



PhageStack

ML for precision Antimicrobials



Meet the Founders

Dr. Ewald Fernbach

Co-Founder and CEO



Bio:

Scientist by training, loves nature and strenuous hiking.

Key Expertise:

- Led teams in process development and production.
- Key role in growing a biotech startup
- Specializes in Databases and biochemistry

Dr. Jonas Fernbach

Co-Founder and CSO



Bio:

Passionate about science, loves art and computer games

Key Expertise:

- academic project leader at ETH and University of Copenhagen
- Bioinformatics and Big Data Expert
- Specializes in synthetic biology

Robert Faber

Co-Founder and COO



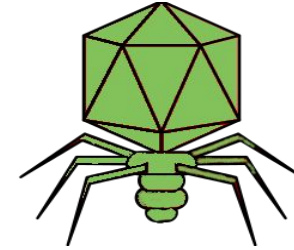
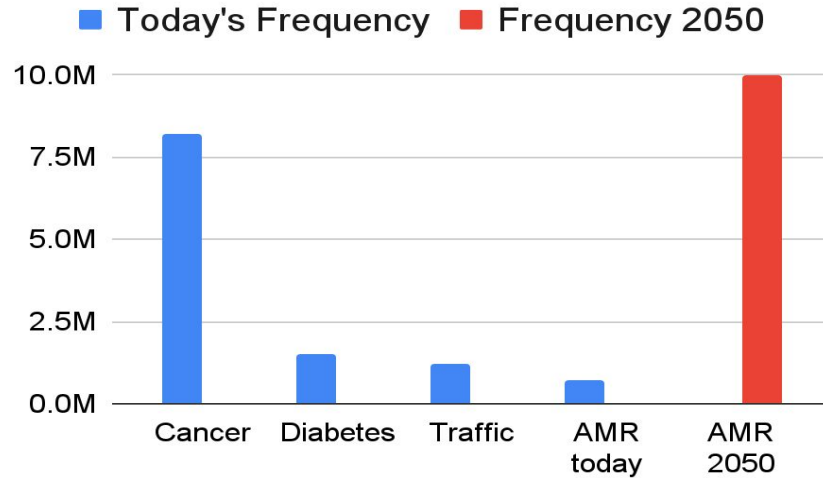
Bio:

Experienced manager dedicated to leadership, with a passion for nature and a commitment to social impact

Key Expertise:

- 30 yrs. management in intl. Companies
- startup and change mgmt
- Specializes in marketing/sales

Health Threats



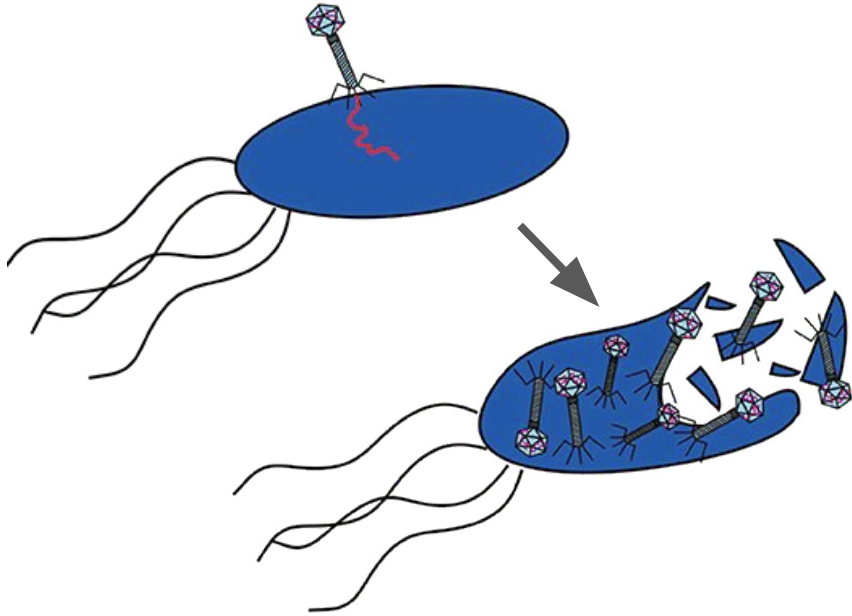
Bacteriophages the Future Formula Against AMR

AMR: Serious today catastrophic tomorrow

Currently, 700,000 people die each year from infections with multiresistant bacteria. The number will rise to 10 million by 2050 (WHO). Conventional antibiotics are becoming increasingly ineffective. An immediate response is needed.

Bacteriophage-based antibiotics are considered to be the most promising approach to address AMR.

Bacteriophages kill Bacteria



Bacteriophages (Phages)

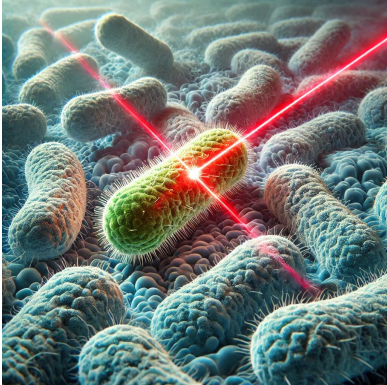
- Infect and Kill Bacteria
- Are harmless to Humans, Animals and Plants
- Are Precision Weapons not a Shotgun

Unlike conventional antibiotics, phages act extremely specific on certain bacterial strains. Therefore, for each individual phage-based antibiotic, the exact matching phage is needed. The challenge, however, is to identify the exact matching phage from the almost infinite number (at least 10^{24}) of phages.

Customer Dilemma

The Needle in the Haystack Problem

Laser Precision



Each phage targets it's bacteria with pinpoint accuracy...

The perfect match exists,

but it's hidden

in a sea of infinite possibilities

Infinite Possibilities



...but the number of Phages is endless.

Academic as well as industrial R&D groups working on phage projects face the challenge of finding the exact matching phage. The probability of finding it by searching is 1 in almost infinity. The large number and extreme specificity of phages are not only a scientific challenge, but represent the bottleneck in the fight against AMR.

Solution: The Phagestack Algorithm

Phagestack Database

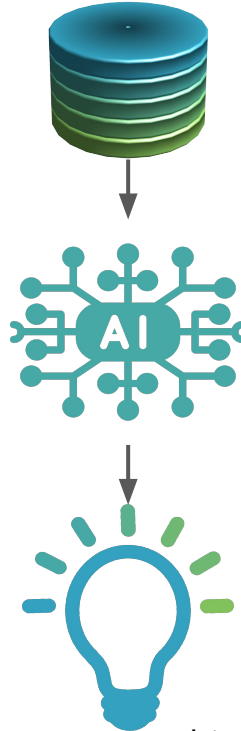
Goal: 2 Mio. Datasets
(training data)

Proprietary AI Algorithm

well trained
(machine learning)

Predicting Exact matching Phages

Vision: 99.9% Match

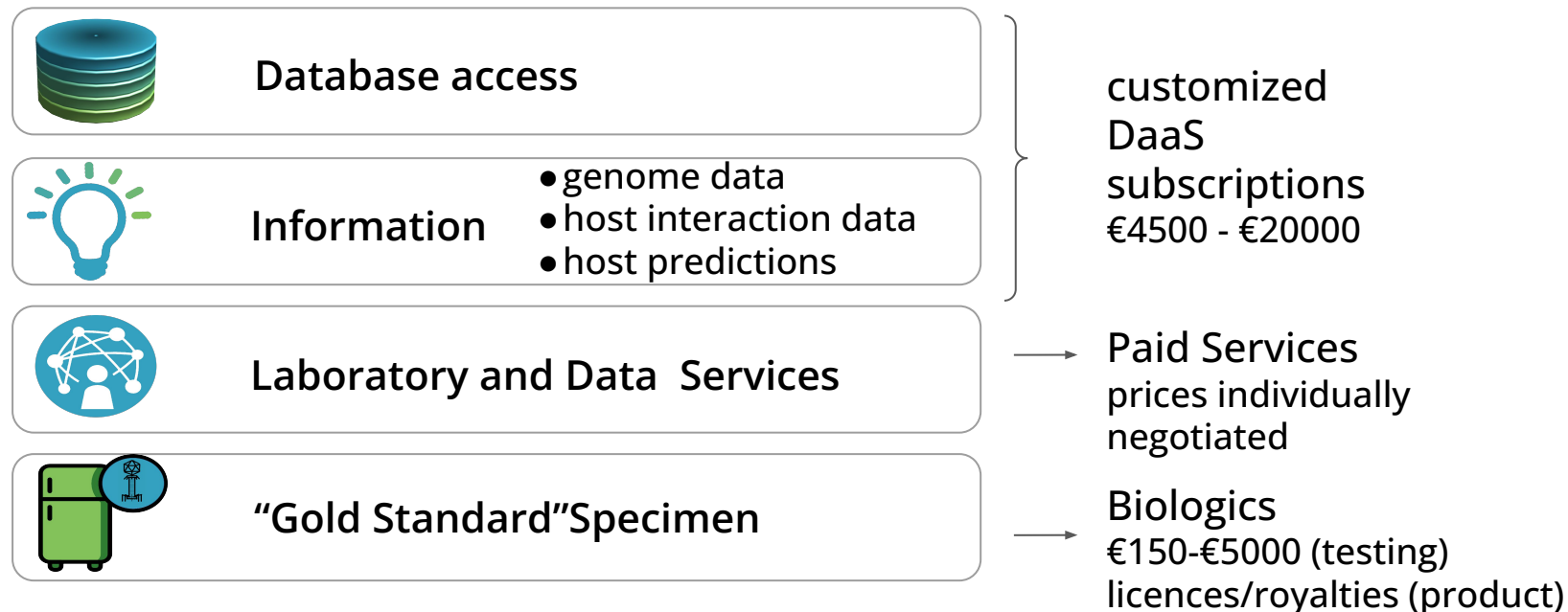


Collect

Train

Predict

We break the AMR bottleneck by delivering the exact matching phage based on the gene sequence of the bacterium to be controlled. To reach the 2M datasets goal we develop a high throughput system which can also be used for pathogen diagnosis leveraging machine learning.



The future is data-driven. Data-as-a-Service (DaaS) forms our foundation, with the value of our database and derived information growing exponentially with each new data set. Our business model also includes licenses and royalties for patentable biologics, ensuring robust long-term growth.

Business Model Upside

Addressing Customers from All Market Segments



Market Segments for Antimicrobial Products

Agriculture €9 B

Aquaculture €2 B

Livestock
Equestrian Sports
Meat Industry

Pharma €43 B

Cosmetics
Microbiome

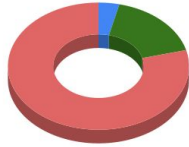
Market Entry: Agriculture, Aquaculture and Pharma Segments.

Market Expansion: Livestock, Equestrian Sports, Meat Industry, Cosmetics and Microbiome

Dual Perspective Market Estimate

Worldwide Antibiotics Market €54B
expected to grow to €86B by 2033

1



● Aquaculture €2B ● Agriculture €9.3B
● Pharma €43B

Antimicrobial R&D worldwide:

500 Academic Institutions

75 Startups

210 Pharma Companies

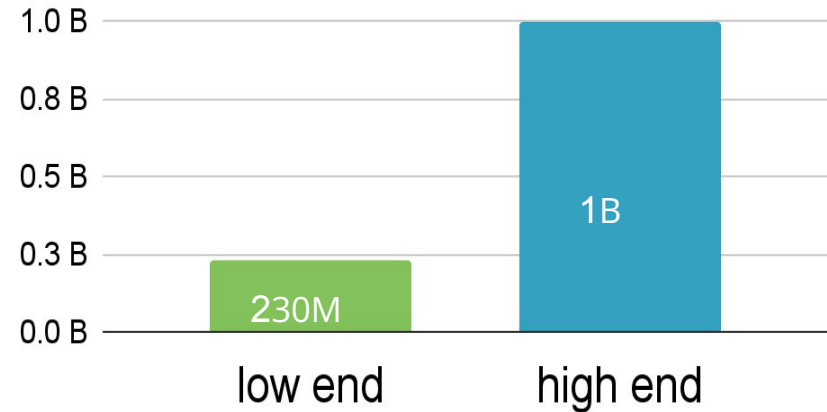
Expenses for Data/Information

\$200,000-\$10M annually

2

Result of Market Size Estimate €

From Conventional Antibiotics to Phages



Conclusion: Even in the most conservative estimates, from both perspectives 'global antibiotics market' and 'antimicrobial R&D', the market potential comprises at least 230 M

Competition and USP

	DaaS for Pharma and other Fields	High Throughput Approach	leveraging AI processes	Custom Services	Specimen Sales
Phagestack	✓	✓	✓	✓	✓
Locus biosciences, USA	x	✓	✓	✓	✓
BiomX (merged with APT), USA	x	x	x	?	✓
Proteon Pharmaceuticals, PL	x	x	x	✓	✓
PrecisionPhage FIN	x	x	?	✓	✓

Our unique selling proposition: focus on database and AI-driven solutions, without focus on specific products. This data-driven approach enables us to generate revenue in the early stages of our development.

Phagestack's Unique Advantage

Data-Driven Insights for Broad Applications

Data as a Service (DaaS):

- unlike our competitors, we provide data-driven services
- we address clients from both pharmaceutical and other fields.

Machine Learning-Driven:

- leveraging advanced machine learning algorithms
- analyze vast datasets
- offering predictive insights rather than specific products



Broad Application Spectrum:

- our platform serves a wide range of customers, from academia to industry
- we provide customized solutions tailored to various research and development needs

Phagestack Empowers Research and Development Across Disciplines

Company Formation & Expansion



- Established Phagestack GmbH
- Set up Phagestack Labs, a fully owned subsidiary in Sofia Tech Park, Bulgaria
- Seed financing secured

Database Development



- Contracted out: production level database development
- Milestone set for Q4 2024

State-of-the-Art Facilities



Phagestack Labs operates in Sofia Tech Park, an EU-supported incubator Campus in Sofia, Bulgaria

Strategic Partnerships



- Aquapurna (shrimp aquaculture)
- Bundeswehrkrankenhaus Berlin (personalized phage therapy)

Intellectual Property Strategy



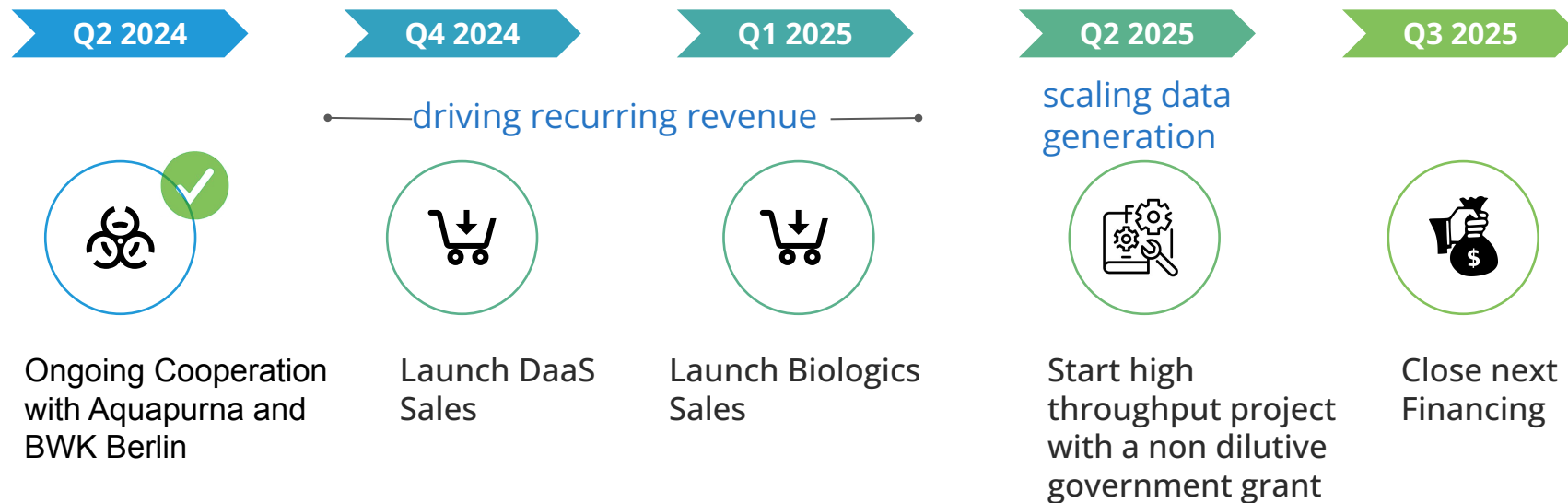
- Defined IP strategy with White IP
- Patent applications in progress for ML-based processes

Team Expansion



- Secured Legal/IP expertize
- Appointed Head of R&D
- Currently hiring a Business Manager

Key Milestones



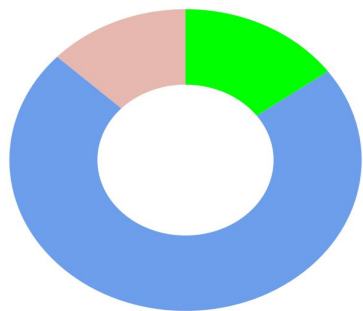
Next steps: Capturing Markets and Driving Revenue

We have laid a solid foundation for Phagestack. Phagestack Labs is operating and expanding the database, which is brought to production level by a contractor. For further growth and market expansion we will raise new capital in 2025.

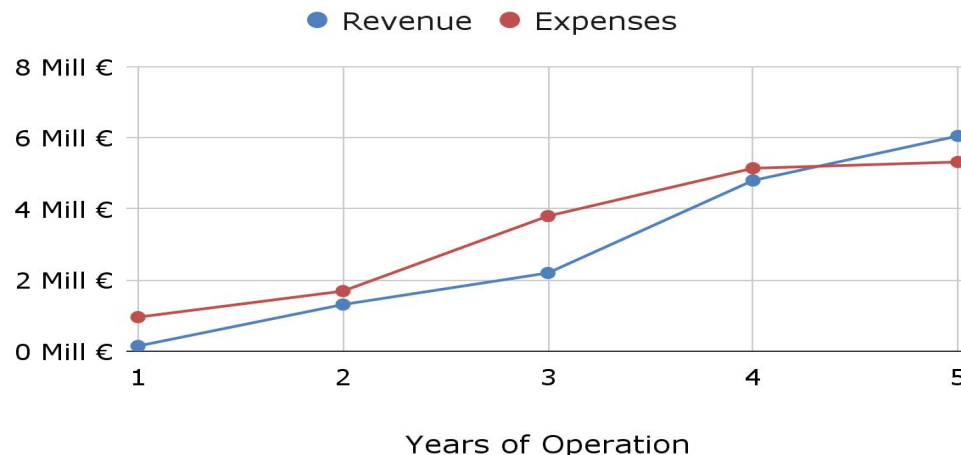
\$5M capital Needed to reach profitability **by year 5**

Second round financing to fuel market reach, team expansion, and tech advancement

Scalable Revenue from
Diversified Streams



● **Biologics** ● **DaaS** ● **Services**



Phagestack seeks \$5M in funding to fuel key growth initiatives. This financing will enable us to expand our team with strategic hires, boost marketing efforts to drive customer acquisition, and implement lab automation to scale data collection. By increasing the volume and quality of our database, we enhance the value and precision of our Data-as-a-Service (DaaS) product, positioning Phagestack for long-term revenue growth and market leadership in precision antimicrobial solutions.



Dr. Ewald Fernbach Co-founder and CEO
Email: efe@phagestack.com
Phone: +49 2238 5407092
Mobile: +49 16095149155
Mail: Adlerweg 9, 50259 Pulheim



Phagestack offers a transformative platform for developing a new generation of antibiotics. Our solutions are not only safer for both patients and the environment but are also precision-engineered to combat the escalating global threat of antimicrobial resistance (AMR).

Thank you for your time. Don't hesitate to contact us for more detailed information. Schedule a meeting online or in person.

This presentation of investment opportunities is exclusively directed at business-oriented potential partners. All information regarding the investment opportunities has been provided by the companies themselves and thus reflects their subjective assessments. The presentations do not replace a sales prospectus for these companies. The provided information is subject to risks and uncertainties, which each Business Angel must verify on their own responsibility and do not constitute an offer for participation. The presentation created contains no confidential data and is qualified for possible further distribution to third parties