

Life Sciences Review

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GENOMICS
EDITION

**CURING THE
INCURABLE
WITH PRECISION
MEDICINE**

**Arctic
Therapeutics
International**



Ívar Hákonarson,
CEO

\$15



ARCTIC THERAPEUTICS



**TOP 10
GENOMICS
SOLUTIONS
PROVIDERS
IN EUROPE/UK
2022**

The annual listing of 10 companies in Europe/UK that are at the forefront of providing Genomics solutions and impacting the industry in the region

Arctic Therapeutics International

CURING THE INCURABLE WITH PRECISION MEDICINE

“
THE MOST IMPACTFUL
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40-50 PERCENT OF
ALZHEIMER'S PATIENTS
HAVE DEPOSITS
SIMILAR TO THOSE WITH
HEREDITARY DEMENTIA
”

Hákon Hákonarson,
MD, PhD,
Founder and CMO

Anation built upon one of the youngest islands in the world, Iceland is home to incredibly picturesque scenery and a population that often boasts a long, healthy life owing to the country's rich ecosystem. The modern environment is much more mellow compared to its harsh predecessor, which meant only the strongest of genes were passed down through the generations. The people of Iceland are undeniably the descendants of hardened tribesmen, capable of holding their own against nature and time.

However, the unfortunate curveball dealt in the form of disease exists in every civilisation. The Icelanders are no exception.

With such a uniqueness coursing through their veins, the Icelandic people also carry a very uncommon neurological disorder specific to them in their genes called hereditary cystatin C amyloid angiopathy (HCCAA). A type of amyloid disease, HCCAA is a fatal condition that causes the progressive loss of cognitive functioning. Individuals with this particular mutation of the cystatin 3 gene are likely to experience a stroke between the early ages of 20 and 30, suffering neural degeneration, dementia, and a very short and low

standard of life thereafter. To make matters worse, HCCAA has so far been observed to be an incurable disease.

This situation and the word 'incurable' simply do not sit right with the people of Arctic Therapeutics International (ATI), a pioneer in precision medicine and drug discovery. Dr. Hákon Hákonarson MD, PhD, an internationally lauded medical professional, founded ATI in 2015 to commercialize the genetic discoveries that he has made throughout his career to deliver new and better drugs to the international marketplace. It works towards genetically sequencing, analysing, and mapping the genetic causes for diseases at a granular level and then using that information to find better ways to cure them. Dr. Hákonarson is the Professor of Pediatrics and Endowed Chair of Genomics at The University of Pennsylvania, and his proven experience in the field of applied genomics further solidifies ATI's standing as a developer of novel drugs.

The mission for ATI's highly driven and motivated team revolves around providing genetic explanations for diseases, like HCCAA, and procuring the most effective drugs that promise desirable results. And, owing to the fact that the company maintains access to a biobank and a massive genealogy database of the Icelandic population, ATI seems to be perfectly poised to deliver effective, evidence-backed medicines.

"We are bringing new drugs to the market for both common and rare diseases some of which help in the cases of orphan diseases that, from a historical perspective, have had no cures," expresses Ívar Hákonarson, CEO of ATI.

The company comprehends the many opportunities that the shift in modern medical technologies has created as well and utilises them to achieve its holistic, patient-centric goals. More specifically, ATI's projects are based on three fundamental aspects; genetically

informed drug development, genealogy, and IT. The company's vision is to empower researchers and drug developers with the ability to predict, with more accuracy than ever, the best treatments for diseases, all while considering the innumerable variables at play within each individual's DNA.

Developing drugs after sourcing high-quality genetic information enables researchers and other clinical professionals to repurpose or improve existing drugs with extensive data that goes beyond phase 2 trials. The data then supports researchers with invaluable insights and increases their chances of identifying drugs that are more likely to work, resulting in higher success rates and a faster time to market. Arctic Therapeutics currently has five such drugs in its pipeline.

Incorporating a strong focus on genealogy is a close second in the priority list for any precision medicine-based approach to drug discovery, and ATI's corporate infrastructure is built to suit just that. Its Nation-Wide Genealogy Database contains information on large family pedigrees and genetically homogeneous data.

In the context of IT, adapting and staying one step ahead of the market has not been difficult for ATI due to its leadership team's comprehensive domain expertise. The company was established in the cloud and has a very scalable and efficient IT environment,

leveraging the newest features and functionality of these services, operated under the strictest security standards. Their attention to detail around the many advancements made in drug development processes has helped the company successfully capitalise on precision medicine early.

ATI, bringing together all these resources, is redefining modern drug discovery and development practices across the globe. The current ATI pipeline consists of five drug development projects aimed at treating ailments ranging from dementia and autoimmune disorders to acne vulgaris. Most of their

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Katrín Björk Guðjónsdóttir

drugs have multiple indications for more than one linked disease, which they are informed of given the genetic discoveries behind them. It is important to note that of the five drugs under development, three are quickly moving through their clinical trial phases, including indications in the veterinary space, where ATI is developing therapies for autoimmune uveitis in horses and atopic dermatitis in dogs.

The AT-001 drug has completed its phase IIa trial in a rare form of human neurodegenerative disorder known as HCCAA. Phase IIb/III encompasses the treatment of vascular insults and dementia in patients with cerebral amyloid angiopathy (CAA) in Europe, following which ATI is confident it will have enough supporting data to pursue Alzheimer disease, of which HCCAA and other CAA's are facilitated forms of.

"Dr. Hákonarson says that the most impactful opportunity of our approach is the possibility of establishing a new treatment for Alzheimer's disease. 40-50 percent of Alzheimer's patients have deposits similar to those with hereditary dementia." When asked, Hákon says that if everything goes according to plan and the results are positive, larger pharmaceutical companies will engage in discussions with the company in the near future. "Thus, we plan to enter into a license agreement with a pharmaceutical

company that studies Alzheimer's disease in a couple of years."

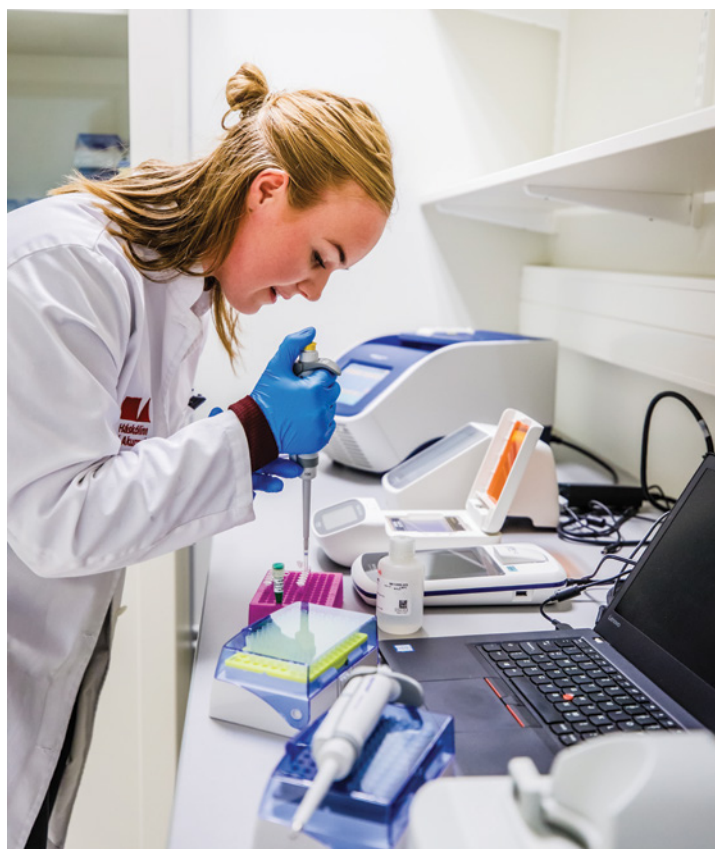
The drug that ATI expects to be the company's first drug to market is AT-004, as soon as in 3-4 years. To begin with AT-004 is being taken forward for its strongest indication which the company believes will impact the most patients lives, acne vulgaris. A Phase II trial will commence early 2023, this new drug having a completely different mechanism of action than any of the current treatments available. Pre-clinical results show similar or better efficacy to the lead products available in the market, but with absolutely no side effects. The drug has also shown phenomenal results in the treatment of psoriasis, atopic dermatitis, rosacea and anti-aging (wrinkles and age spots). An increased rate of wound healing has also been observed so the future use potentials are substantial.

"Acne affects over 600 million people globally, and currently, there are no good treatments available. Most of the effective acne therapies have significant side effects. AT-004 has a completely different mechanism of action and we are seeing comparable or better results with AT-004 without any of the side effects. AT-004 has a completely different mechanism of action than these drugs, but we are seeing similar or better results without any of the side effects," states Ívar.

There are also multiple veterinary indications of relevance in the drugs in ATI's pipeline, for example in AT-002 and AT-004; which both are currently in active veterinary trials which is yielding valuable data before the company enters the expected phase II trials in humans in 2023. In these studies, AT-004 is showing very good results with atopic dermatitis in dogs and AT-002 in curing horses from uveitis, an inflammation in the uvea, the middle layer of the eye. In the case of human application, AT-002 is designed to treat human uveitis, the rare juvenile dermatomyositis (JDM), cytokine storm syndrome, an autoimmune condition.

"Our AT-002 drug showcases the ability to stop the occurrence of cytokine storms and reverse their effects. We can observe huge potential for combination therapy as likely applications for these drugs in the future," says Ívar.

Lastly, AT-003 is directed towards the treatment of various autoimmune diseases such as MS, diabetes, and autoinflammatory conditions as well. ATI developed AT-005 to help treat severe asthma attacks triggered by RV-C in patients who possess genetic variants in their CDHR3 gene and is the only drug in the company's pipeline that is pre-clinical.




While ATI's drugs are currently in their developmental stages, the results obtained from various trials and testimonies go beyond expectations. In particular, the AT-001 medication has helped Katrín Björk Guðjónsdóttir, an individual who suffered a massive stroke at 21 and another several months after due to her rare Icelandic genetic disposition, improve her standard of living and odds of survival against the local Icelandic dementia disease known as HCCAA. "AT-001 is my lifeline. The efforts made by Arctic Therapeutics are literally saving my life," shares Katrín.

The genetic explanation for this disorder in Icelandic people has already been expressed, marking ATI's starting point in its journey to save Katrín and others like her. The company extensively studied all the drugs that could possibly affect the genome, or area of insult in the brain, and subsequently established AT-001 as the most effective therapy. This new chemical entity outperforms other medicines available in the market, and has strong patent protection.

ATI is currently in partnership with Nacuity Pharmaceuticals, Inc, a biopharmaceutical company, to safely fast-track clinical trials and get access to this life-saving drug and bring it to market as soon as possible.

Developing such a comprehensive set of projects in full swing, ATI is showcasing the value of precision medicine in Iceland and is breaking ground in international markets. It may be an early-stage company, but with five extremely reassuring drugs fairly far along in their development, the genomic drug discovery expert is playing its part in disrupting the current medical landscape.

Ensuring that each product causes negligible to no side effects is an important facet of ATI's policies. For this reason, the company recently established the only privately owned, ISO 15189:2012-certified medical laboratory in all of Iceland. The facility is packed with world-class equipment and strictly adheres to the many regulatory requirements, enabling ATI and its collaborators to conduct studies and trials themselves.

ATI intends to change the world by being the vehicle that brings new and better drugs to the market and helps people live better, healthier lives. The company will be entering its next round of fundraising soon and expects, as it has experienced in the past, many large and small players from varying industries to involve themselves in this revolution. The future is precision medicine and ATI is truly leading the way. 

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