Peptide-based antivenom to treat snake bites

“It is time to try and make a change in antivenom strategy, by combining or replacing antibodies with peptides”  
Brian Lohse

Problem

• Unmet clinical need for “affordable”, fully synthetic, high-quality and more versatile antivenom therapeutic products

Snakebite envenoming is a serious problem in many areas of the world resulting in more than 100,000 deaths and 400,000 serious injuries every year. Current antivenoms (antibody based) are made in animals, giving rise to immunogenic responses in humans, expensive production (horse and snake farms needed), purification, storage issues, cold-chain etc.

Solution

• Unique collection of peptide-based compounds, reactive with medically relevant toxins from major snake species

In vivo and in vitro assays done with synthesized peptide

Technology Description

By use of phage display techniques and other biotechnology procedures, we have identified and synthesized a library of novel synthetic peptide-based compounds. The lead compounds have shown activity in vitro (biochemical assays) and in vivo (mouse models). Proof-of-Concept in binding to major snake Myo-toxins, across several important venomous species such as Bothrops sp., different sp. of rattlesnakes and Bitis sp.

The novel synthetic peptides can be produced with state-of-the-art scalable chemical- or biotechnological production methods resulting in high quality compounds. These are expected to exhibit favorable side-effect profiles and “a low production cost” vis-à-vis current Ab-based envenoming products. Furthermore, it can abolish current need for animal farms, snake farms, and series of difficult purification steps and existing risks of adverse antibody based reactions toward unwanted animal derived product components.

Intellectual Property Rights (1-2 lines)

PCT/EP2019/057522, Int. filing date 26 MAR 2019, covering peptides of the invention

Current State

- We reached Proof-of-Concept by 2018/19.
- PCT application filed
- An intensive R&D plan is underway for 2019-2020 where focus is to further optimize the lead peptides, to make them more potent. This involves R&D in chemistry and molecular biology, and further structural analyses and in vivo testing.

Opportunity

• High value market (USA > 100 Mn US$, worldwide > 1.6 bn US$ (2.9 bn by 2025) with potential for addressing both human and veterinarian segments (new market e.g. pets)

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Call to action – license or R&D collaborations

We wish to attract investors to further augment our R&D in two directions. Firstly, we wish to further improve the potency of the peptides using Peptidomimetics. Moreover, work might be initiated to adapt other technologies for a more pharmaceutical profile and mature project towards clinical studies. Secondly, we seek alliances with technology companies that may take the peptide strategy out of the laboratory and into the anti-venom industry as addition to existing anti-venom or even as a replacement of existing.

Revenue by region* (US$ Mn)

*Reported on parts of the original report from TMR, numbers for (2017). With a CAGR of 6.8% (2017-2025), the global antivenom market is expected to grow to US$2.9 bn by 2025.

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