Sulfateq BV

Background information

- Sulfateq BV is a biotechnology research company, located in Groningen, the north of the Netherlands.
- Founded in April, 2011 by Drs Kees van der Graaf, a successful entrepreneur in biotech-start ups.
- It exploits a revolutionary, disruptive technology based on the identification of compounds based on research in hibernation.
- Close working relations with the University of Groningen.
- It has a worldwide network of research collaborations including a CRADA with the US Army Institute of Surgical Research.

Commercial Products

- In 2013 ROKEPIE®-S01 was launched for the R&D market in Drug Discovery and Regenerative Medicine.
- ROKEPIE®-S01 is a unique hypothermic preservation additive to store and transport cells and tissues at low temperatures (2-8°C.)
- It is currently in the introduction phase with several companies testing or using it for different applications.
- ROKEPIE® is a for Research Use Only product.
- Patent number:
  - WO 2011 / 128458 A1
  - PCT/NL2013/050915

Websites

- www.sulfateqbv.com
- www.rokepie.com

Team and Organization

- **Kees van der Graaf** **CEO**
  Serial entrepreneur | Owner, Citeq B.V.
  Successful in development of biotech start-ups

- **Andre Goossens** **CFO**
  Financial expert with extensive international experience

- **Stef Stienstra** **CSO**
  Strategic & creative development manager in biomedical science

- **Sonja van der Veen** **CCO**
  International Marketing & Commercial strategy professional

- **Bernard van Vliet** **Scientific program director**
  Successful track record in early drug discovery (pharmaceutical industry)

- **Pieter Vogelaar** **COO**
  Research & Development

Up-to-date facilities & laboratory equipment

University collaborators

- Rob Henning Groningen
- Herman Meurs Groningen
- Martina Schmidt Groningen

Hibernation applied in Life Sciences

Objective

- Use of the protective mechanism of hibernation in therapeutic applications
- Development of compounds with potential for multiple applications

Rationale

- Hibernation limits cell and organ damage during stressful conditions
- Identification of structural analogues of endogenous protective compounds

Current Status

- New proprietary small molecules
- High potency molecules
- Demonstrated efficacy in pre-clinical studies
- ADME studies supporting drugability of compounds
- ROKEPIE® publicly available for research applications only

Conclusion

- Owner of new proprietary chemicals with a broad applicability
- Cell / tissue engineering
- Therapeutics

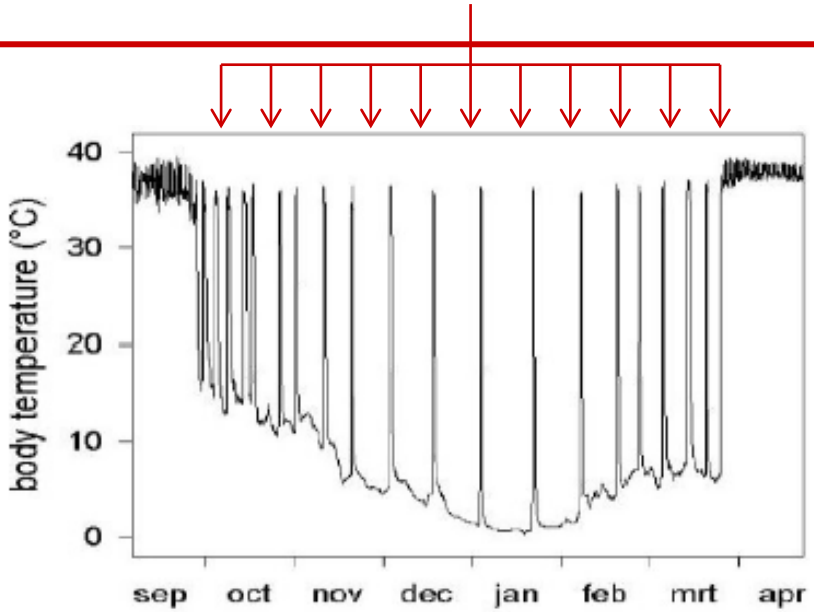
Hibernation & Bioregulation

Natural resistance against difficult circumstances

- Bears and other species use the protective mechanism of hibernation.
- Hibernation is nature's solution for surviving harsh times.
- Surviving through a period of low food supply and cold temperatures.

Interesting phenomena

- Mammal survives by minimizing energy need.
- Low oxygen consumption and body temperature.
- Long-term sufferings like hypothermia, starvation and disease susceptibility.
- The animals have developed a suite of adaptations to protect mind and body.
- No signs of severe damage to tissue or brain.



Before hibernation: Fit & Fat

After hibernation: Immediately active

Biomimicry & Drug Development

Hibernation & Human Medicine

- In hypothermic state, hibernators can survive far worse injuries than at normal body temperatures
- Tissues are protected at low metabolic rates
- The heart is pumping blood at a fraction of the rate it usually does.

→ A non-hibernator like a human cannot survive deep hypothermia without medical assistance.

Bioregulation as drug development

- Protective mechanisms of several hibernators against cold, inactivity, starvation and asphyxiation

Examples

- Lung tissue of hibernators resemble asthma, but is fully reversible after rewarming
- Cells and tissues of hibernators become cold but remain fully functional after rewarming
- Hibernators are able to store blood platelets at low body temperature successfully

Sulfateq has used these examples of hibernation for therapeutic applications. This has led to the development and synthesis of effective chemical compounds.

Conclusion: Biomimicry - Using these valuable adaptations in nature to hijack them for the benefit of breakthrough innovation in pharma.

Market Potential

Drug development

- COPD (€ 500 million–2 billion)
- Surgery / Anesthesia (€ 2-40 million)

Drug development in potential

- Obesity / Diabetes II
- Hemorrhagic fever

Medical Devices

- Blood products e.g. platelets (€ 2-10 million)
- Organ transport (€ 2-10 million)

- R&D Market + extension
- ROKEPIE®-S01 Product (€ 1-10 million)

This patented group of molecules is Cool.

Sulfateq has brought this technology to a level where key aspects have been proven and the focused potentials must be further developed.

(ROKEPIE® is an preservation product developed by Sulfateq BV)

IAG is a grant of the Province of Groningen

Commercial development Potential

Therapeutic application	Market potential million € per year
Asthma / COPD	500
Organ protection during surgery	2-40
Platelet preservation in blood banks	2-10
Preservation of organs for transplantation	2-10

Required Capital (1 NCE – 1 indication)

Project activity	Costs million €	Duration
IND application 1 NCE	3.5	2 y
Phase I	1.5	1 y
Phase II	6	2 y
Phase III	tbd	tbd

Milestone based investment plan is in place

Required Capital (2 NCE – 2 indication)

Project activity	Costs million €	Duration
IND application 2 NCE	6	2 y
Phase I	3	1 y
Phase II	12	2 y
Phase III	tbd	tbd

Milestone based investment plan is in place