



Developing a novel, efficient and antibiotic-free treatment for acne

Market need and potential

Acne vulgaris affects more than 80% of adolescents and young adults and frequently continues from adolescence into adulthood. Recent data suggest that there are 623 million people living with acne around the world. Acne is associated with lower quality of life and self-esteem and even suicide attempts. The social, psychological, and emotional impairment resulting from acne has been reported to be similar to those associated with epilepsy, asthma, diabetes, and arthritis. Current treatments are neither sufficient nor efficient enough, and the different agents cause a plethora of problems ranging from skin irritation to antibiotic resistance.

By 2026, acne treatment market size is forecast to be valued USD 4.1 billion across the seven major pharmaceutical markets: the US, France, Germany, Italy, Spain, the UK, and Japan.

Business idea

Although inflammatory acne has been well characterized clinically, the mechanisms by which inflammatory lesions arise are still poorly understood. Excessive growth of the human skin bacterium *Propionibacterium acnes*, which is normally present on the skin, has long been associated with inflammatory acne. The bacteria can form large bacterial aggregates or biofilms, which contribute to resistance towards antimicrobial agents and our immune system. *P. acnes* biofilm can also block hair follicles and directly contribute to emergence of acne lesions.

We have identified a bacterial protein that can degrade *P. acnes* biofilm in human hair follicles. The properties of the protein, which is present on normal human skin, are unique and the approach to target biofilms in acne vulgaris is novel. Our strategy is to produce the recombinant bacterial protein and use it as an active ingredient in a topically administered product.

Competition

Antibiotics are effective for acne treatment, but require at least a 12-week treatment, which may be associated with bacterial resistance. The prolonged treatment (12-16 weeks) negatively affect compliance and acne lesions may recur soon after the antibiotics treatment is stopped. There exist remedies for topical treatments too, but many modalities can cause local skin irritation contributing to poor compliance.

Advantages

Compared to the currently available acne medications our drug candidate has the potential to:

- Be combined with daily routines of applying facial cream once a day and reduce appearance of acne lesions in less than a week
- Facilitate antibiotic-free approach which is beneficial for patients, society and nature.

Current Status

We have produced the protein in a bacterial system and demonstrated positive effects in an *in vivo* model of *P. acnes* biofilm (fruit flies). We have also shown that the protein is metabolically stable at room temperature for at least 52 weeks. The regulatory demands have been evaluated and the product will be classified as a pharmaceutical. At present, a CDMO has established production of the protein in a bacterial strain suitable for large scale production. Up- and downstream processes are currently being developed. To date, we have raised EUR 1.8 million from six Swedish investors and founders. Currently, we seek investors to participate in our up and coming round of financing, closing October 2023. Our capital need is EUR 2.8 million, and the goal is to perform preclinical toxicity studies.

Contact

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IPR

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National patent applications filed.

Capital need

Approximately EUR 2.8 million to perform pre-clinical toxicity studies.
Period: October 2023 – July 2025
T1: October 23, EUR 900 thousand
T2: June 24, EUR 1.9 million

Team

Oleg Alexeyev, Founder & Inventor
Mats Strömquist, Chairman of the board
Gabriella Persson, CEO
Peter Jacobsson, Business Coach UBI
Andreas Lindberg, Business Coach UBI

Board of Directors

Mats Strömquist, Chairman of the board
Oleg Alexeyev, Board member
Claes Post, Board member
Mattias Eriksson, Board member
Jonas Sjögren, Board member
Gabriella Persson, Board member

Scientific Board/Advisors

Prof. Allison Leighton (Harrogate, UK)
Prof. Christos Zouboulis (Berlin, Germany)
Prof. Itaru Dekio (Tokyo, Japan)

Background

The project is based on research performed at Department of Pathology at Umeå University. Oleg Alexeyev has identified a novel bacterial protein with the potential to treat acne vulgaris.