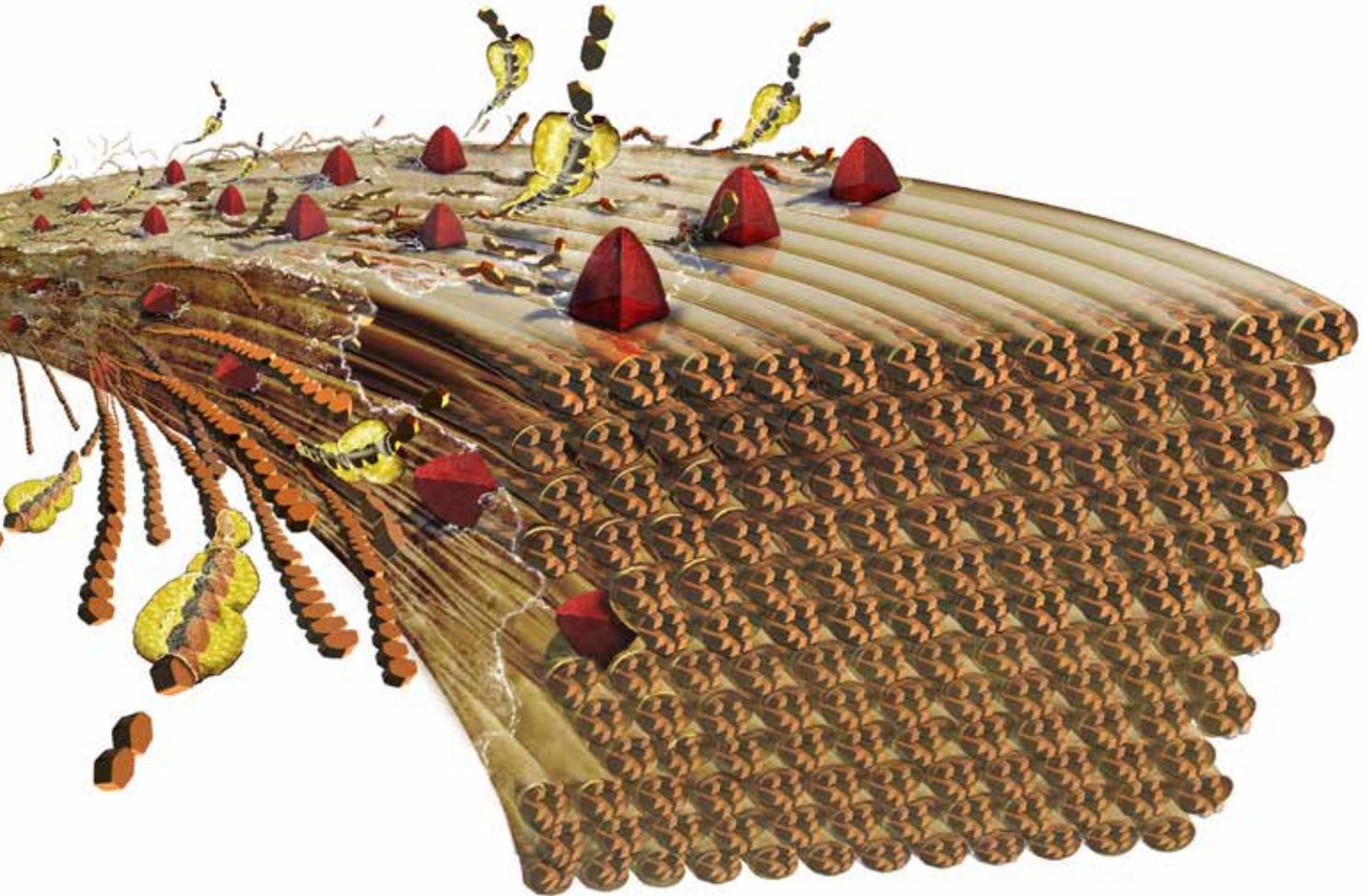


Norges miljø- og
biovitenskapelige
universitet



Avslutningsmøte i NorZymeD
Vitenparken, Ås, 18.oktober 2018

NorZymeD- Enzyme development for Norwegian biomass

Bio-economic thinking is based on maximizing the sustainable use of renewable resources, such as biomass, and on using processing technologies that are as green as possible. Thus, using Nature's own tools for biomass processing is a key to success. NorZymeD has worked on discovering and developing Nature's most important toolset, enzymes, the ultimate goal being development of tools that are tailored for Norwegian biomasses and business opportunities. NorZymeD has focused on developing both enzymes and enzyme-driven biomass processing strategies for value chains where Norway has clear competitive advantages. We have primarily been working on lignocellulosic materials (from plants and trees) and marine co-products from fisheries.

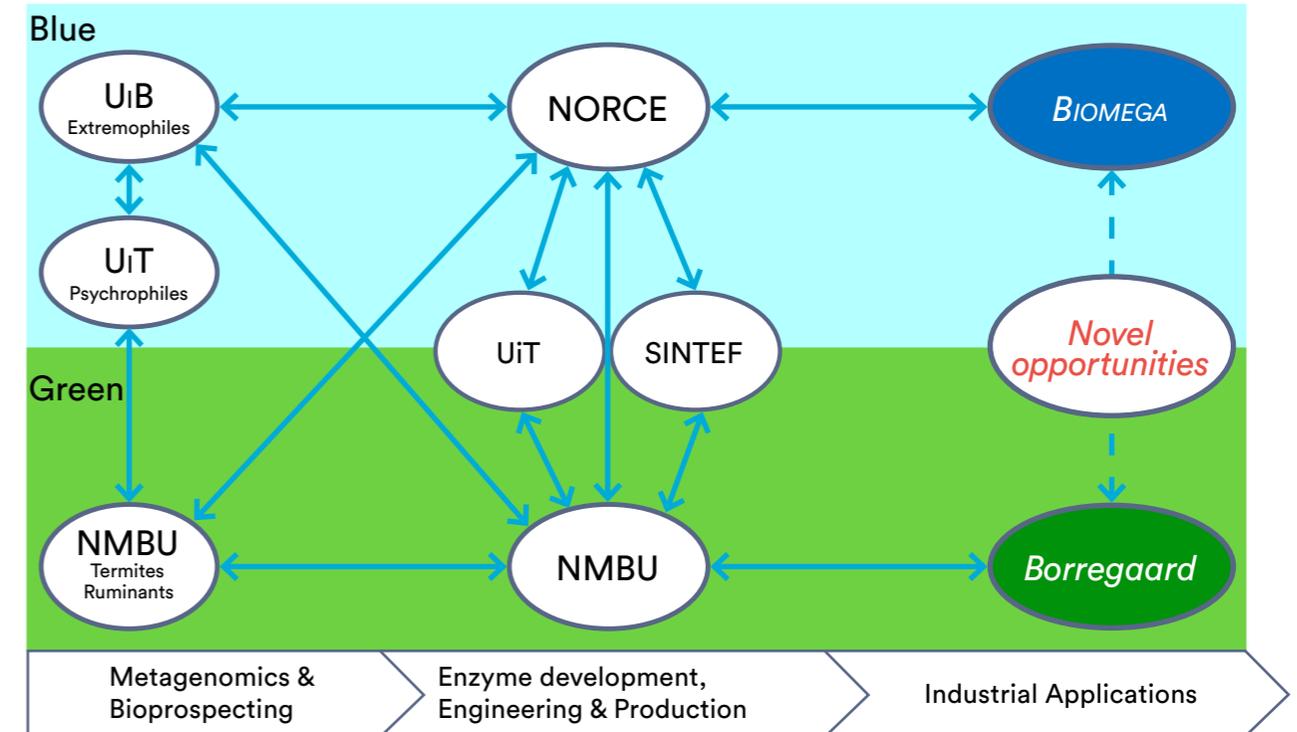
NorZymeD has been combining competence from all over Norway, both in enzyme development and in enzyme applications. Applied aspects were focused on the needs of project partners Borregaard and Biomega, but other opportunities for industrial application of NorZymeD output have also been addressed. Today, several projects build on NorZymeD output.

Uniquely, NorZymeD entailed true national collaboration by a group of research teams with a clear common goal. Every partner had its natural position and tasks in the consortium. Next to a large series of enzyme candidates and forward steps in process optimization at the industrial partners, the most important result of NorZymeD is a drastic increase in national competence in all areas of enzyme development and application.

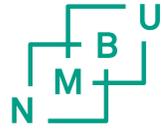
Biotechnology for innovation (BIOTEK2021)



The NorZymeD network



As part of NorZymeD, the Centre for the Study of the Sciences and the Humanities (UiB) and the Fridtjof Nansen Institute performed concomitant research on the ethical, legal and social aspects (ELSA) of NorZymeD itself. The research focused on principles for access and benefit sharing of genetic resources. The work also included continuous ELSA capacity building in the entire NorZymeD project group.



Norwegian University of Life Sciences

NMBU, with its world renowned competence in fundamental and applied enzymology, has been leading the project. NMBU has worked on producing, characterizing and engineering candidate enzymes and on development of advanced methods for in-depth analysis of enzyme properties. Candidate enzymes have been used in developing bioprocessing methods for lignocellulosic biomass, primarily in collaboration with Borregaard.



UiB has an extensive expertise and knowledge in exploration of deep-sea hydrothermal systems, focusing on the Norwegian systems located on the Arctic Mid-Ocean Ridge. These are environments with extreme environmental conditions in regard to temperature, pH and pressure. UiB has provided genetic resources, (meta) genomes, in situ enrichments, unamended samples and microbial isolates from the Arctic Mid-Ocean Ridge vent fields.



Norilia AS is responsible for increasing the value of sidestreams from the Norwegian meat and egg industry. Norilia sees enzymatic processes as an important way to increase the value of co-streams and has implemented these processes in its new Bioco biorefinery. Our collaboration with NorZymeD, since 2014, has been helpful in defining future opportunities for enzymatic processing to increase the value of our raw materials.



Biomega Group AS
At Biomega we believe in accelerating biorefining by transforming high quality salmon food grade material into world class ingredients. We have developed and patented a unique technology using the continuous enzymatic hydrolysis process which preserves the natural ingredients and ensures minimum waste by full utilization.



UiT - The Arctic University of Norway is the world's northernmost University. The Arctic location gives unique opportunities for bioprospecting both on land and in the sea. In the project, we have through DNA sequencing, provided genes encoding enzymes for biomass degradation and conversion. In addition, we have solved 3D structures of enzymes produced by the NorZymeD partners.



SINTEF has contributed through its section for biotechnology and nanomedicine. Our technology is used in development of pharmaceuticals, vaccines, biomaterials, enzymes, food, feed, chemicals and energy. The robotic screening facility at SINTEF, Trondheim, is optimized for high throughput analytical and cultivation work and enables us to process thousands of samples or cultures per day.



Borregaard AS is one of the leading biorefineries in the world with production and marketing of specialty cellulose, microfibrillated cellulose, lignin based performance chemicals, vanillin, and 2G bio ethanol. Borregaard's BALI technology, now in demo stage, will convert biomass to lignins and sugars for chemicals. Enzymatic hydrolysis of cellulose is essential in this process, and the development has benefitted from the collaboration within NorZymeD.



In 2018, Uni Research became part of NORCE. NORCE delivers research and innovation in energy, health, climate, environment, society and technology. In NORCE, biotechnology is driven towards key societal challenges by creating new and sustainable industrial processes to reduce carbon emissions, provide access to food and improve health services. Here, enzyme research facilitates new, eco-friendly solutions for the bio-based industry. In NorZymeD, new enzymes are discovered and developed with partners



Program

09:15 - 10:00	Registrering og kaffe
10:00 - 10:10	Velkommen <i>Mari Sundli Tveit, rektor ved NMBU</i>
10:10 - 11:10	NorZymeD, et blått og grønt flaggskip for strategisk næringsrettet forskning
	NorZymeD-prosjektet <i>Vincent Eijsink, professor og prosjektleder for NorZymeD, NMBU (7 min)</i>
	Nye enzymer: For pælemark er alle gode ting «tre» <i>Bjørn Altermark, forsker, UiT (7 min)</i>
	Fra nye enzymer til verdiskapning – I <i>Gro Bjerga, forskningsleder, Uni Research Miljø (7 min)</i>
	Fra nye enzymer til verdiskapning – II <i>Lasse Fredriksen, postdoktor, NMBU (7 min)</i>
	Samarbeidet mellom industri og akademia: noen historier fra virkeligheten <i>Kjartan Sandnes, CSO, Biomega Group AS (7 min)</i>
	Hva har Norge fått ut av NorZymeD (og hvorfor?) <i>Vincent Eijsink, professor og prosjektleder for NorZymeD, NMBU (15 min)</i>
11:10 - 11:30	Tema: Bioteknologiens samfunnsnytte i Norge <i>Ole Jørgen Marvik, spesialrådgiver, Innovasjon Norge</i>

<https://norzymed.nmbu.no/> Påmelding; <https://form.nmbu.no/view.php?id=288763>



11:30 - 12:30	Lunsj
12:30 - 12:50	Tema: Kunnskapsbasert verdiskapning - grønn utvikling og bioteknologiens rolle. <i>Roald Gulbrandsen, regionsjef, NHO Østfold</i>
12:50 - 13:50	Strategisk næringsrettet bioteknologi Paneldebatt <i>Innledning ved Ragnhild Solheim, direktør for forskning, innovasjon og eksternt samarbeid, NMBU</i>
	PANELET; <ul style="list-style-type: none">• Gisle Løhre Johansen, direktør forretningsutvikling og FoU, Borregaard.• Kjartan Sandnes, CSO, Biomega Group AS• Roald Gulbrandsen, regionsjef, NHO Østfold• Roger Strand, professor, UiB• Ågot Aakra, dekan KBM, NMBU
13:50 - 14:15	Konklusjon/oppsummering, <i>Jacob Wang, spesialrådgiver, Norges Forskningsråd og Ole Jørgen Marvik, spesialrådgiver, Innovasjon Norge og styreleder i NorZymeD</i>
14:15	Møteslutt

<https://norzymed.nmbu.no/> Påmelding; <https://form.nmbu.no/view.php?id=288763>



Contact:

Projectleader; Professor Vincent Eijsink,
vincent.eijsink@nmbu.no