



Sundew enters multi-year collaboration with US Government to control aquatic invasive species in USA

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Sundew ApS (www.sundew.bio) announced today that it has signed a five-year Cooperative Research and Development Agreement (CRADA) with the US Geological Survey (USGS). The program is focused on using Sundew's proprietary algal RNA-mediated interference (RNAi) technology to combat aquatic invasive species which have established themselves in lakes, rivers and waterways of the United States.

Invasive species are one of the biggest environmental challenges of our times. Aquatic invasive species can cause significant ecological harm by outcompeting or replacing the native flora and fauna or act as environmental engineers by modifying habitats. They frequently reduce the resilience of ecosystems to climate change. They also cause significant economic losses to communities (e.g. loss of fisheries, fouling of water intakes, reduction in drinking water quality, loss of leisure and tourism revenues) and, in some cases, they pose a threat to human health (e.g. the Asian tiger mosquito).



Invasive Asian Carp in the US Ozarks

Sundew will work with the USGS to develop and test RNAi-based approaches for controlling aquatic invasive species. USGS has a long history in the development and testing of controls of aquatic invasive species and has begun research to evaluate the potential of RNAi as a control tool for aquatic invasive species.

RNA-mediated interference (RNAi) is a simple and rapid method of silencing gene expression in an organism by degrading the messenger RNA (mRNA) that conveys the organism's genetic code to the functional "machinery" of its cells. With careful design this method can be used to target key developmental or metabolic processes by using the organisms own cellular mechanisms to degrade its mRNA, effectively silencing the genes needed for those processes to be successful. Scientists traditionally used RNAi to identify the function of a gene, but RNAi has now become more commonly used in pest management due to its ability to specifically target the pest while not impacting other organisms.

Sundew's microalgae technology enables cost effective production of the RNAi, provides a convenient delivery mechanism that can be integrated in a wide variety of formulations and protects the RNAi throughout the entire manufacturing and delivery process. This approach has distinct advantages because it offers the potential to provide species-specific control at many lifestages of the organism with little or no impact on non-target species.

The five-year CRADA will identify specific gene targets and develop microalgae capable of delivering an effective RNAi dose. It will also evaluate how effective the RNAi microalgae is against a target aquatic invasive species and assess potential ecological effects.

Giovanni Salerno, Sundew's CEO, said: *"we are delighted to be working with USGS and with this validation of our approach. We believe that this is a big step in our efforts to develop useful tools in the fight against aquatic invasive species"*.

"The USGS is happy to partner and collaborate with Sundew. This is exciting research toward the development of products that may help control the spread of invasive species with the potential for fewer ecosystem impacts." said **Dr. Jon Amberg, PhD** – Supervisory Biologist with the USGS – Upper Midwest Environmental Sciences Center.

About Sundew Aps

Sundew Aps is a Danish venture focused on using advanced biological tools to fight aquatic pests, diseases and invasive species. Modern biology offers the capability to provide effective, affordable and environmentally benign solutions to the many pest, disease and ecological problems afflicting the world's oceans, seas, lakes and rivers.

Sundew is building a portfolio of products based on two fermentation-based technology platforms: **Natural ingredients and aquatic beneficial organisms**. Sundew's most advanced product from this platform works against multiple protozoan parasites. One of the most important is Ich, a parasitic disease caused by the protozoan *Ichthyophthirius multifiliis* (otherwise known as fish white spot disease or *ich*). It is a major disease of freshwater fish, including such species as koi, rainbow trout, young salmon, catfish and carp.

Algal RNA. This can both protect aquaculture species against disease and target aquatic invasive species. RNA and RNAi are becoming increasingly important as a treatment in human therapeutics and vaccines but require specific delivery mechanisms for use in aquatic environments. Since algae are a major component of many aquatic species' diets, they have many advantages when used in this way.

This CRADA opens up an important new market for Sundew, whose RNAi technology is perfectly adapted for the control of invasive species – species that cause massive ecological damage as well as having a global economic impact measured in billions of dollars.

About USGS

Created by an act of Congress in 1879, the U.S. Geological Survey has evolved over the decades, matching its talent and knowledge to the progress of science and technology. The USGS is the sole science agency for the Department of the Interior. It is sought out by thousands of partners and customers for its natural science expertise and its vast earth and biological data holdings. The USGS provides science about natural hazards, natural resources, ecosystems and environmental health, and the effects of climate and land-use change.

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