SONANO

Nanoparticles for
Optoacoustic Imaging

Sponsoring Booklet

ETH zürich

Our Vision

To revolutionise medical diagnostics by putting the power of current US$3.5 million MRI machines into a simple scanner.

Every third person will in their lifetime be diagnosed with cancer. Today, 1.3% of the world's population, roughly 100 million people, has cancer and this number is set to grow in the coming years. In the UK, almost half of all cancer patients are currently being diagnosed too late fating 100'000 cancer patients to die because there is too little capacity to diagnose them all properly. This is unacceptable and highlights why we need optoacoustic imaging in hospitals right now!

A state-of-the-art imaging device like an MRI scanner costs US$3.5 million, requires a specially designed room, trained technicians and sophisticated maintenance, thus putting this vital technology out of range of most hospitals, let alone doctors' cabinets. For example, in West Africa less than 100 MRI scanners serve 400 million people. Radiography, such as Computational Tomography (CT), uses ionizing radiation, increasing the risk of the patient getting cancer as a consequence.

Optoacoustic imaging technologies are comparatively inexpensive, far less risky for patients and combine the user friendliness of ultrasound technology with laser precision imaging.

We want to enable opto-acoustical scanners to provide live, detailed, instantaneous three-dimensional images resulting in shorter wait times, lower costs and a more sustainable method of medical diagnostics. To do this we are developing highly specialised, activatable nanoparticles to target breast cancer.

We believe that the future of medical diagnostics lies in optoacoustic imaging, and we want to bring that future to you!

Our Project

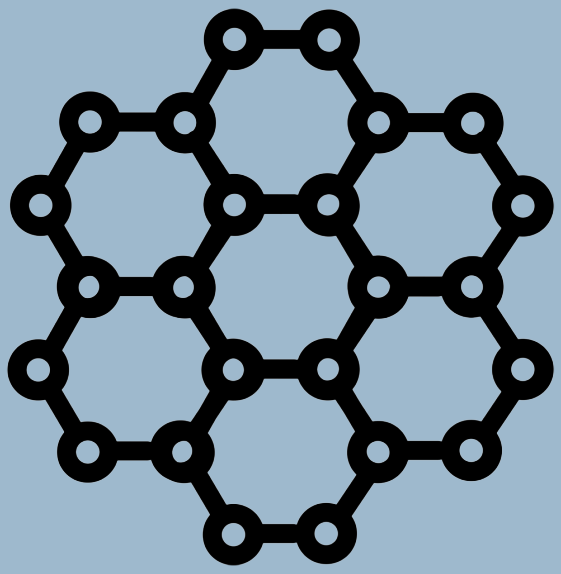
SONANO is a Focus Project at ETH Zurich. We are a team of eight mechanical and electrical engineering students, intent on bringing optoacoustic imaging technologies to the market. We are working together with ETH researchers to develop a system which is more efficient, not harmful and a lot faster than its competition (MRI, CTs and X-rays). By doing so we will be making medical diagnostics more accessible to the world as well as reducing the carbon footprint of biomedical imaging and increasing its sustainability. We aim to create our first patented nanoparticle by the end of May 2023.

Breast Cancer

One in eight women will get breast cancer in her lifetime. Today, breast cancer is detected with mammograms, but each mammogram increases the risk of cancer through ionized radiation, which is why many women are reluctant to test themselves regularly. With optoacoustic imaging, annual screening for breast cancer could be done more effectively and efficiently because it is less expensive, less time consuming and its non-ionizing radiation isn't harmful for the patient allowing more women to be diagnosed early and receive proper and timely treatment.

Optoacoustic Imaging

Optoacoustic imaging is a bio-medical imaging technology that enables high resolution imaging at depths of several centimeters in living tissues. The method combines optical excitation with acoustic detection to enable visualization of rapid biological dynamics and specific tissues.

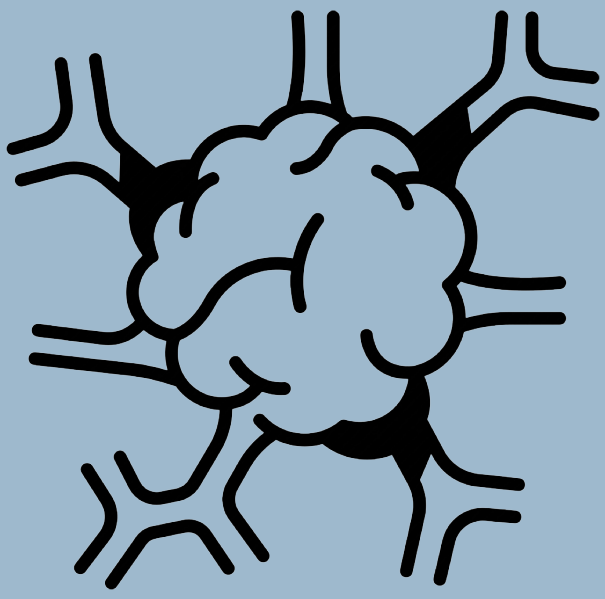


Nanoparticle contrast agents

Nanoparticle contrast agents are substances, which can be used to enhance the visibility of tissues, structures, substances, or pathology when doing optoaccoustical imaging, often by accentuating the differences between two substances.

Nanoparticles and Cancer

Through adding activatible Nanoparticles to the target site, one can enhance the contrast, see the evolution of the cancer cells and even inject a targeted drug into tumours thus guiding us one step further in humanity's quest to cure cancer.



Good Health and Well-being

By pushing the boundaries of a cheaper, more versatile technology in optoacoustic imaging, we are taking the first step towards achieving the UN's SDG 3.8 providing accessible healthcare to all. Optoacoustic imaging can easily be moved around and doesn't require any special room.

Reduced Inequalities

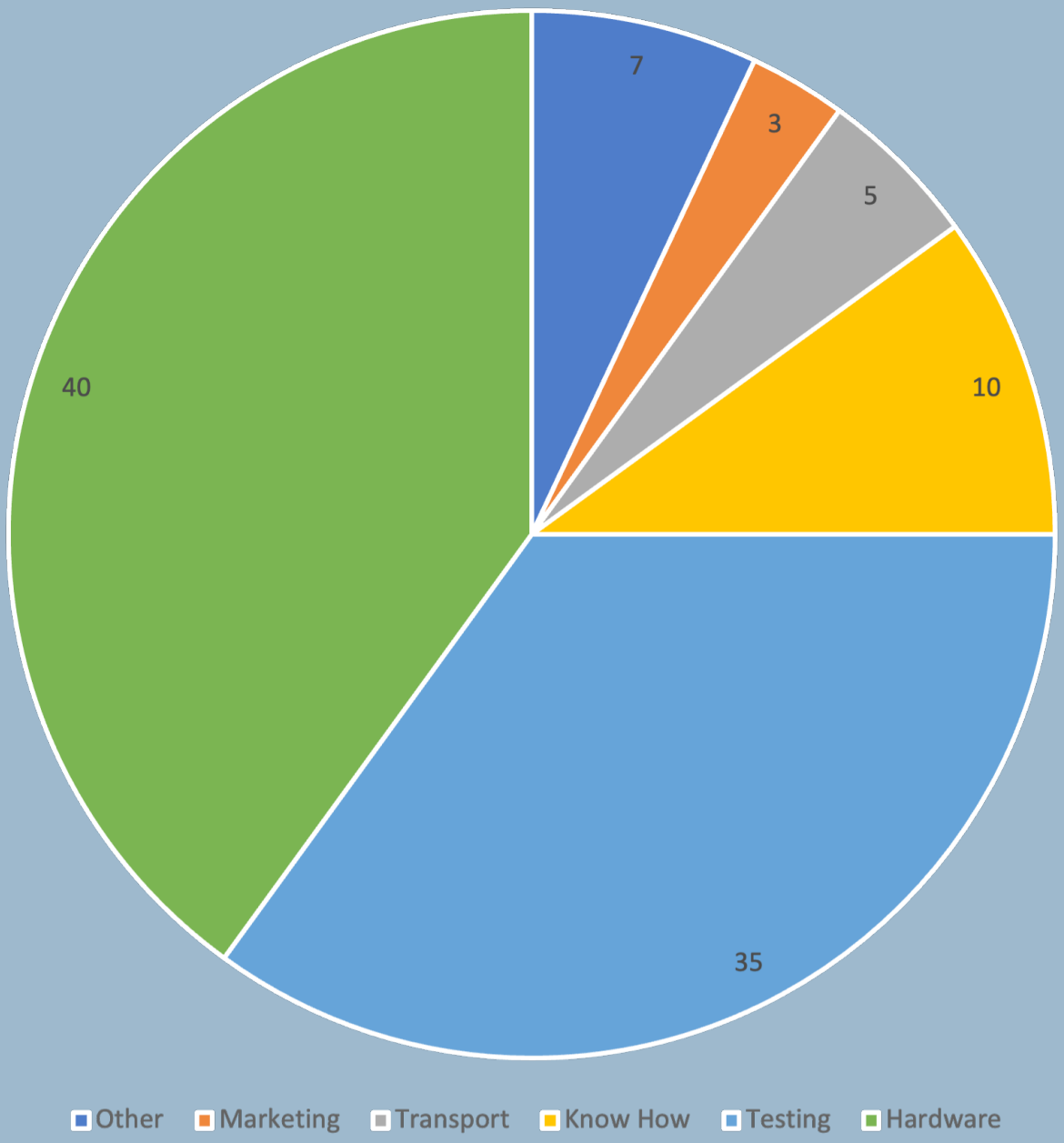
Because of the speed and relative inexpensiveness of optoacoustic imaging, we are reducing the inequalities between developed and developing countries as now the financial burden of appropriate diagnostics is diminished, and equal opportunities are provided.

Climate Action

Optoacoustic imaging consumes a lot less energy than CT scanners or MRI scanners the latter of which must cool its superconducting metals to 4 Kelvin, whilst holding a magnetic field of 1.5 Tesla. This isn't sustainable and can be solved by shifting patients towards optoacoustic scans.

Budget

Our project requires cutting edge lab equipment and a complex testing environment. We thus rely on the extensive support of our sponsors. We currently estimate costs around 50‘000 CHF.



Budget

Hardware: To facilitate our reasearch we require state of the art equipment such as a powerful pulse laser and precise ultrasound detectors.

Testing: In vitro tests are essential for us to analyse the performance of our nanoparticles.

Know How: Optoacoustic Imaging is a novel technology, therefore we require the support of experts in the medical field.

Transport: Since we are collaborating with industry partners we will have travel expenses

Marketing: For a professional appearance at important events as well as on social media, it is essential to have marketing apparel.

Sponsoring

	Bronze from 1‘000 CHF	**Silver** from 2‘500 CHF	**Gold** from 5‘000 CHF	**Diamond** from 10‘000 CHF
Logo on Website	✓	✓	✓	✓
Special invitation to rollout	✓	✓	✓	✓
Logo on banner at presentaion		✓	✓	✓
Logo on Shirt		✓	✓	✓
Social Media Post			✓	✓
Company description on website				✓
Exhibtion Promotion				✓
Job Posting on Website				✓

Sponsoring

Focus projects at ETH are highly prestigious and coveted in the engineering departement. They are the reason why many students decide to study at ETH. The projects are followed with great curiosity by students and researchers alike, the rollout at the end of May is one of the most attended events of the ETH calendar. Focus projects push the boundaries of technology and dare to try something new making them the perfect platform for companies to collaborate with the ETH, to advertise themselves as innovators and to showcase novel products.

Through our social media presence and regular posts, we keep our followers up to date on our most significant developments as well as the contributions of our partners and sponsors.

We also gladly accept non-monetary sponsoring, such as technical components or know how necessary for nanoparticle production or our optoacoustic imaging setup.

If you or your company wishes to find an individual solution or has any questions, contact us. We are looking forward to working together!

Team SONANO

Jérome Bonvin

Marcus Bammel

Sebastian Kravecz

Isabel Klessascheck

Nicola Irmiger

Michael Schmotzer

Tsering Chokchampa

Marc Bischof

Support

Prof. Dr. Inge Herrmann

Prof. Dr. Daniel Razansky

Alexander Jessering

Dr. Xose Luis Dean Ben

Contact

Contact Sponsoring
Marcus Bammel
Phone: +41 78 727 30 30
Mail: sonano@ethz.ch

www.sonano.ethz.ch

sonano_ethz

SONANO-ETHZ

Partners

D MAVT

ETH zürich