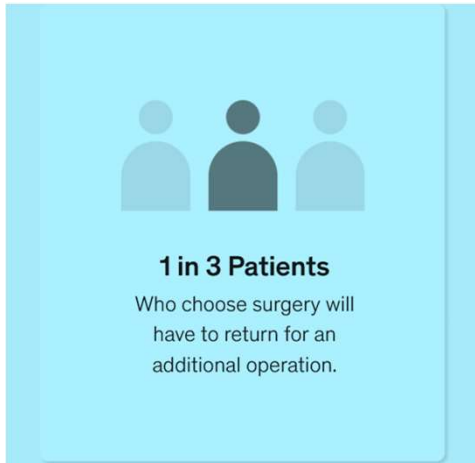
Bio- & medical imaging

Semicon

We are vertically integrated



Breast cancer

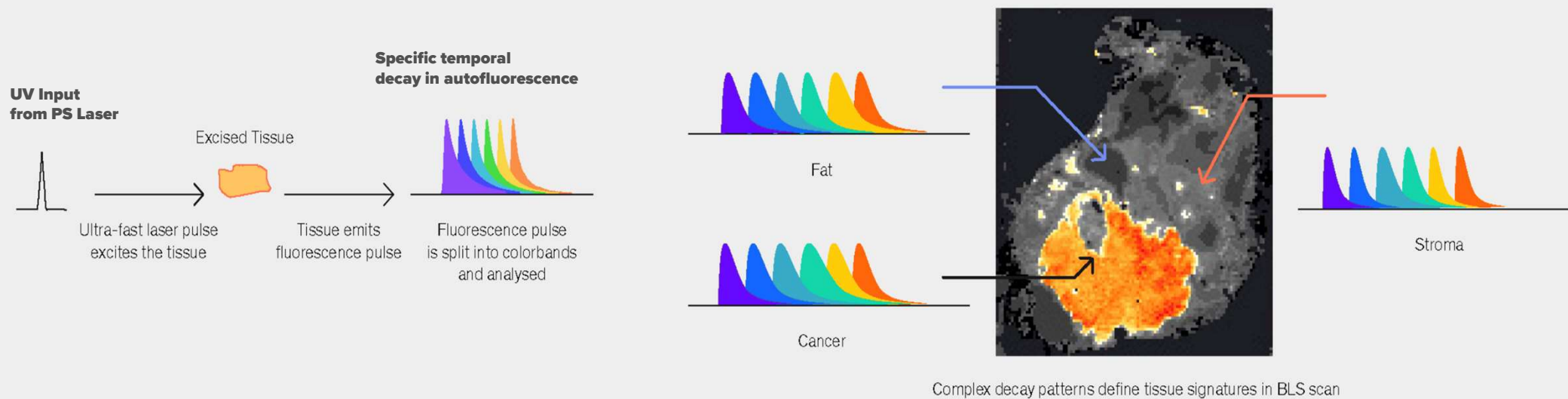


Breast cancer is one of the most common cancers in women today

- One out of eight women being diagnosed with the disease in their lifetime.
- 75% of those being diagnosed with cancer undergo lumpectomy
- 1 in 3 patients who choose surgery will have to return for an additional operation.

New technologies are needed to help surgeons in achieving near-complete tumor excisions.

Time-resolved laser-induced fluorescence



Based on autofluorescence, no dyes or drugs required



BLACKLIGHT
SURGICAL



- Early clinical data showed very high levels of accuracy.
- Received “breakthrough Device Designation” from their preliminary work.
- Highly accurate margin detection in the OR in near real time.

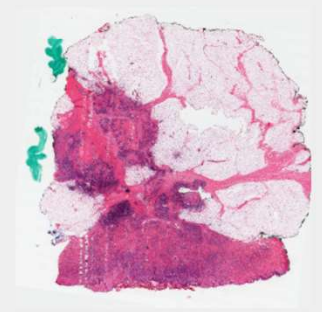
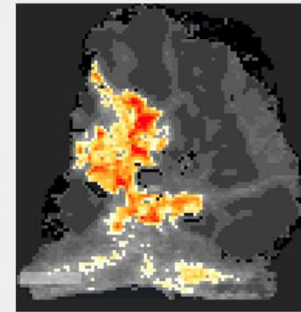
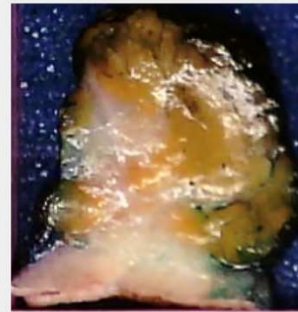
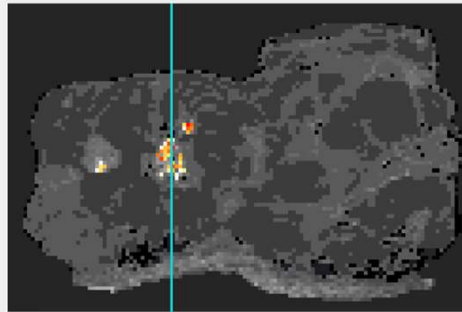
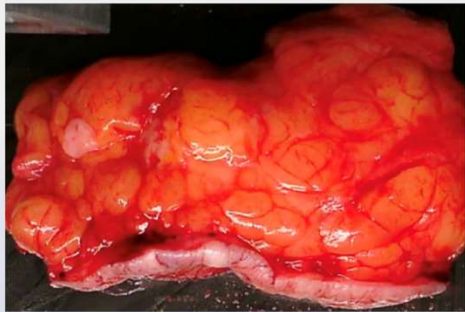
Visible Image

TRF Scan

Visible Image

Scan Image

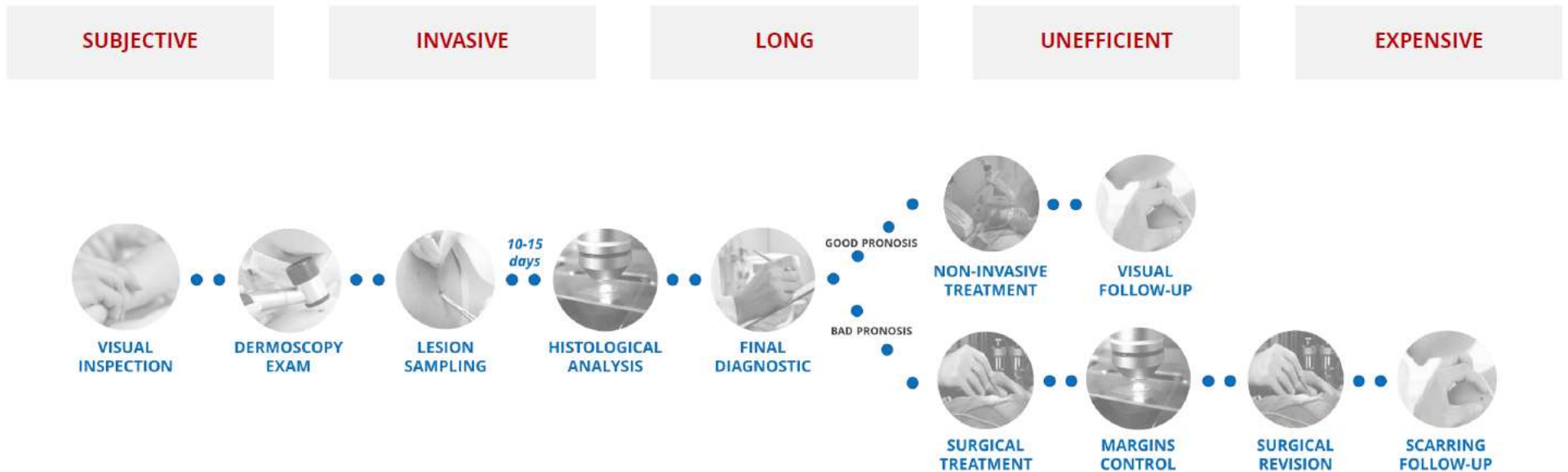
Histopathy Image



A section through the “Hot Spot” on the lump

Skin cancer - conventional patient pathway

Fastest growing cancer in north America, Europe, and Australia



DeepLive - a novel skin cancer management

STANDARDIZED

NON-INVASIVE

IMMEDIATE

PRECISE

COST-SAVING

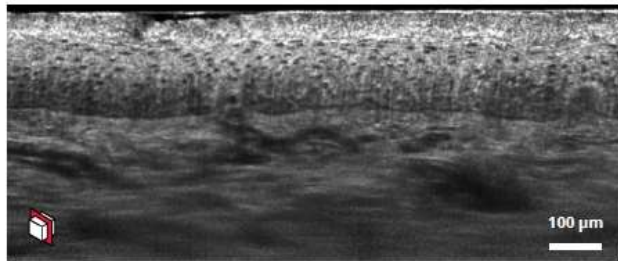


DAMAE MEDICAL

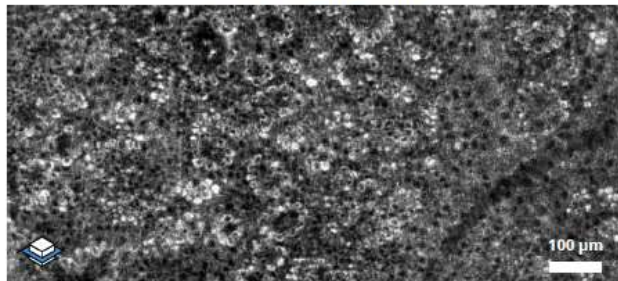
Linefield confocal optical coherence tomography (LC-OCT) with Supercontinuum laser for optical biopsies

- Applied to
- Diagnostics of basal-cell carcinoma
 - Screening of melanoma
 - Presurgical margin delineation

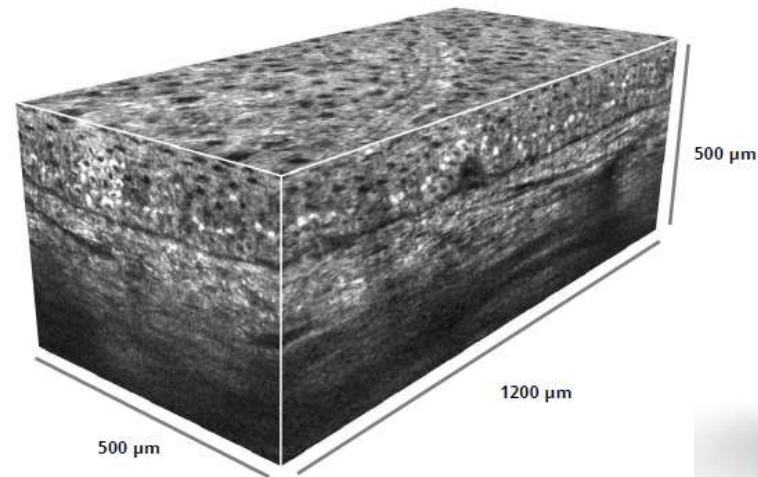
Vertical live mode



Horizontal live mode



3D stack with isotropic cellular resolution



Supercontinuum laser





Summary and discussion

What we can do for you:

- Fiber laser technology enables integration and long-term reliability required for medical applications.
- Complex laser sources are now available in compact form to be integrated into medical carts.
- Examples include fluorescent lifetime or OCT imaging for cancer margin detection.
- Medical expertise and certifications (e.g. ISO 13485).



What you can do for us:

Help us learn what you need:

- What are your laser needs?
- What are your current limitations?

Can include:

- Which wavelengths
- Which pulse durations
- Power levels
- ...



NKT PHOTONICS
Solutions for Innovators