



**Senfina
Biosystems**

We use **robotic imaging and analysis**
to **accelerate drug screening**
to help **aging researchers**

***discover effective
new medicines***

An opportunity from

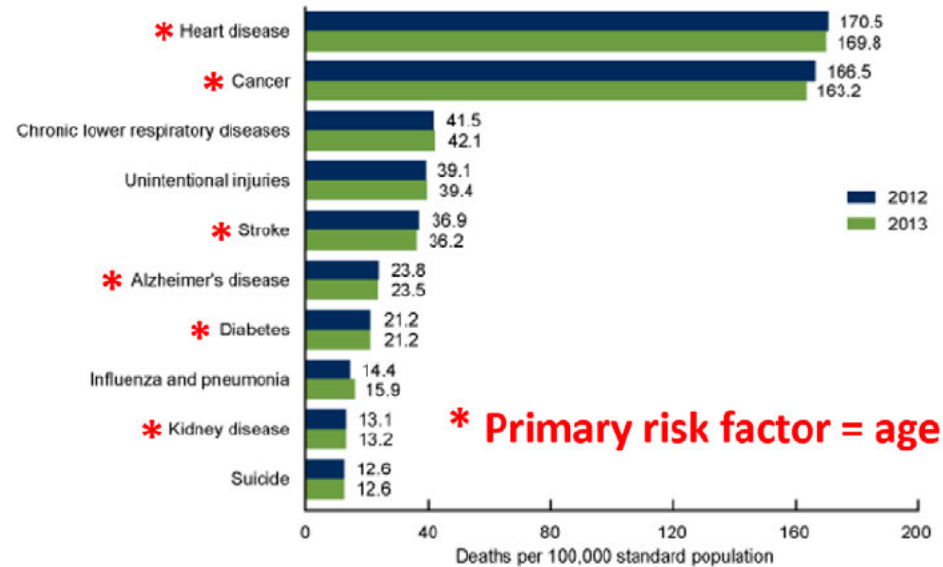


THE UNIVERSITY OF ARIZONA
**TECH LAUNCH
ARIZONA**

Drug and drug target discovery in Aging

Top diseases share age as primary risk factor

Age-adjusted death rates for the 10 leading causes of death (USA).



CDC NCHS Data Brief
(#178)

Current solutions are insufficient

- Age-associated diseases are the leading causes of death in the US and worldwide
- Discovery of drugs targeting aging using mammals is slow (2 to 10+ years) and expensive (\$200K+ per study)
- Direct high-throughput screening for interventions that increase lifespan in mammals is impractical

➔ "Fail-fast" approaches are needed to rapidly focus resources on candidate drugs with high clinical potential

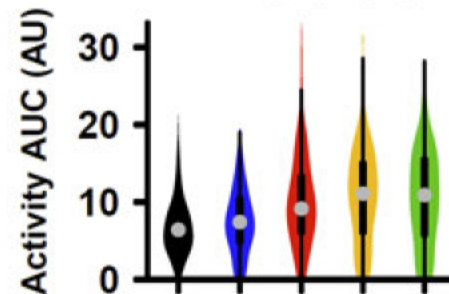
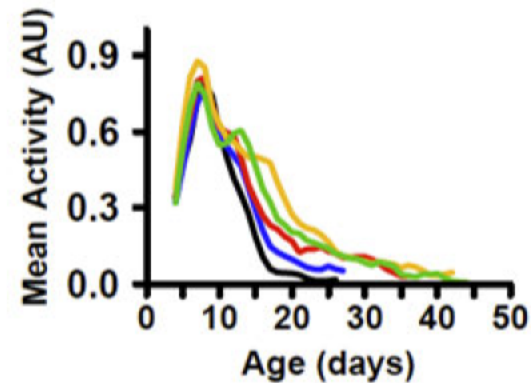
Nemadex Part I: *C. elegans* as a Whole-life Model

The *C. elegans* advantage

- Rapid turn around of life-time investigations (3-week lifespan)
- Inexpensive and scalable (~\$250 per experiment), in experiment population analysis
- Proven translation to mammals due to significant gene homology in essential genome

Measured Physiologies

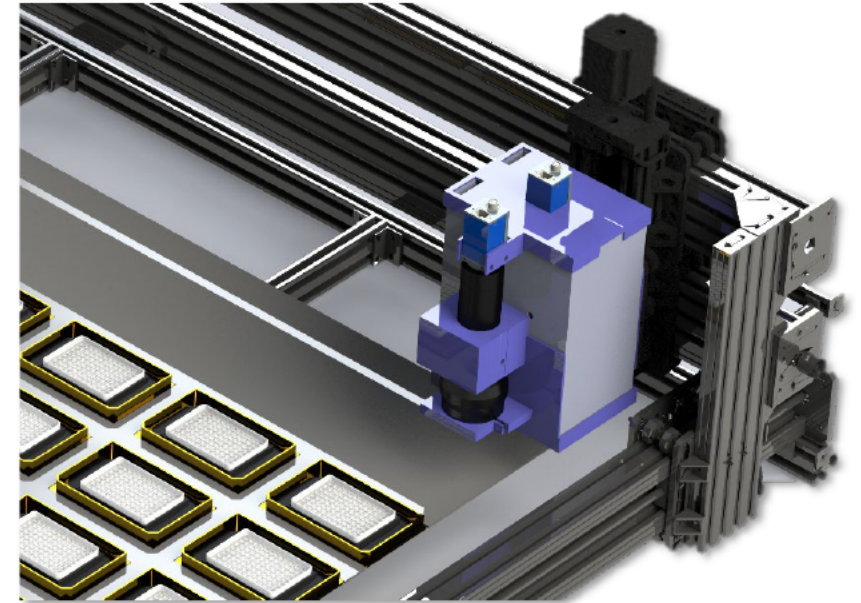
- Longevity: Impact of agents on life-span
- Healthspan: Impact of agents on aging morphology and degeneration through daily activity and response to perturbation
- Body size and shape: Tissue degeneration and identification of degenerating cell types



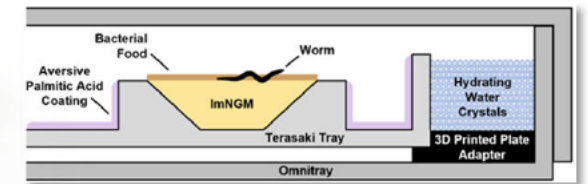
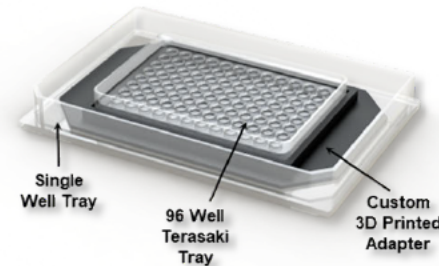
Nemadex Part II: Robotic High-content Imaging

The Nemadex Advantage

- Automated, unbiased data collection
 - 20,000+ animals in parallel
 - Many traits measured
 - Traits measured over the course of the entire lifespan of each animal
- High-content analysis
 - Machine-learning automated feature detection
 - AI-driven phenotypic and biomarker based pathology
 - Individual nematode monitoring



Nemadex Robotic Imaging Platform



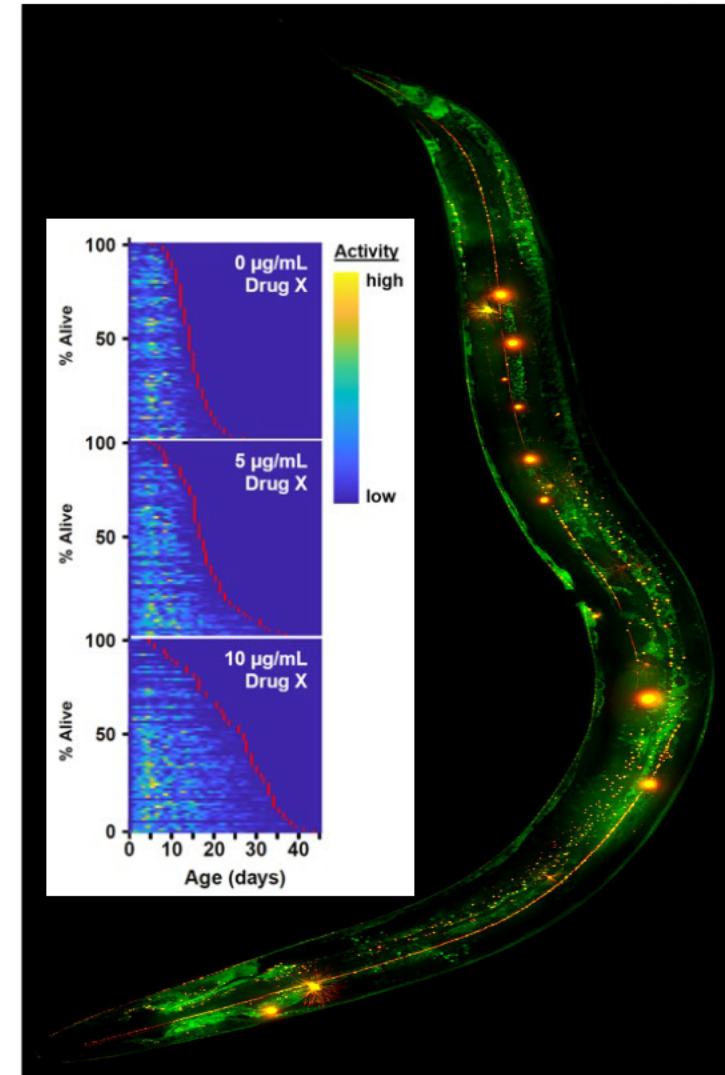
Nemadex Part III: Drug and Genetic Screening

Biomarker Driven Deconvolution of Molecular Processes

- Dedicated fluorescent molecular reporters with multiplexes wavelength measure
- Customizable to each purpose, multiple pathways can be monitored in each experiment
- Thousands of biomarkers are available, proprietary markers can be generated or adopted from clients

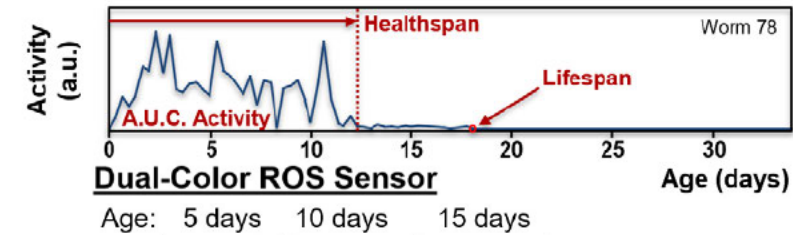
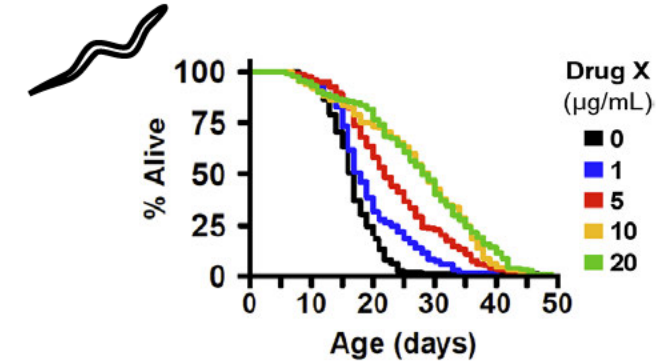
Drug Testing

- Whole body response to insults
- Long-term drug combination testing to monitor development and degeneration
- Monitoring of xenobiotic whole-body distribution

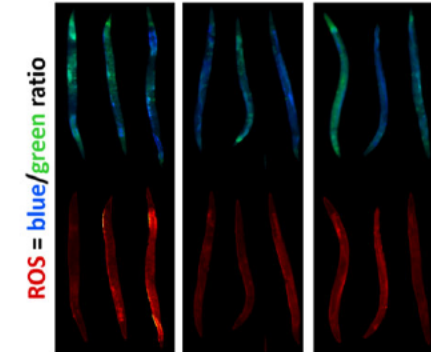


Nemadex versus the competition

		Approach				
		<i>in vitro</i>	Cell-based	Mouse-based	Other <i>C. elegans</i> Platforms	Nemadex
Relevance	<i>In vivo</i> ?		✓	✓	✓	✓
	Whole animal?			✓	✓	✓
Animal	Longevity?			✓	✓	✓
	Healthspan?			✓	some	✓
	Physiology	Activity?			✓	some
Body size/shape?				✓	some	✓
Molecular	Single-channel	✓	✓	✓	some	✓
Activity	Multi-channel	✓	✓	✓		✓
Efficiency	Low cost?	✓	✓		✓	✓
	Rapid?	✓	✓		✓	✓
	High throughput?	✓	✓		some	✓
	High content?	✓	✓			✓



Age: 5 days 10 days 15 days



Control Gene A Gene B
Control Gene A Gene B
Control Gene A Gene B

Business model

Contract service model (phase I):

- Fee-for-service
- High-content drug and drug target screening
- Provide experimental design support, analysis, and new worm model development
- Target customers: pharmaceuticals, nutraceuticals, startups/CROs, academics

Early-stage drug development (phase II):

- Capture IP (new or repositioned drugs)
- Funding – grants, industry/academic partnerships, venture investment, loans
- Discovery process – AI driven candidate selection, internal screening on Nemadex (worms), validation in cells/mice
- License, partner, or expand for clinical testing

Recent industry deals

Recent Deals (since 2020)*

- Ora Biomedical (Seattle, WA) – \$0.40 M raised (seed)
- Magnitude Biosystems (Sedgefield, UK) – \$1.26 M raised (grant, seed)
- NemaLife (Lubbock, TX) – \$4.74 M raised (grants, seed, series A)
- InVivo Biosystems (Eugene, OR) – \$3.47 M raised (grants, series B)
- Vivoverse (Austin, TX) – \$4.33 M raised (grants)
- SunyBiotech (Fuzhou, China) – details undisclosed
- Rejuvenate Biomed (Diepenbeek, Belgium) – details undisclosed

Progress to date

Nemadex v3.0 prototype is operational!

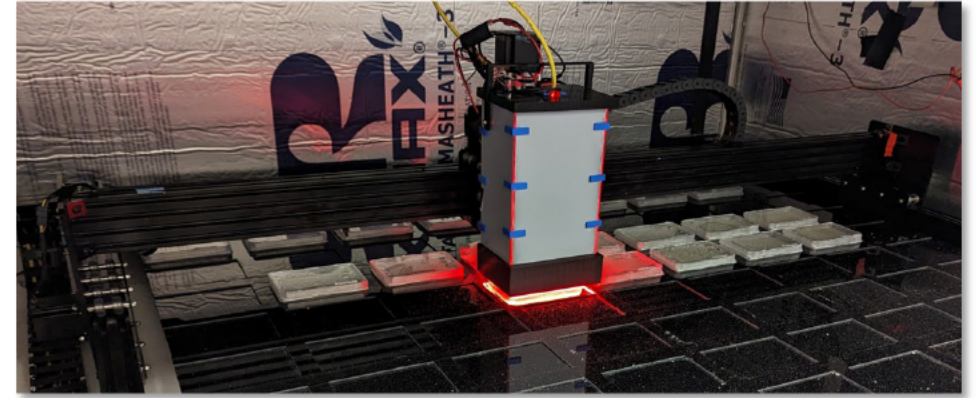
- Automated longevity, healthspan, activity operating for ~3 years
- Fluorescence imaging module incorporated

Validation

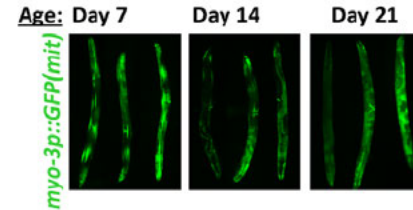
- Physiology measurements fully validated
- Fluorescence validation in progress

Funding

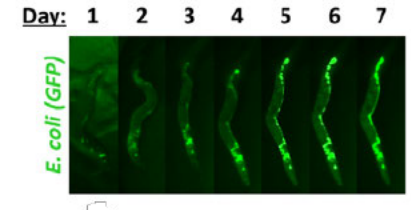
- Asset Development Award (\$70 K, 2023)
- STTR (\$295 K, resubmission 4/2024)
 - Impact score just above payline; comments addressable
- NSF DBI award (\$1.3 M, 10/2023-9/2026)
 - External technical validation, strain generation



Mitochondrial Content



Bacteria Infection Progression



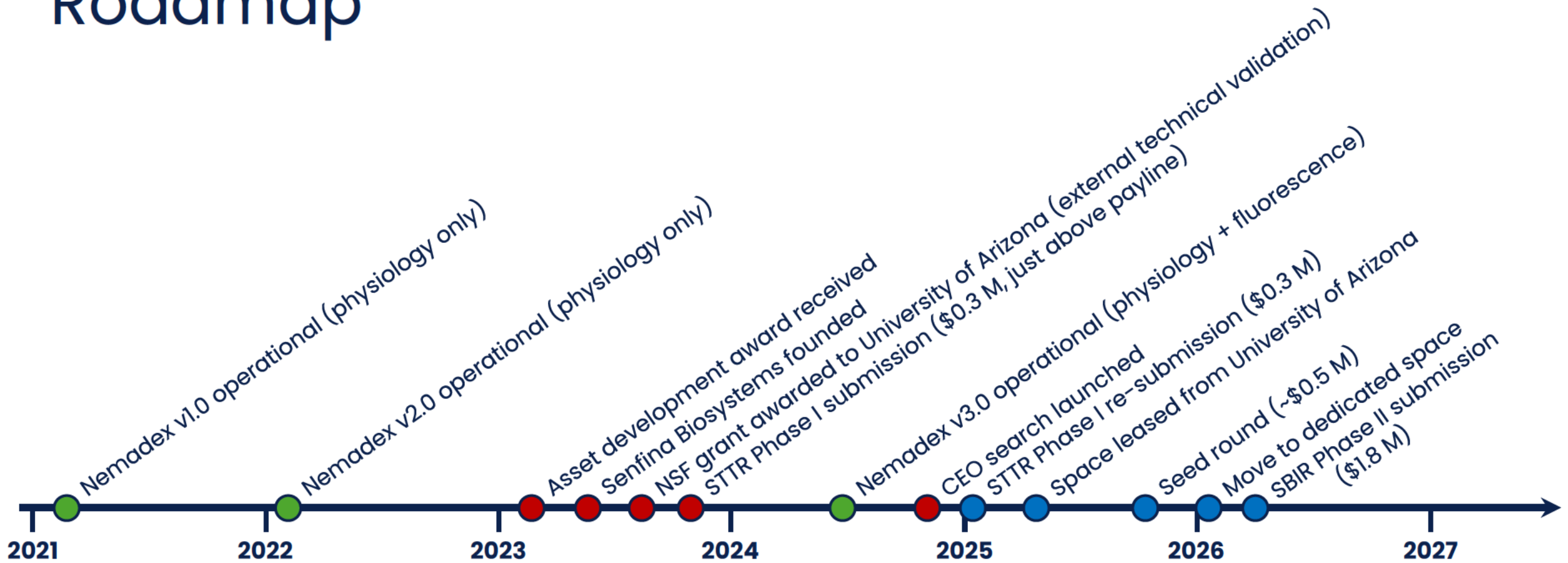
afar

american federation
for aging research

Grant for Junior Faculty



Roadmap



Join us!



George Sutphin
Scientific Lead
Co-Founder



Samuel Freitas
Engineering Lead
Co-Founder



Emily Turner
Operations Lead
Co-Founder



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Business Lead
Co-Founder