

## Healthcare industry BW

### HepaRegeniX – a start-up is taking it up a step!

**HepaRegeniX, a biotech company founded in 2016, specialises in developing drugs that restore the regenerative capacity of diseased livers. The three founders of the biotech start-up, Prof. Dr. Lars Zender, Prof. Dr. Stefan Laufer and Dr. Wolfgang Albrecht, anticipate starting clinical testing of the first drug candidate in 2019.**

The money needed for the planned trials is available. In early 2017, HepaRegeniX GmbH received nine million euros in Series A funding for the development of kinase inhibitors for treating acute and chronic liver diseases. The lead investor is the Boehringer Ingelheim Venture Fund (BIVF). Other investors include Novo Seeds, High-Tech Gründerfonds and the coparion venture capital fund.

HepaRegeniX's venture is ambitious. The company's CEO, Wolfgang Albrecht, nevertheless believes that it is realistic. The key aspects to make it work are all present: excellent research, industrial expertise, worldwide rights to the relevant intellectual property portfolio and a patient, knowledgeable lead investor. Albrecht considers it a stroke of luck that the virtual company succeeded in bringing together academic ways of thinking with those of the pharmaceutical industry and investors.

### The researchers hit the bull's-eye

The story of HepaRegeniX began in 2013 when Lars Zender, medical director of the Department of Internal Medicine VIII, Division of Clinical Tumour Biology at the University of Tübingen and liver expert, made a ground-breaking discovery: he discovered a switch that activates the regenerative capacity of a severely diseased liver. Validation experiments with classical mouse models with acute and chronic liver damage exceeded all expectations. Suppressing the activity of the switch, a kinase enzyme called MKK4, to 80% of its normal activity has an "extremely positive effect" on the regeneration of the liver. That said, it has to be borne in mind that no drug to promote the regeneration of diseased livers is yet available.

Ascenion, the technology transfer partner of the Hannover Medical School and the Helmholtz Centre for Infection Research, where Zender worked until 2012, considered the invention rather attractive. And BIVF saw establishing a company as a promising venture. At the time, Zender was working closely with Stefan Laufer, a professor in the Department of Pharmaceutical Chemistry at the University of Tübingen. The two had also founded an Academic Drug Discovery Center (TÜCAD2) in Tübingen. BIVF advised Zender and Laufer to bring on board someone with industry



Dr. Wolfgang Albrecht, CEO of HepaRegeniX GmbH  
© HepaRegeniX

experience in drug discovery and development.

This is where Wolfgang Albrecht came in. He was the long-standing head of chemical drug development at Teva/ratiopharm, and had worked with Stefan Laufer at Merckle/ratiopharm. Albrecht was looking for a career change and had first found out about Zender's and Laufer's plans in autumn 2015. The three quickly came to an agreement and Albrecht went on to develop a business plan. The future lead investor agreed and proposed a concept for securing the patent with the collecting society.

## Strong and attractive patent portfolio

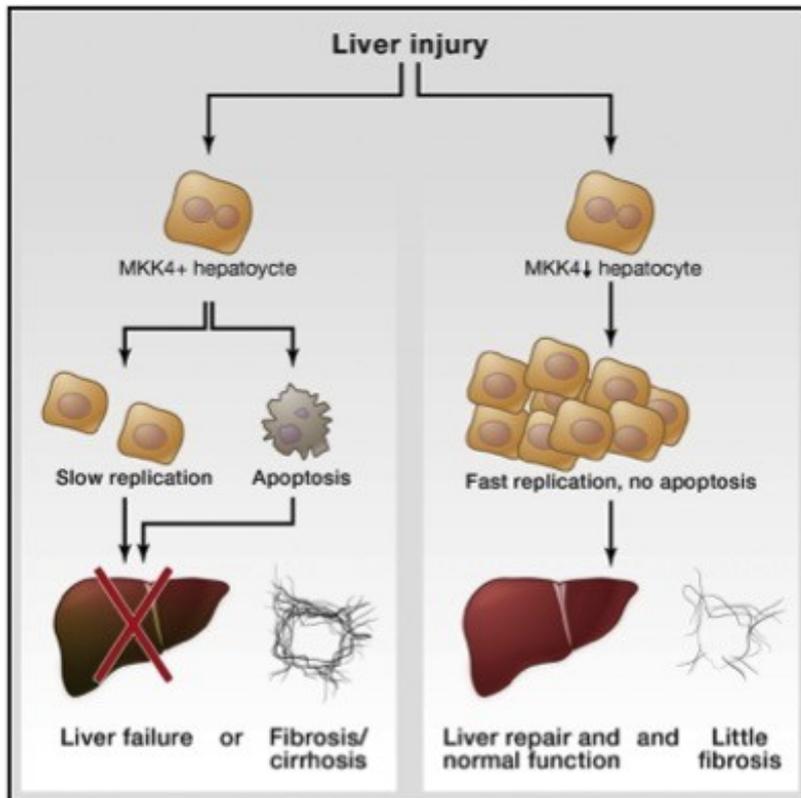
With the help of BIVF, the three founders signed a licensing agreement with Ascenion, which was equally attractive for the new company and its investors. The patent protects the use of small molecule MKK4 inhibitors for use as medications to restore the regenerative capacity of the liver for all types of liver disorders, Albrecht points out. It protects the therapeutic concept of HepaRegeniX in the largest markets worldwide.

As a virtual pharmaceutical company, HepaRegeniX carries out all experimental work associated with drug development up until the early phases (clinical Ib or II trials) of clinical development. The company relies heavily on research cooperation with the Department of Internal Medicine at Tübingen University Hospital (Zender's group) and the Department of Pharmaceutical Chemistry at the University of Tübingen (Laufer's group). Laufer's team carries out part of the chemical work associated with the drug discovery process, Zender's team is specifically focused on in vivo pharmacology. The rest is done by external research service providers under the supervision of CEO Albrecht. The advantage of virtual companies like HepaRegeniX is that they do not have to invest in hardware and laboratories. In addition to the CEO, the company only has two scientists who are also the project managers.

A lead molecule has been identified and the pharmacological and toxicological data collected as part of the medical-chemical development programme are promising. The company founders therefore assume that a clinical candidate will have been identified by the second quarter of 2018. If everything goes according to plan, the clinical phase will start in mid-2019, probably in Zender's Phase I hospital. In addition, in autumn 2017, HepaRegeniX launched another medical-chemical development programme to develop a new class of drugs that can be used to expand the range of

potential indications.

## Starting off by treating acute liver failure



Liver injury frequently causes impaired hepatocyte replication and apoptosis, leading to hepatic failure and death, or severe fibrosis. Inhibition of MKK4 accelerates the replication of hepatocytes and prevents their apoptosis, thereby permitting successful tissue regeneration.

© Willenbrink/Grompe, Cell, 2013

The compound will be clinically tested in patients with acute liver failure and in patients with a chronically damaged liver due to alcohol abuse who have relapsed into addiction and thus run the risk of total, lethal liver failure. This rather rare indication is comparable to cancer patients who have had all the available therapies but cannot be cured, explains Albrecht. This patient collective will be used to prove the feasibility of the company's approach. The approach is highly ambitious, but has been chosen because no effective therapy is currently available for such patients. Another strategic aspect is that a successful trial will considerably shorten the time needed for obtaining marketing authorisation for the drug.

Albrecht does not deny it could be possible for HepaRegeniX (and its investors) to expand the use of the compound for treating patients with chronic liver disease. However, the company will initially focus on developing a preclinical candidate for the aforementioned rare indication. Albrecht sees this as an "excellent starting point for expanding the use of the drug for other indications". Albrecht says that the verification of the preclinical findings will be "a unique selling point as far as the therapeutic potential of the compound is concerned".

Zender discovered the MKK4 enzyme as a key regulator of liver regeneration using an RNA-based screening method. However, HepaRegeniX develops small molecule drug candidates. There are several reasons for this. RNA molecules are too large to enter diseased livers. With small molecules, it is possible to achieve 80% inhibition of the kinase over the dosing period. The researchers' findings suggest that this is a high enough percentage for the drug to have a

therapeutic effect. Albrecht also points out that titration of the ideal drug dose is far easier with small molecules. If HepaRegeniX decided to expand the use of the compound for other indications, another round of financing would be required. The company does not exclude exit strategies either. However, for the time being, HepaRegeniX is losing no time in implementing its ambitious project, namely, the clinical development of an MKK4 kinase inhibitor.

---

## Article

21-Feb-2018

Walter Pytlik

© BIOPRO Baden-Württemberg GmbH

---

## Further information

HepaRegeniX GmbH

Dr. Wolfgang Albrecht

Chief Executive Officer

Phone: +49 (0)731 2650428

E-mail: w.albrecht(at)heparegenix.com

▶ [Start-up HepaRegeniX GmbH](#)

---

## The article is part of the following dossiers



Advances in the study and treatment of liver diseases

# HepaRegeniX



delivering recovery

funding

financing

liver

regenerative  
medicine

study

clinical  
trial

company foundation

patent

signalling  
pathway

therapy

RNA

active pharmaceutical  
ingredient

kinase