



# Industrial Enzymes

## Manufacturing, stability and detection

November 24 - 26, 2021

Online course

Now as  
online course

### Outcome

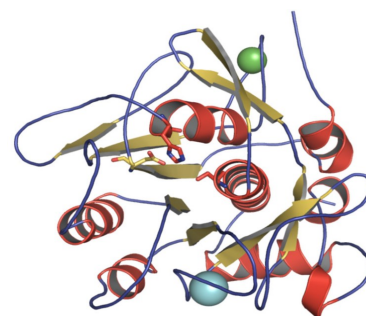
Through presentations, exercises and plenary discussions participants will acquire solid knowledge of enzyme activity, structure and function as well as understanding of the industrial manufacturing of enzymes, from expression and fermentation to recovery and formulation. The course enables participants to better understand enzymes and enzyme product stability, thereby enabling the participants to utilise enzymes in the optimal way in their own applications and processes.



### Main subjects taught at the course

(see also last pages of flyer for the detailed program)

- What is an enzyme?
- Understanding enzymes - activity, structure and stability
- Enzyme classification
- Expression hosts used for industrial production of enzymes
- Fermentation and recovery
- Enzyme formulation
- Product stability
- Enzyme screening and detection
- Enzyme application - a case study



### Target group

The course addresses chemical engineers, technicians, product and process engineers as well as all others working with enzyme products, e.g. in the food, feed, detergent industry, who would like to understand the fundamentals of enzymes as well as the manufacturing process, product stability and enzyme detection in their own applications.



### Form

The online course runs for three consecutive days with alternating presentations, exercises and plenum discussions. All course material is available for download in advance of the course.

The course is held online via an online conference tool in real-time allowing questions and discussions to be facilitated in real-time.

There will be sufficient amount of breaks and time to ask questions in between the different sessions.



**Registration and further information: Please see the next pages**

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### Teachers

**Peter Dybdahl Hede, M.Sc. (Chem. Eng.), Ph.D.**



- VP R&D in industrial biotech. +10 years of industrial enzyme experience
- Teaching experience from The Danish Society of Engineers, Technical University of Denmark and numerous training courses in various engineering disciplines
- Co-founder of seydlitz.dk
- Contact: pthd@seydlitz.dk

**Pernille Ollendorff Hede, M.Sc. (Biochem.), Ph.D.**



- 10 years experience within industrial Enzyme Engineering
- Teaching experience from the University of Copenhagen and numerous training courses in Industrial Biotechnology
- Master of science in Biochemistry, Ph.D.
- Contact: pohe@seydlitz.dk

### Guest speakers:



### Fee

The course fee is payable in advance either via direct deposit (details included in the invoice) or via credit card payment available upon online registration at our homepage.

The course fee includes all course presentations, calculation exercises and solutions, selected scientific papers as well as course diploma (all in PDF format).

All course material is available for download well in advance of the course.

Per delegate EUR 1975,- plus VAT. VAT is reclaimable.

### Registration

Binding registration at [www.seydlitz.dk](http://www.seydlitz.dk) under "Courses" no later than November 1<sup>st</sup> 2021. In case of any questions please contact [info@seydlitz.dk](mailto:info@seydlitz.dk) or phone +45 30 79 03 36.

The course may be subject to cancellation in case of too few participants

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### Course contents

Day 1:	Subject
10.00 - 10.15	<u>Course introduction</u>
10.15 - 12.00	<u>Understanding enzymes</u> Definition of an enzyme Activation energy Specificity and activity Structure and stability Cofactors
12.00 - 13.00	Lunch break
13.00 - 14.30	<u>Enzyme kinetics</u> Enzymatic reaction rate Michaelis–Menten kinetics Single-substrate reactions
14.30 - 16.00	<u>Enzyme classification</u> Enzyme classes and families What enzyme classes are used industrially?



**CET time zone**

Day 2:	Subject
9.00 – 10.30	<u>Industrial production of enzymes</u> Using single cells as small protein factories Fungal expression Bacterial expression Safety and Regulatory
10.30 – 12.00	<u>Fermentation and recovery</u> Cultivation of enzymes Recovery of enzymes Granulation of enzymes Sampling, sensor technology and data analysis
12.00 – 13.00	Lunch break
13.00 – 14.30	<u>Enzyme formulation</u> Solid product formulation Liquid product formulation
14.30 – 16.00	<u>Product stability</u> Per se and in application enzyme stability Real time stability studies Modelling Examples of application studies focussing on stability



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### Course contents - continued

Day 3:	Subject
9.00 – 10.30	<u>Enzymatic activity</u> Activity screening Enzyme detection
10.30 – 12.00	<u>Enzyme analysis</u> New enzyme assay technologies for industrial use Guest Speaker from GlycoSpot
12.00 – 13.00	Lunch break
13.00 – 14.00	<u>Enzyme application - a case story</u> Guest speaker from Tailorzyme
14.00 – 15.45	<u>Enzyme application - Case study from the Detergent industry</u>
15.45 – 16.00	Final remarks and wrap-up

**CET time zone**

GlycoSpot

Tailorzyme  
CUSTOMIZED ENZYME SOLUTIONS

**Please see all of our courses at:**

**[www.seydlitz.dk/courses](http://www.seydlitz.dk/courses)**