

Thyra Imaging, the non-invasive neuroinflammation imaging platform



From stars to single cells, astronomy-grade imaging of the immune cells that affect neurodegeneration.

Thyra Imaging FlexCo, Vienna · Spin-off of the Medical University of Vienna · August 2026

THE CORE

Neuroinflammation is the silent driver of neurodegenerative diseases, like Alzheimer's. Today's tools to detect neuroinflammation burden patients with a spinal tap or require waiting times of up to a year for a radioactive PET scan. Additionally, blood markers for neuroinflammation are either confounded, not specific or not sensitive enough. Thyra Imaging makes neuroinflammation visible in a two-second eye scan. The retina, at the back of the eye, is part of the central nervous system (CNS) and the only CNS-part a camera can reach. Using adaptive optics, the technology invented to unblur galaxies in astronomy, we are the first to image neuroinflammation non-invasively. This is possible by imaging human microglia, the immune cells of the brain, retina and spinal cord, with next-generation resolution.

Today: A working TRL 5-6 prototype is already imaging patients at the Medical University of Vienna, and the technology has been successfully used to image more than 100 subjects and patients.

Tomorrow: Thyra Imaging aims to commercialize the technology and generate first revenue in 2027 from research-use sales followed by certification and implementation into primary care in 5 years.

THE PROBLEM we tackle through non-invasive neuroinflammation detection	
Found too late	Alzheimer's dementia takes on average 3.5 years to diagnose after the first symptoms. The cellular damage has been building up for years by then.
Spinal tap	The reference measure for neuroinflammation needs a needle into the spine. Painful, a known driver of dropout in trials, ruled out for many elderly patients.
PET scan	Radioactive tracer, specialist facility, expensive, long waits. Accessibility and cost are known problems with no solution at hand, which leads to late diagnosis.
Blood markers	Minimally invasive, but not specific to the CNS. The signal is confounded by cells elsewhere in the body and is unreliable in non-symptomatic patients.
The consequence	<ul style="list-style-type: none">Early neuroinflammation detection, before symptoms, is impossible today. Patients are treated too late, when the damage has already been done.192 active Alzheimer's trials run without an early, repeatable readout of neuroinflammation, the process now understood to drive progression. This leads to patient drop-out, trial recruitment issues and increased costs.

THE EVIDENCE TODAY

Ratio of activated immune cells in healthy eyes vs diabetic retinopathy (a neurodegenerative disease)

Immune cells in a living human retina.
Blue, resting.
Orange, activated.

16%

Healthy

51%

Diseased

n=6 healthy, n=11 diseased, p<0.001. Founding study accepted for the Journal of Neuroinflammation.

TRL 5-6	A fully functional laboratory prototype at the Medical University of Vienna is imaging patients today.
World first	First non-invasive imaging of microglia activation state in living human patients with neurodegenerative disease. Microglia cells are the immune cells of the retina, brain and spinal cord, and their activation state or cell shape is an indicator of neuroinflammation (first in-vivo human data ever).
Signed intent	Three letters of intent from research and trial centers in Germany, Singapore and Canada (more incoming).
Clinical authority	The President of the Austrian Alzheimer Society joined as key opinion leader. Together with our co-founder Andreas, an ophthalmologist, this will enable us to translate our technology faster from the eye to brain health.
Grants and awards	€300,000 in non-dilutive funding secured. Inventors of the Year 2025, Medical University of Vienna.
Ongoing patient imaging	Moderate to late Alzheimer's patients are being imaged within an exploratory study together with our KOL, with the aim of moving on to early Alzheimer's patients and to non-symptomatic but amyloid-positive patients.

THE PATH

Ophthalmology pays for the road into neurology. Each stage has a defined milestone and its own funding.

Phase 1 · 2026 to 2027 BRIDGE, THIS ROUND <p>Scale the laboratory prototype into a compact device and build an automated image-processing algorithm. First sale in 2027 as research-use only, where no certification is required.</p> <p>Milestone: first revenue, without waiting for a regulator.</p>	Phase 2 · 2027 to 2030 SEED, EUR 2M (2027) · EUR 2M (2028) <p>Device certification, aiming for FDA 510(k) then CE mark, in 2029. Certification of the automated image-processing algorithm in 2030. Neurology research sales expected from 2028.</p> <p>Milestone: a certified device with a certified image-processing algorithm enabling automatic microglia annotation.</p>	Phase 3 · 2031 onward SELF-FUNDED <p>Entry into primary care from 2031. A large Alzheimer's study, designed to certify retinal neuroinflammation as a biomarker for early diagnosis, is planned to start in 2033.</p> <p>Milestone: first revenue from primary care and neuroinflammation as an accepted early-detection biomarker.</p>
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THE MARKET	
Market 1, from 2027	Research use, no clearance needed. Sell to ophthalmology and neurology. >50 ophthalmology sites are near-term customers and there are >6,000 Alzheimer's trial sites worldwide, roughly 5,000 in high-income markets. Buyers are pharma, biotech and research centres. Goal: more than 50 devices by 2031, enabling > €15M in revenue, followed by broader market adoption.
Market 2, from 2031	Primary care, once certified. 3.4 billion adults aged 45+ worldwide, \$25 million in high-income markets. Business model to be based on device sales and recurring per-scan revenue on top.
Unit economics	Initial units are to be sold at 30% gross margin to early adopters, with more than 60% targeted in the mid to long term. The first 10 units will be built in-house followed by contracting of external parties for manufacturing.
The plan	€0.2M revenue in 2027 rising exponentially afterwards. Profitable from 2030 and self-funding from 2031, €4.5M of equity plus €2.25M non-dilutive grants.

WHY THIS FITS A FAMILY OFFICE OR ANGEL

Frontier deep tech with a human outcome: The same scan that shows a drug developer whether a therapy works will one day tell a 55-year-old whether the cellular process of dementia has started, or whether an Alzheimer's treatment is working, before any symptoms appear.

Capital-efficient by design: Profitable in 2030 on €4.5M of investment plus €2.25M of grants, with no later round required. Venture capital would accelerate this plan, not enable it.

Early revenue and exit potential: Certification is planned in waves in the coming years, but the research-use market opens in 2027, so first revenue does not wait for a regulator. Existing players are trying to access neurology, but struggle. Our technology provides a potential entry for them.

An ever-expanding platform: Microglia cells are the start, not the finish line. The same system can resolve a multitude of cells and microstructures, enabling advances in ophthalmology long-term.

THE TECHNOLOGY

From astronomy	The atmosphere blurs the stars, the eye blurs its own retina. Adaptive optics corrects both. Our CEO worked on these optics for European Southern Observatory telescopes before turning them on the eye.
Immune cell shape as biomarker	Microglia immune cells, part of the retina and the brain, are known to change their shape (state), indicating neuroinflammation. We can image these states in the retina non-invasively. This allows a direct view onto neuroinflammation.
What nobody else has	The only retinal imaging system built on a pyramid wavefront sensor. Unlike others, we retain image quality in elderly eyes, including those with cataracts and artificial lenses, while still resolving single cells.
What the patient feels	Two seconds. No needle, no radiation, no contrast agent. Only 15 minutes of preparation, followed by a quick scan, and it is done.
Designed to scale	Standard, off-the-shelf optics rather than tailored parts, which will hold production cost and supply-chain risk down as volume grows.

A galaxy through the atmosphere, with and without adaptive optics. The same innovation, applied to the eye, resolves single immune cells.

THE TEAM and IP	
Three co-founders, one decade	Elisabeth Brunner (CEO, adaptive optics), Michael Pircher (CSO, 25 years in biomedical optics, more than 150 papers) and Andreas Pollreis (CMO, ophthalmologist, heads a diabetic eye clinic). They had worked together for nearly 10 years before founding Thyra Imaging.
Know-how and IP	The technology was built from scratch by the co-founders over several years at the university, both hardware and software. Key aspects were deliberately not published and additional IP is being generated.
No key-person cliff	The CEO led the adaptive optics development of the device herself and was its sole operator through a two-year clinical study.
Gaps already closed	Business development, machine learning, neurology access and regulatory affairs each have a named owner.

THE ASK

> €500,000

SAFE · €5M cap · 20% discount

Bridge towards first revenue and the Seed round.

This round funds

- Device scale-down, to enable the first sale in 2027 (3 LOIs in place, more incoming)
- Development of the automated image-processing algorithm
- Equity co-financing that unlocks further non-dilutive grants (applications ongoing)

Already secured: €300,000, non-dilutive. Founders hold 100% on three-year reverse vesting, with a 20% virtual employee pool established. The data transfer agreement with the Medical University of Vienna is in place, and the terms of the IP license agreement are being negotiated.

Anchor Tech Investor is on board

WHAT HAS TO GO RIGHT	Device scale-down lands on schedule · the certification timeline holds · enough expert-annotated data to train the algorithm · the retina-to-brain link for neuroinflammation in neurodegenerative diseases such as Alzheimer's, already established through histology of human retinas, is confirmed in vivo by our technology
HOW WE DE-RISK	Partnership with a medical device manufacturer is being established to aid device scale-down · the data transfer agreement with the university is finalized, enabling access to past and future images for annotation · our own Alzheimer's clinical study, starting in 2033, is designed to prove our technology as a tool for detecting early Alzheimer's