

"SYNTHESIS AND CHARACTERIZATION OF PEPTIDE-ALGINATE"

Master thesis in chemistry at NovaMatrix in Sandvika

Who are we?



NovaMatrix is one of the worlds leading producers and suppliers of ultra-pure biopolymers (alginate, chitosan and hyaluronic acid) for use in pharmaceutical, biotechnological and biomedical applications. In addition, we have strong focus on research and technology developments based on our products. We develop and patent technologies in areas like gene-therapy, cell-therapy, tissue engineering and more.

Our new facility in Sandvika is modern and well equipped, and houses approximately 20 people from NovaMatrix, as well as 10 people from our parent company, FMC Biopolymer AS. Our activities are spread across two floors, with offices on the second floor, and production/laboratories on the third. The building is situated in walking distance from the railway station in Sandvika (9 minutes).



NovaMatrix have a highly technological work environment, with good access to relevant instrumentation. In addition we are very proud of our friendly and social milieu.

You can find more information about NovaMatrix on our webpage: <http://www.novamatrix.biz/>

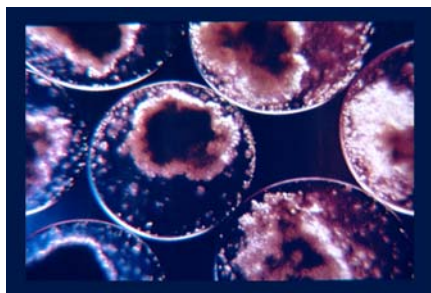
What's the background for the thesis?

Background: Alginate is a polysaccharide extracted from brown seaweed and kelp. Its main function is to contribute to the strength and flexibility of the plant. Alginates are today used in ice creams, sauces, baked products, fish feed and in pharmaceutical compositions.

Alginates manufactured by NovaMatrix have much higher purity than required by the above examples, and consequently, also have much higher value. Our alginates are intended for use



together with living cells and/or living tissue, and for implantation into humans.



Alginate can be used to encapsulate living cells, to give protection against immune responses, and to give cells a three dimensional network to grow in. NovaMatrix has in-licensed a patent on alginates with covalently bonded peptides. Special peptides are known in biology to function as signal sequences that cells recognize and attaches to. Cells growing in peptide-coupled alginate can attach better to the gel network, thrive, proliferate and function better.

NovaMatrix is commercializing peptide-alginates by licensing the technology to different applications. This makes it both important and interesting to be able to characterize the peptide alginates on a molecular level.

What's the content of thesis work?

The thesis work will consist of both synthesis and characterization of peptide-alginates. Characterization of the peptides will be done mainly with NMR techniques, and the goal of the synthesis will be to prepare material especially well-suited for such characterization.

Our own production department will start commercial production of peptide-alginates end of this year, and the student will be given both training and the opportunity to benefit from the knowledge gained by the production department. Initially, one will couple small peptides to well-defined and homologous alginate oligomers. Once these model systems are understood the synthesis will move over to polymer level.



The NMR part of the thesis will be to study:

- Degree of substitution
- The binding point of the peptide
- Stability of the peptide-alginate
- Biprodukt, if any.
- Yields
- And more.

The primary characterization of peptide-alginates will be by NMR techniques. However, the student will also have the opportunity to learn other analytical methods, for example chromatography, light scattering, rheology and more.

What can we offer?

We can offer a master thesis in a biotechnological and hi-tech work environment, with good access to relevant instrumentation. We seek a person with background from synthesis and NMR-characterization, who can benefit from existing competence both at the University of Oslo, and NovaMatrix. Interest in biology and biotechnology is an advantage.

Still interested or questions about the thesis? Don't hesitate to contact us!

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