ProBone: New tools for prospecting the marine bone-degrading microbiome for new enzymes

- The ProBone project is important for development of tailored enzymes to facilitate future bio-based processes and products for increased profitability and sustainability in the meat and poultry industry

- Norilia

415 000 tons

Photo: Arne Egil Tønset/NRK

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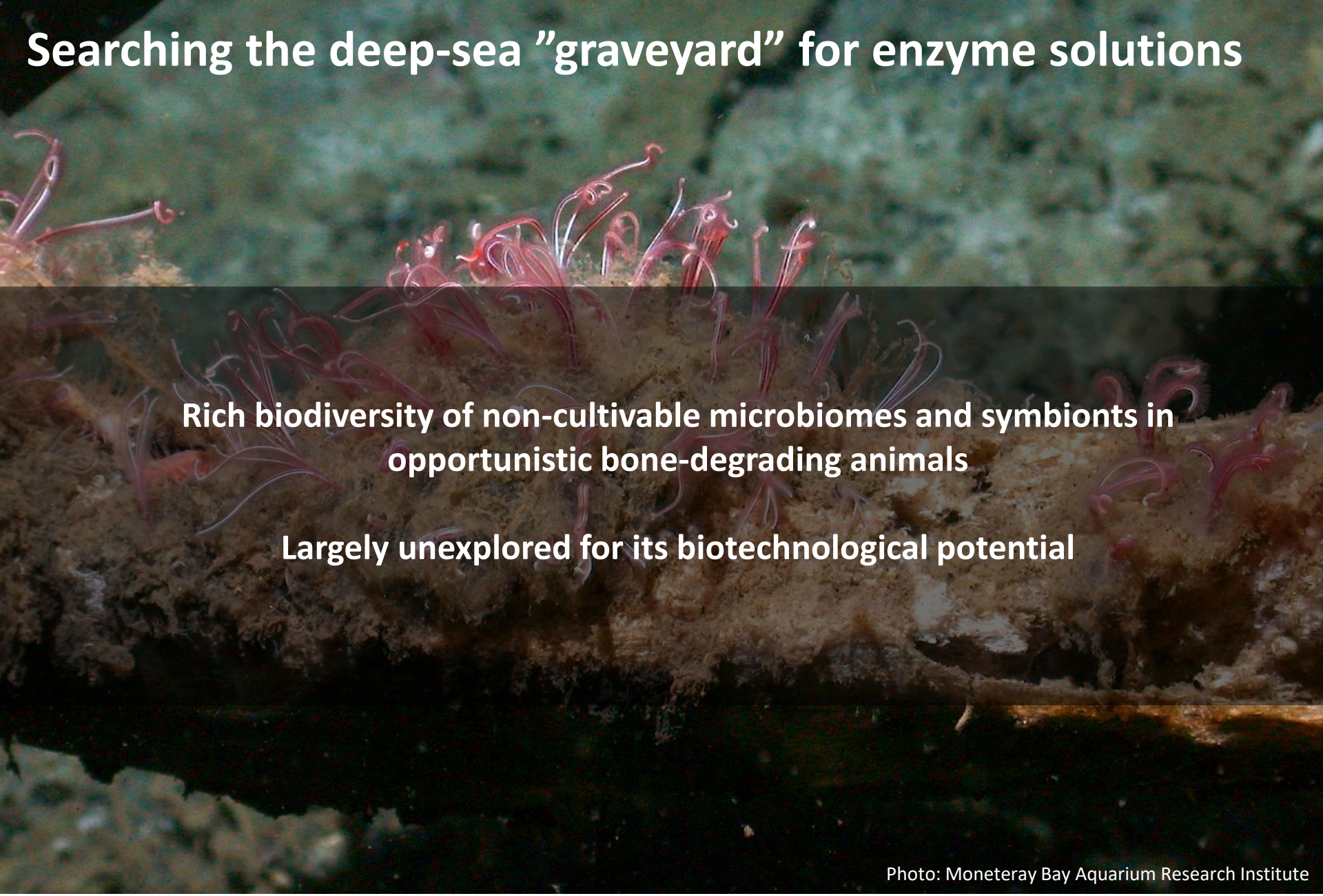
Searching the deep-sea ”graveyard” for enzyme solutions



Rich biodiversity of non-cultivable microbiomes and symbionts in opportunistic bone-degrading animals

Largely unexplored for its biotechnological potential

Photo: Moneteray Bay Aquarium Research Institute

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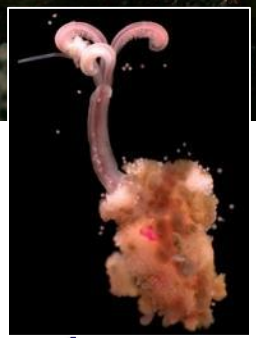
Pre-history of ProBone: From an idea to project funding



norilia

NorZymeD

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ERA-NET MarineBiotech

Kick-off

2004 2005 2009 2013 2014 2016 2017 2018

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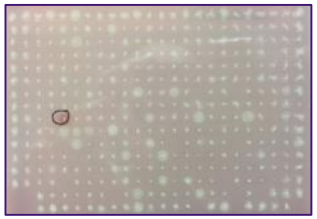
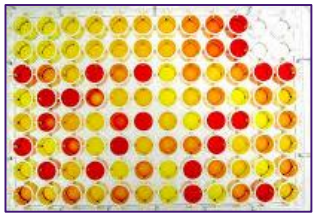
CSIC Tailorzyme GlycoSpot GEOMAR norilia

An *ad hoc* project structure to delivering an innovative toolbox based on omics technologies and synthetic biology

WP2	Sampling		• eDNA • mRNA/cDNA • Protein
WP3	Omics		• Sequencing and data analysis • Identify enzyme candidates • Data integration
WP4	Library		• Library production • Functional screens in tailor-made platforms
WP5	Expression		• Expression host development • Enzyme production
WP6	Activity		• Develop customized assays

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Omics and synthetic biology can expedite discovery of new enzymes, and accelerate the transition from discovery to end-user applications

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Tailorzyme
CUSTOMIZED ENZYME SOLUTIONS

GlycoSpot

norilia

MarineBiotech

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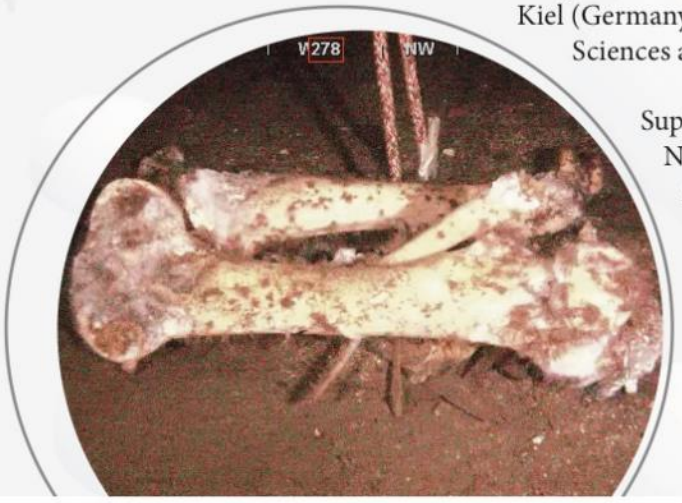
BONE-EATING WORMS IN THE OCEAN,
- and how they can supply enzymes to the industry

New and better animal feed products from protein-rich residual raw materials are being developed. The industry, however, lacks custom-made enzymes that break down bones efficiently.

"We must constantly explore the possibilities and be creative and innovative in the search for the best enzymes"

This year Gro Bjerga and her colleagues in Uni Research deposited slaughterhouse bones at 100 meters depth in the fjords outside Bergen. The researchers' goal is to attract organisms that degrade bones, such as free-living bacteria as well as bacteria that live inside the bone-eating worms. Throughout the ProBone project researchers want to develop a toolbox of methods for finding the bone-degrading enzymes.

Bjerga at Uni Research coordinates an international research team in the ProBone project. They have extensive and comprehensive knowledge in marine biology, microbiology, bioinformatics and biochemistry. The other partners are GEOMAR Helmholtz Center for Ocean Research Kiel (Germany), CSIC Insitute of Catalysis (Spain), The University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca (Romania).



Supporters of the ProBone project are Norilia AS, GlycoSpot AS and Tailorzyme AS. Norilia is responsible for selling and optimizing 150,000 tonnes of residual products from the meat and poultry industry, with a current turnover of NOK 500 millions.

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