

SUMMER RESEARCH

SUMMARY

Biophotonics Imaging Lab

→ prof. Stephen Boppart

Optical
Coherence
Tomography

→ Also see
Diagnostic
Photonics

→ SPIE.

Medical technique
that uses light
to capture μm -resolution,
3D images from optical
scattering media

Medical Imaging Systems

Medical
Ultrasonography

MRI

Confocal
Microscopy

OCT

Whole body

Low resolution
(fraction of
millimeter)

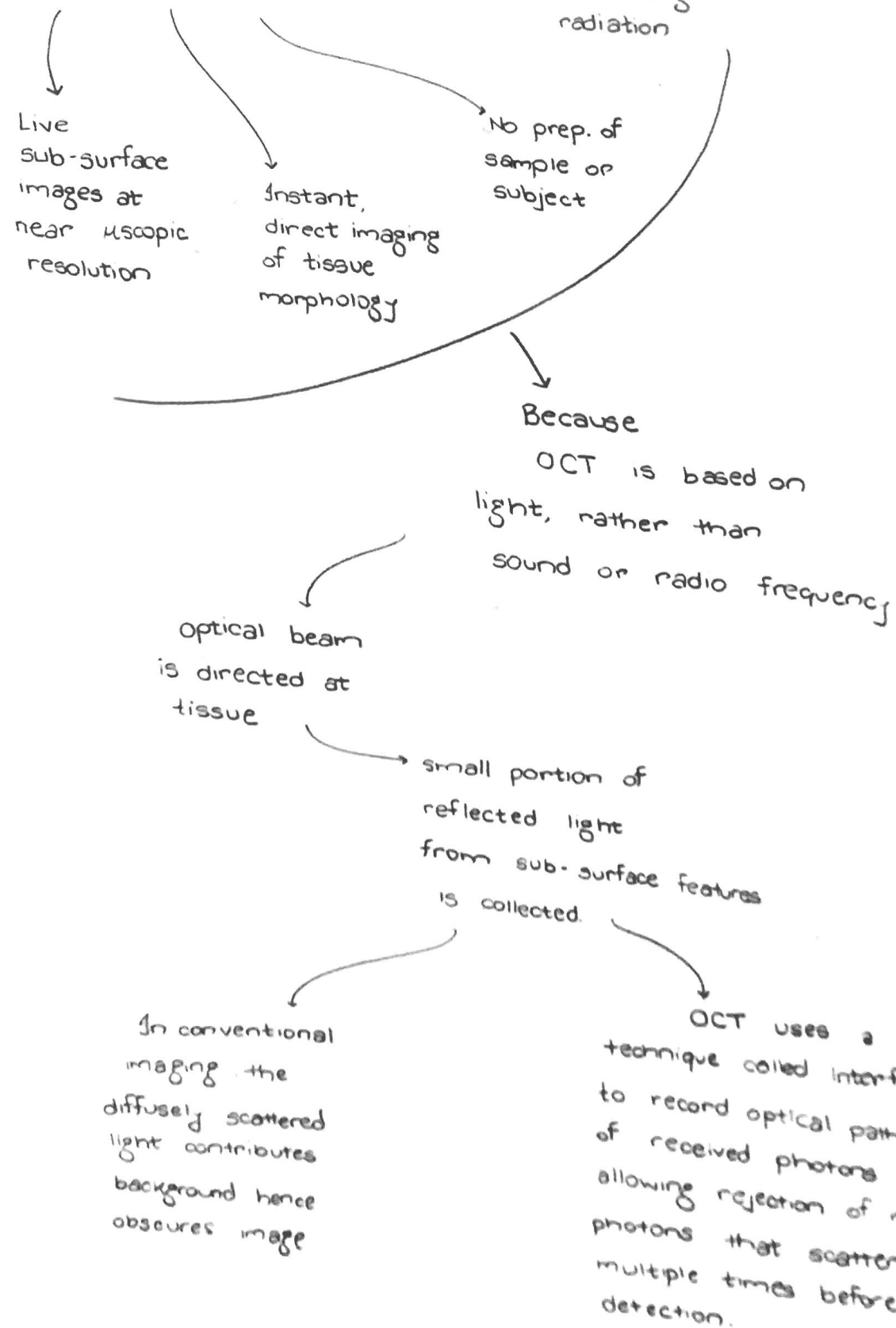
good reso.
(0 to 100
 μm depth)

500 μm
with lower
(architectural)
reso.

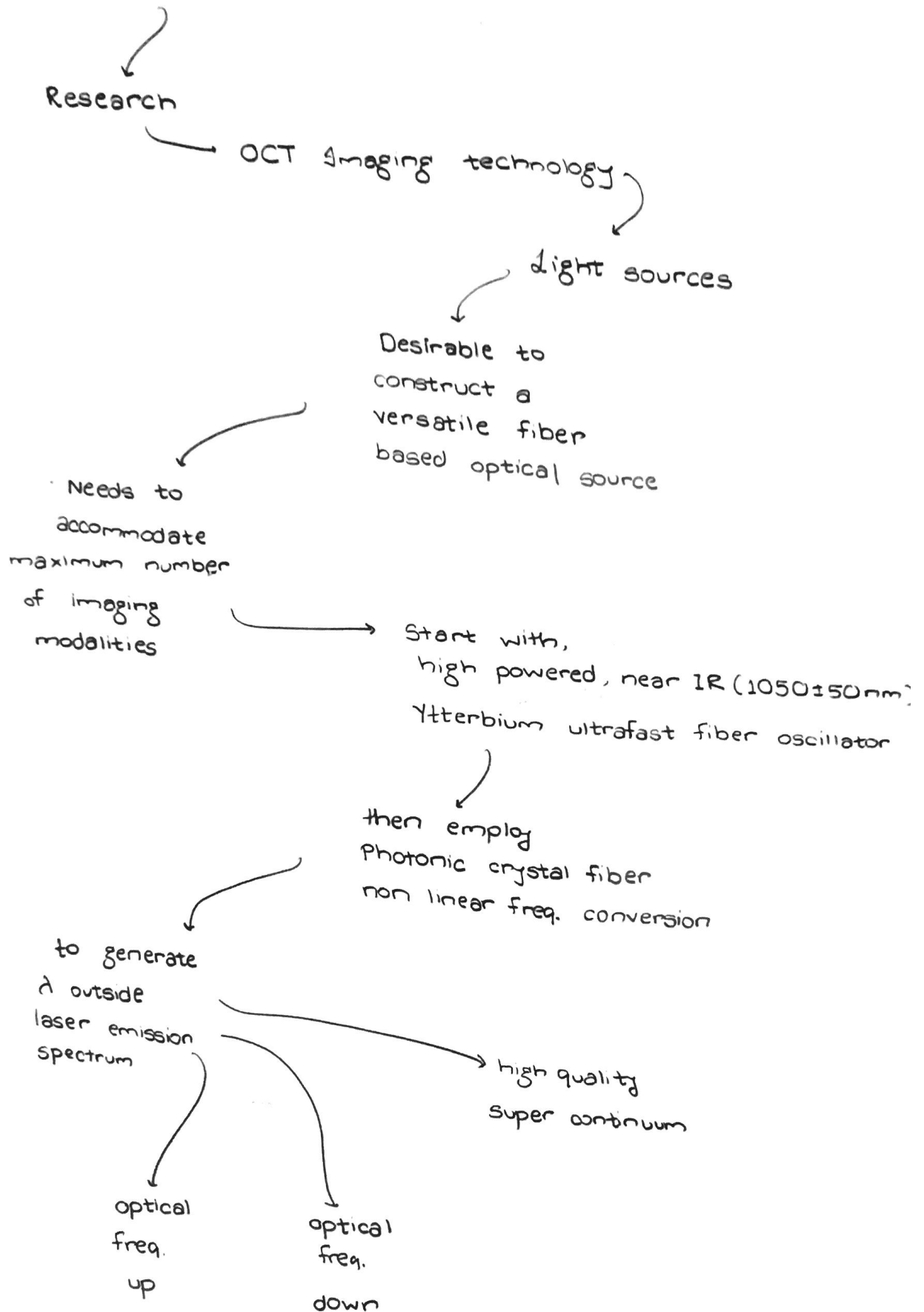
10 μm in lateral
few μm in depth
in ophthalmology

20 μm in
lateral
endoscopy

Benifits of OCT



From the Biophotonics Imaging Lab website



Optical Elastography

↳ OCE

Magnetomotive OCE

Introduce

magnetic nanoparticles (MNPs)

↳ A steel microbead

in the medium to be probed

↳ Apply a small, controlled, external magnetic field

↳ thus, gain access

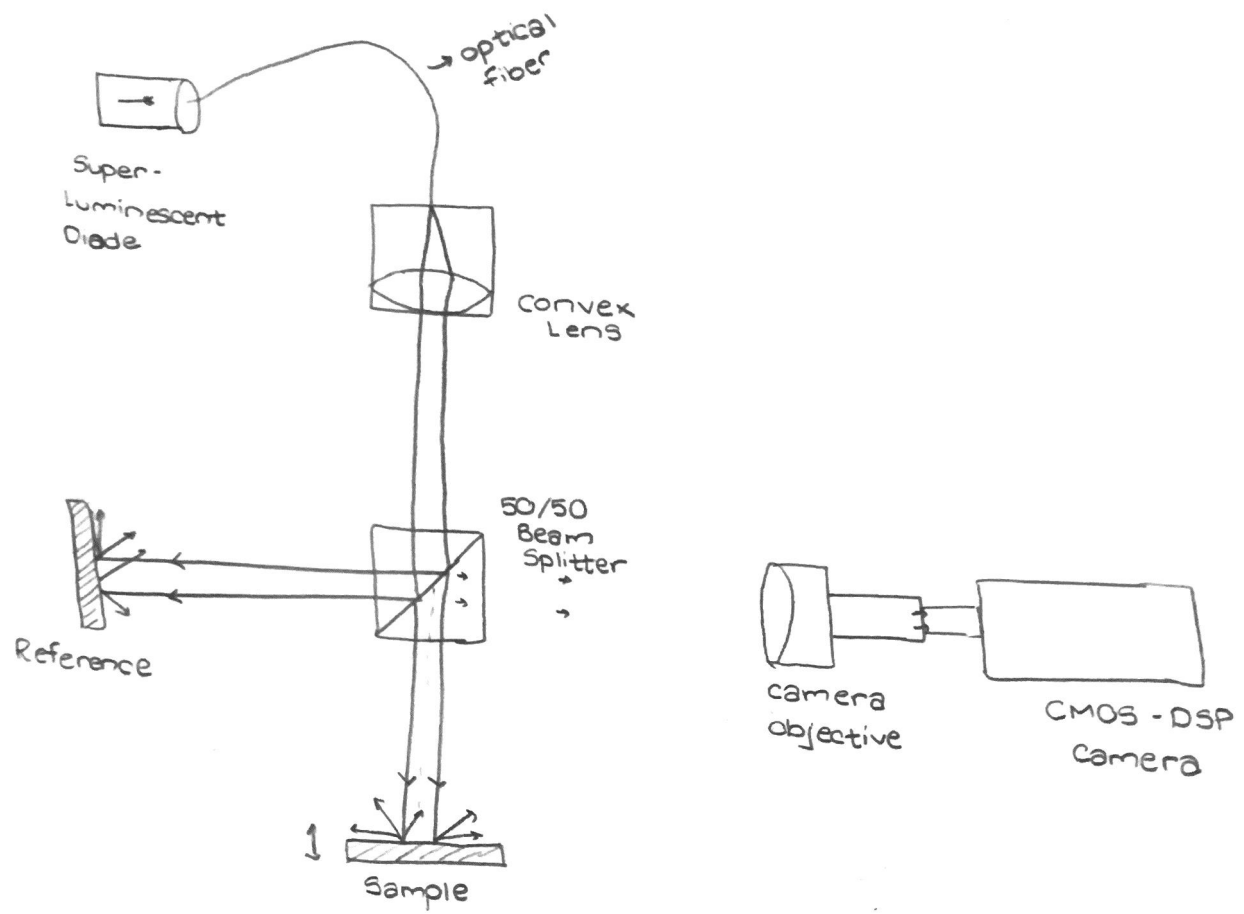
to nano- to micro level interactions betⁿ MNPs and surrounding environmental Matrix

↳ When excited by a step waveform from the electromagnet natural freq of oscillation of each sample was obtained

↳ Result

↳ A linear relationship between natural freq. of oscillation of a material and a square root of its elastic modulus.

Principle of OCT



Full-Field OCT set up

Magnetomotive dynamics of magnetic particles for Optical Imaging Contrast and Elastography

