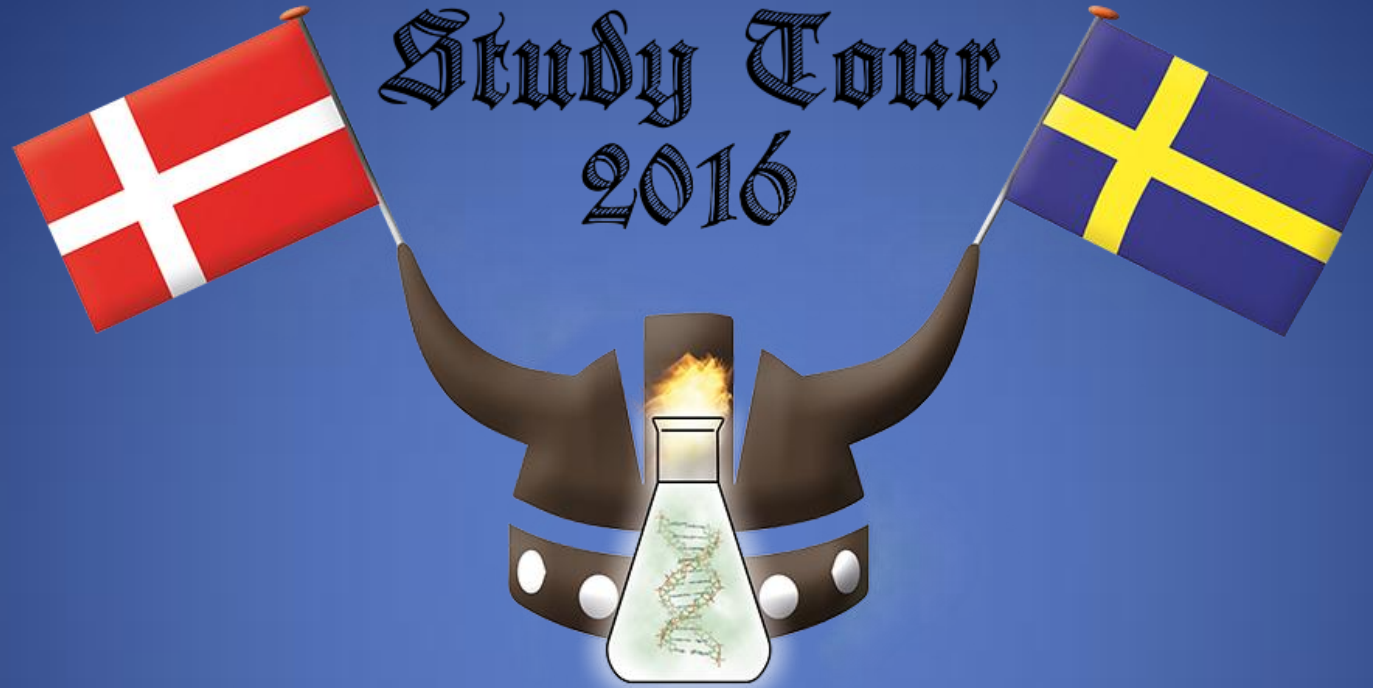


**Symposium**

**10 March 2016**

# Today's symposium

- Talks students
- Talk Lianne - (student)life in Denmark
- Announcement program
- Hap-and-stap list (your help)
- Closing/drinks

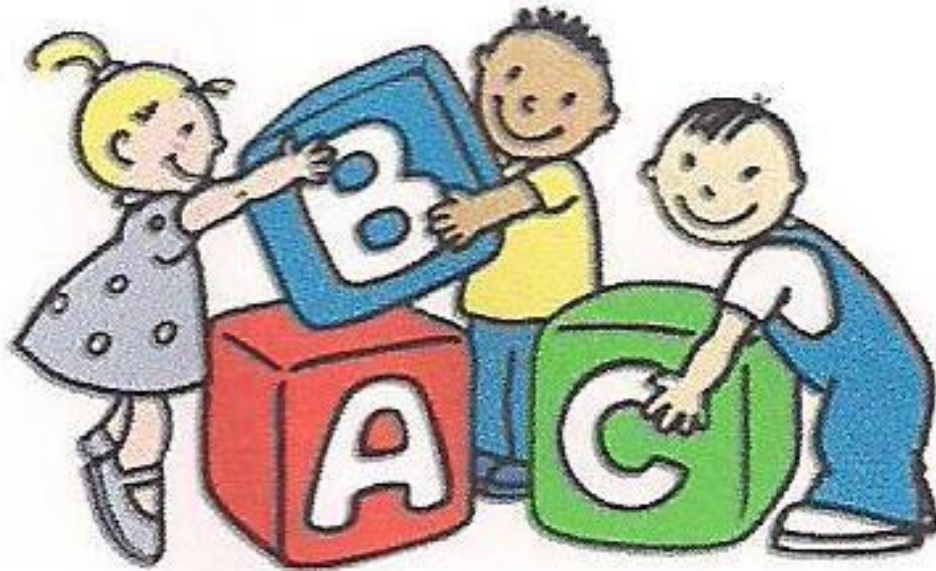


# Symposium

10 March 2016

# The educational systems of Sweden and Denmark

# Pre-school: Childcare – förskola – børnehaver



# Pre-school year: förskoleklass – børnehaverklasser

- Sweden and Denmark: special pre-school year



# Middle education: The Netherlands

- **Primary school**
  - Age 4 - 12
  - All same education
- **Secondary school**
  - 4 to 6 years
  - Lower and upper secondary school
  - Different levels of education
  - Choice in direction: social sciences or natural sciences
  - All compulsory

# Middle education: Denmark

- **Folkeskole** (people's school)
  - Age 6 - 16
  - Primary and lower secondary education
  - Comparable to Dutch system
  - Compulsory
  
- **Ungdomsuddannelse** (youth education)
  - 2 to 4 years
  - Upper secondary education
  - Academically or practically orientated
  - Choice in direction



# Middle education: Denmark

- **Grundskola** (elementary school)
  - Age 6 – 16
  - Only small choices for courses
  - All same level
  - Compulsory
- **Gymnasieskola** (secondary school)
  - 3 years
  - 18 national programmes: 12 vocational, 6 preparatory for higher education
  - fifteen weeks of workplace training

# Grading systems

	Dutch	Danish	Swedish
Excellent	9/10	12	A
Very good	8	10	B
Good	7	7	C
Fair	6	4	D
Adequate	5.5	02	E
Inadequate	3/5.5	00	F
Unacceptable	0/3	-3	F

# Higher education

Qualified vocational education



# Higher education

University colleges



# Higher education

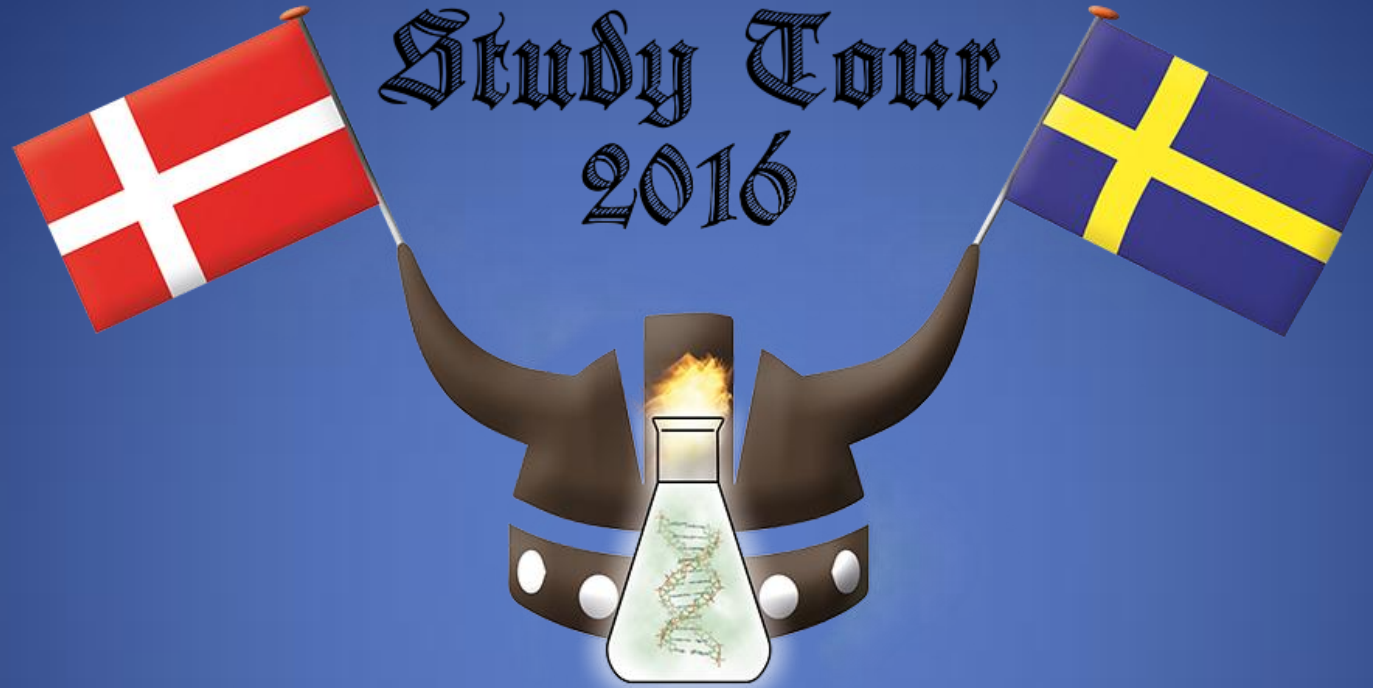
## Universities



# Nations

Sweden: Uppsala & Lund  
Oldest student societies  
Different provinces





# Symposium

10 March 2016

# Universities of Lund and Copenhagen

Dana te Brinke  
10 March 2016





# Lund University

- Founded in 1666
- 42000 students (*Radboud: 20000 students*)
- 60th in QS World University Rankings (2014)
- Satellite campuses in Malmö, Helsingborg and Ljungbyhed



University main building, 1882

Kungshuset (Department of Philosophy), 1584



# Lund University: Faculties

- Faculty of Engineering
- Faculty of Fine and Performing Arts
- Faculties of Humanities and Theology
- Faculty of Law
- Faculty of Medicine
- Faculty of Science
- Faculty of Social Sciences
- School of Economics and Management

# Lund University: Faculty of Science

## 14 Bachelor's programmes

- Astronomy and astrophysics
- Biology
- Physics (in English)
- Geology
- Chemistry
- Chemistry/molecular biology
- Chemistry/physics
- Mathematics (in English)
- Meteorology and biogeophysics
- Environmental and health protection
- Environmental science
- Molecular biology
- Physical geography and ecosystem analysis (in English)
- Theoretical physics

## 20 Master's programmes



# Lund University: Faculty of Science

## Research departments

- Centre for Environmental and Climate research
- Centre for Mathematical Sciences
- Department of Astronomy and Theoretical Physics
- Department of Biology
- Department of Chemistry
- Department of Geology
- Department of Physical Geography and Ecosystem Science
- Department of Physics
- MAX-Faculty of Science
- Radiation Physics

# Lund University: Department of Chemistry

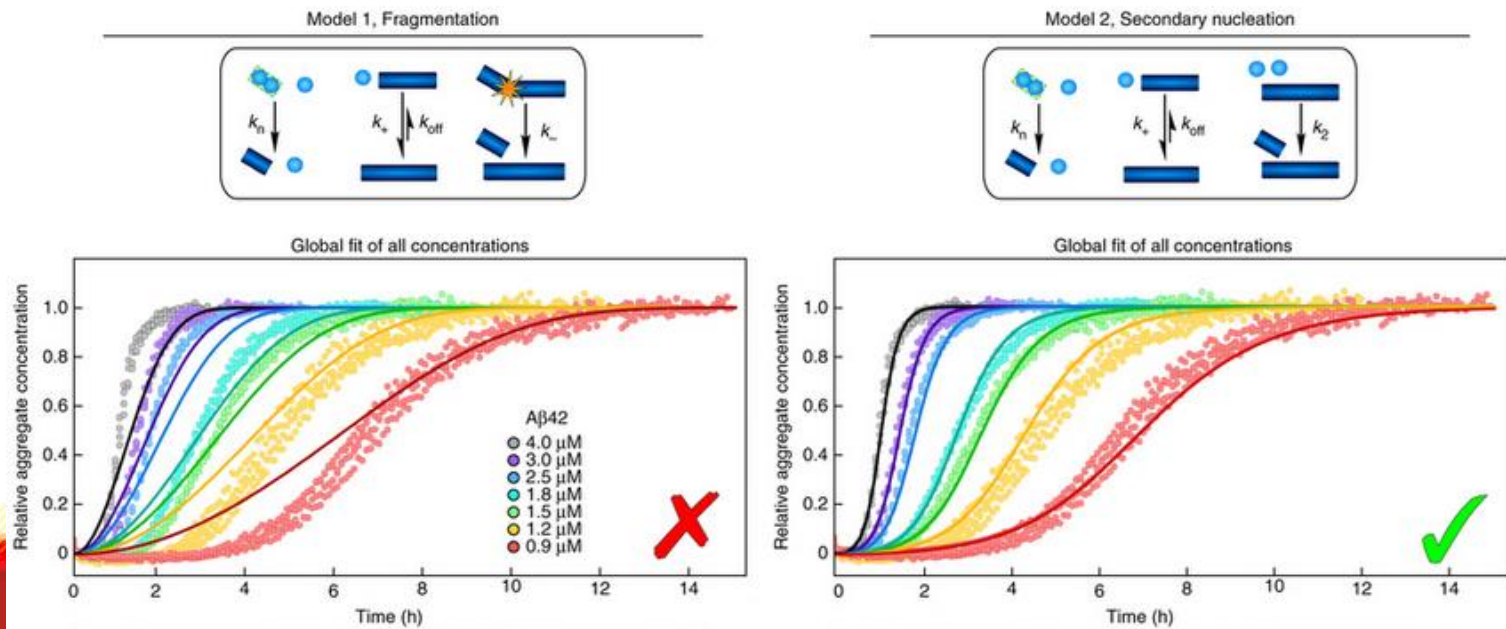
Center for Molecular Protein Science

## Molecular mechanisms of protein aggregation from global fitting of kinetic models.

Author: Georg Meisl, Julius B Kirkegaard, Paolo Arosio, Thomas C T Michaels, Michele Vendruscolo, Christopher M Dobson, Sara Linse, Tuomas P J Knowles

Journal: *Nature Protocols*, Volume 11, Issue 2, Page 252, to 272

Year: 2016



## Lund University: research facilities

### MAX IV Laboratory

- Open in summer 2016
- Electron accelerator laboratory
- World's leading synchrotron radiation facility



### European Spallation Source (ESS)

- Open in 2019
- World's most powerful neutron source

# Lund University: other facilities



8

University Library



2

Historical Museum



9

Museum of the Artistic Process and Public Art



6

Botanical Gardens

## Lund student life

- 83000 inhabitants – 42000 students
- International environment
- 13 student nations





# University of Copenhagen

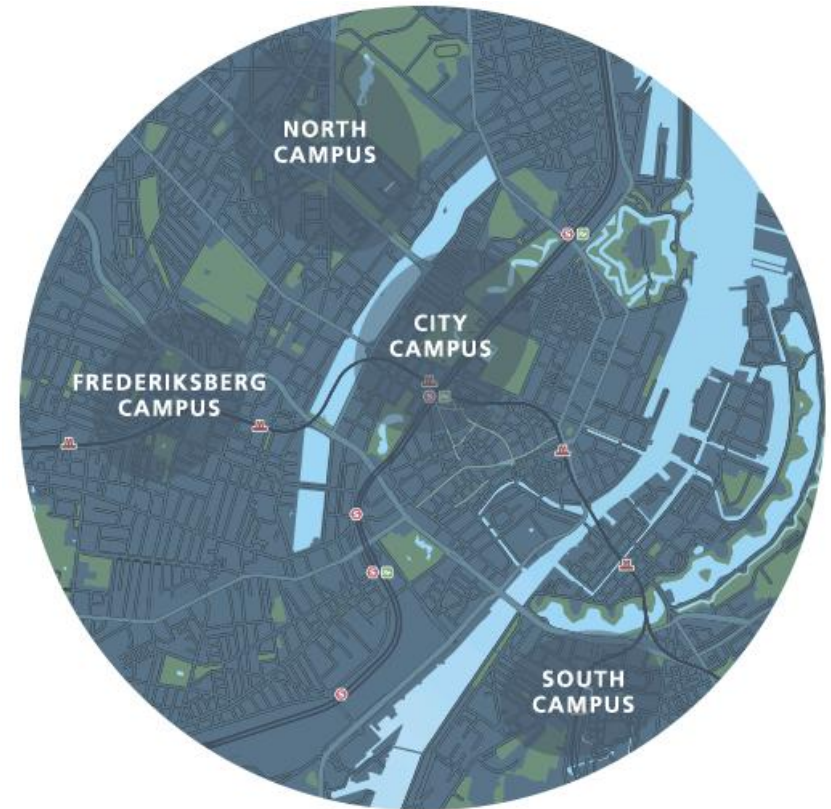


# University of Copenhagen

- Founded in 1479
- 41000 students
- 45th in QS World University Rankings (2014)
- Four campus areas



University main building



# University of Copenhagen: Faculties

- Faculty of Health and Medical Sciences
- Faculty of Humanities
- Faculty of Law
- Faculty of Science
- Faculty of Social Sciences
- Faculty of Theology

# University of Copenhagen: Faculty of Science

9500 of 41000 students

21 Bachelor's programmes:

- Biochemistry
- Biology
- Biology-biotechnology
- Computer science
- Actuarial mathematics
- Physics
- Food and nutrition
- Geography and geoinformatics
- Geology-geoscience
- Garden and park engineering
- Animal science
- Physical education
- Agricultural economics
- Chemistry
- Landscape architecture
- Mathematics
- Mathematics-economics
- Molecular biomedicine
- Nanoscience
- Natural resources
- Forest and landscape engineering

35 Master's programmes

# University of Copenhagen: Faculty of Science

Research departments:

- Department of biology
- Department of computer science
- Department of food and resource economics
- Department of food science
- Department of geosciences and natural resource management
- Department of nutrition, exercise and sports
- Department of mathematical sciences
- Department of science education
- Department of plant and environmental sciences
- Department of chemistry
- Niels Bohr institute
- Natural history museum of Denmark

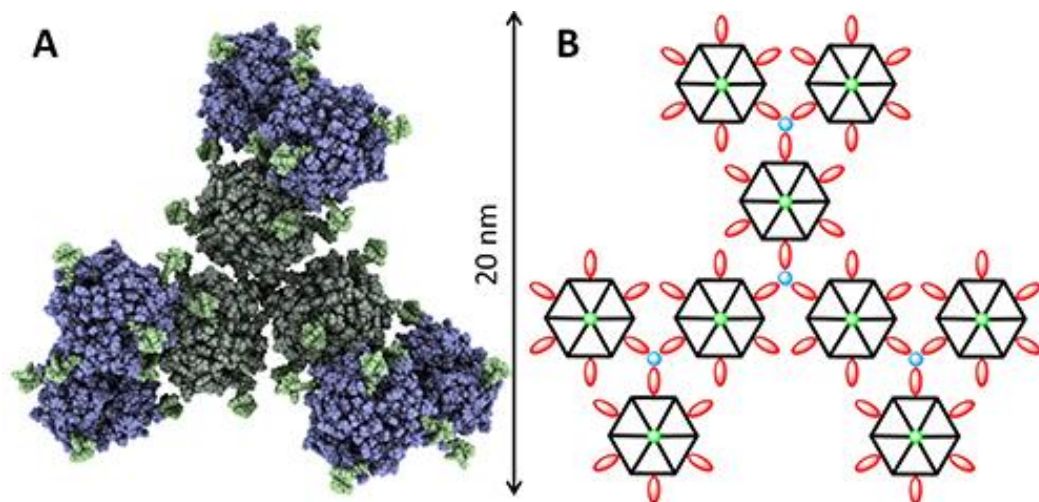
# University of Copenhagen: Department of Chemistry

## Construction of Insulin 18-mer Nanoassemblies Driven by Coordination to Iron (II) and Zinc (II) Ions at Distinct Sites

Author: Knud J Jensen *et al.*

Journal: *Angewandte Chemie International Edition*, Volume 55, Issue 7

Year: 2016



## University of Copenhagen: other facilities



Botanical Garden



Medical Museion



Geological Museum



Museum of Herbal Medicine

# Copenhagen student life

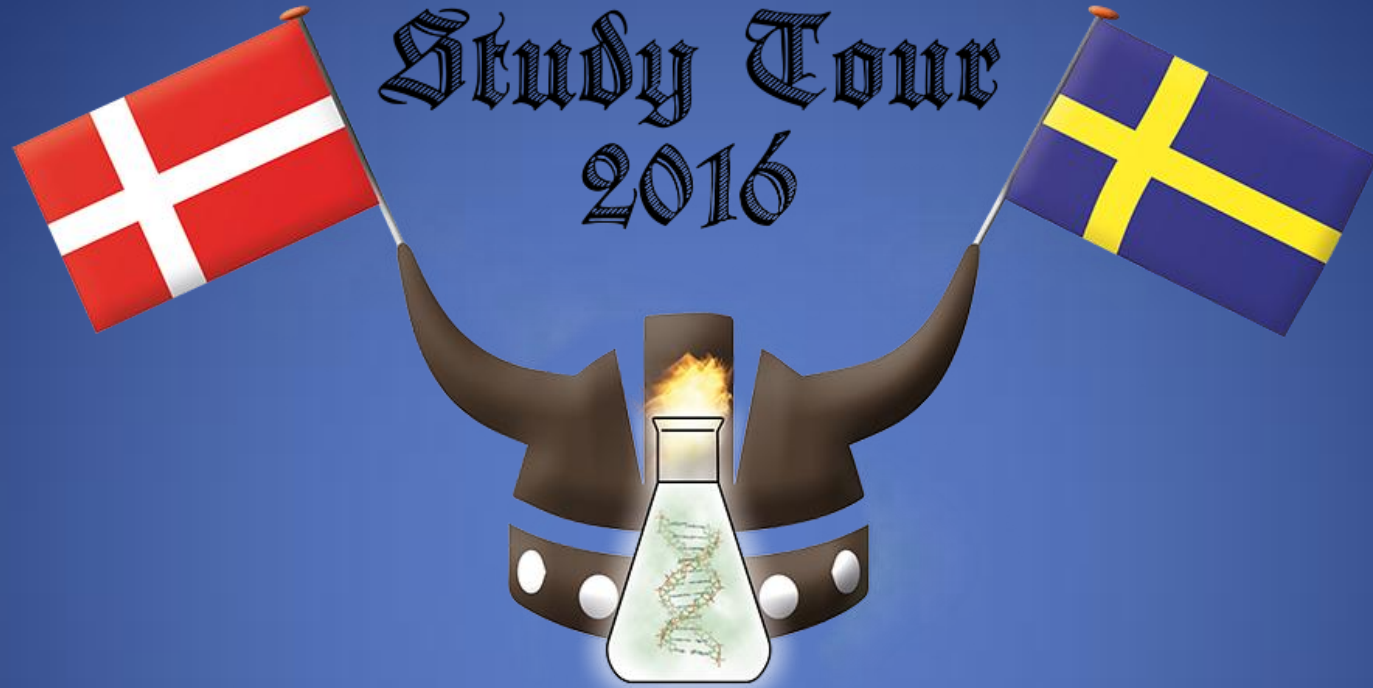
- Cultural city
- Friday bar
- International atmosphere





# Questions





# Symposium

10 March 2016

# The history and international relationships of Sweden and Denmark

Roel Maas

# History of Sweden

- Viking era (800-1050)
  - First Russian states
  - Many small chiefdoms
- Magnus Ladulås
  - Feudal system
- Kalmar Union
  - Stockholm Bloodbath
  - Gustav Vasa
  - 1523
  - Foundation of Swedish empire



# History of Sweden

- One of the strongest empires in Europe
  - Great Northern War (1700)
- 18<sup>th</sup> / 19<sup>th</sup> century
  - Power in the hand of the parliament
  - Cultural development
  - Napoleonic Wars
  - Loss of Finland to Russia
- Industrial Revolution
  - Agriculture → Industry



# History of Sweden

- Neutrality
  - Welfare state
- United Nation
- European Union (1995)



# History of Denmark

- Vikings era
  - Westward
  - Normandy and England
  - United Denmark in 965
  - Harald Bluetooth
    - Christianity
    - Jelling stones
- Valdemar (1132)
  - Feudal System
  - Constitution



# History of Denmark

- Loss of power to the nobleman
  - Eight years without a king
    - Assassination
    - Valdemar (1360)
- Kalmar Union
  - Norway and Denmark
- Reformation of Denmark
  - Hans Tausen (Lutheran)
  - Count's Feud





# History of Denmark

- 16<sup>th</sup> century
  - Control over the Baltic Sea
  - Taxes for trade
  - Thirty Years War
- Northern Wars
  - Defeat against Sweden and The Netherlands
  - Treaty of Copenhagen
  - Sweden's defeat
  - Peace
    - Healthy economy

# History of Denmark

- **Napoleonic Wars**
  - Loss of Norway to Sweden
  - Constitutional monarchy
    - Folketing
    - Landsting
- **First World War**
  - Forced export into Germany
  - Loss of Iceland
  - Social-democrats
    - Welfare state



# History of Denmark

- Second World War
  - Neutrality
  - Occupation by Germany
    - Protection of the population
    - 5<sup>th</sup> of may
    - Smuggling of Jews to Sweden
- United Nations
- NATO
- European Union



# International relationships of Sweden and Denmark

- Kalmar Union
- Eleven Wars
- Monetary Union



# International relationships of Sweden

- Neutrality
- United States
  - Colonies
  - 1,3 million Swedes emigrated
  - Vietnam War
- Russia
  - Vikings
  - High tension



# International relationships of Sweden

- The Netherlands
  - 400 years of diplomacy
  - One of Sweden's main investors
    - Chemical sector
  - Export of chemicals

# International relationships of Denmark

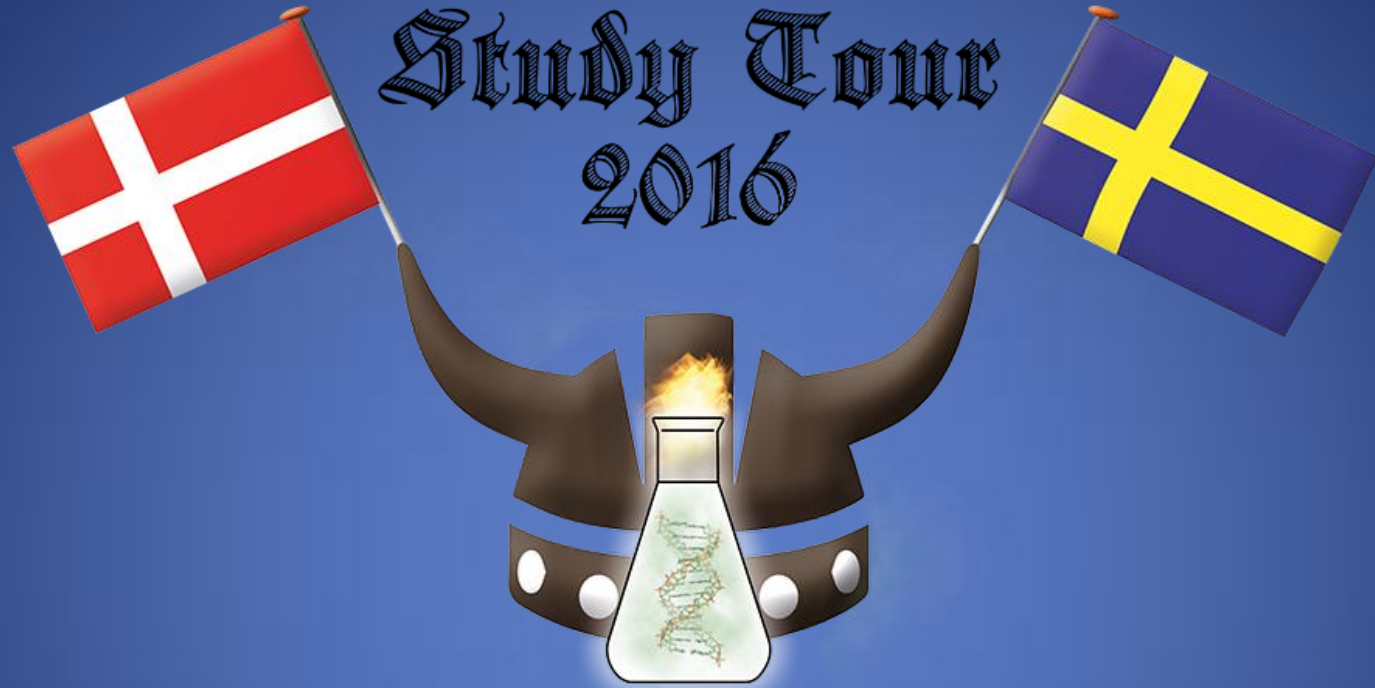
- Active Foreign Policy
- Greenland and the Faroe Islands
- International disputes
  - Hans Island
  - Danish-Polish border in the Baltic Sea
  - North pole
- Colonies in India and Africa
- Iceland

# International relationships of Denmark

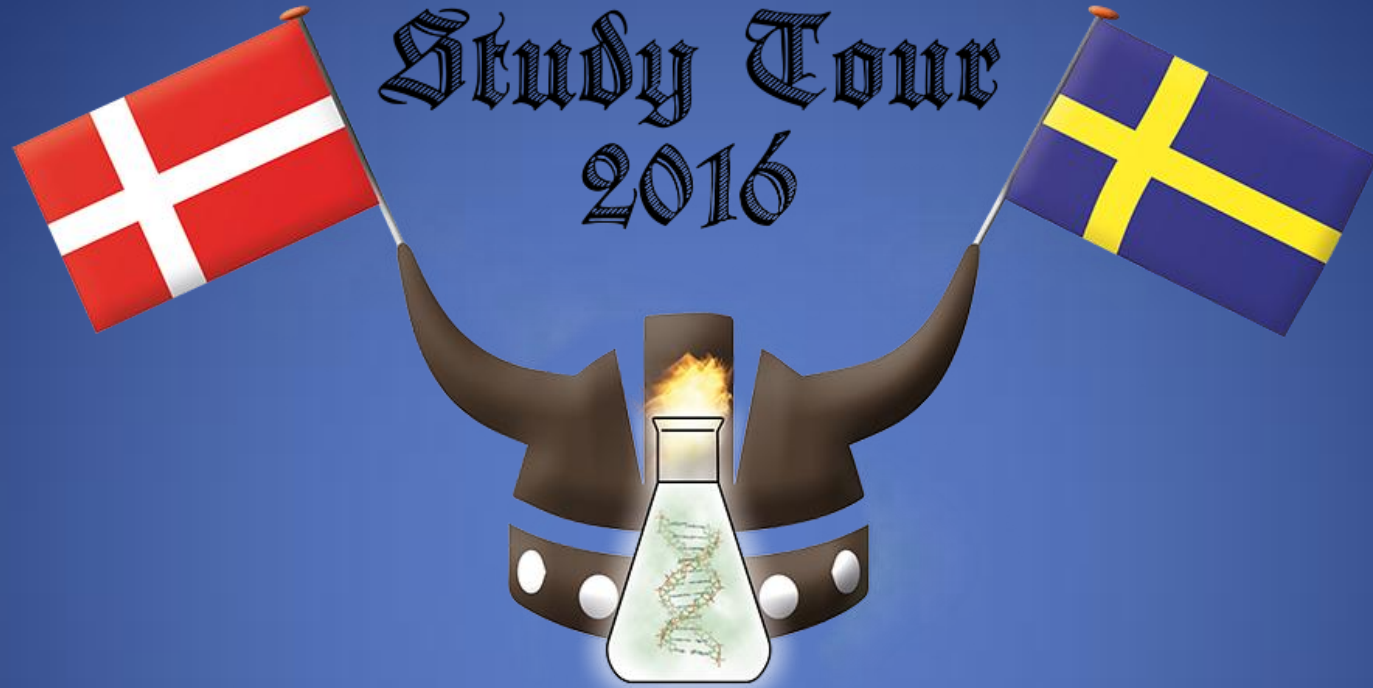
- The Netherlands
  - 16<sup>th</sup> and 17<sup>th</sup> century
  - Import and export of chemicals







**Break**



# Symposium

10 March 2016

# Universities of Uppsala and Stockholm

Study tour chemistry 2016

Alain André



UPPSALA  
UNIVERSITET



Stockholm  
University

# Universities of Uppsala and Stockholm

- History
- General information
- Faculties & natural science departments



# University of Uppsala – History



**1477** – Pope Sixtus IV gave the rights to the university

**17<sup>th</sup> century** – King Gustavus Adolphus of Sweden

**1620** number of professors form 8 to 13

**1621** total number of professors to 17

Queen Christina of Sweden:

scholarships to study abroad



Pope Sixtus IV



# University of Uppsala – History



18<sup>th</sup> century – important names

**1728** Klingenstierna (1728  
Mathematics, 1750 Physics)

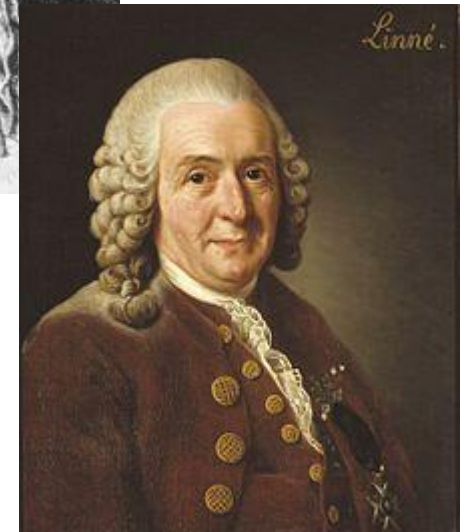
**1729** Anders Celsius (Astronomy)

**1741** Carl Linnaeus (Medicine)

**1786** Gustavus III donated baroque  
gardens



**1893** A. Nobel honorary doctorate



# University of Uppsala – History



19<sup>th</sup> century

**1870** secondary school for girls

**1873** girls allowed at the university  
(except for Theology and Law)

**1872** Betty Petterson

**1883** Ellen Fries

**1894** Astrid Cleve



# University of Uppsala – General

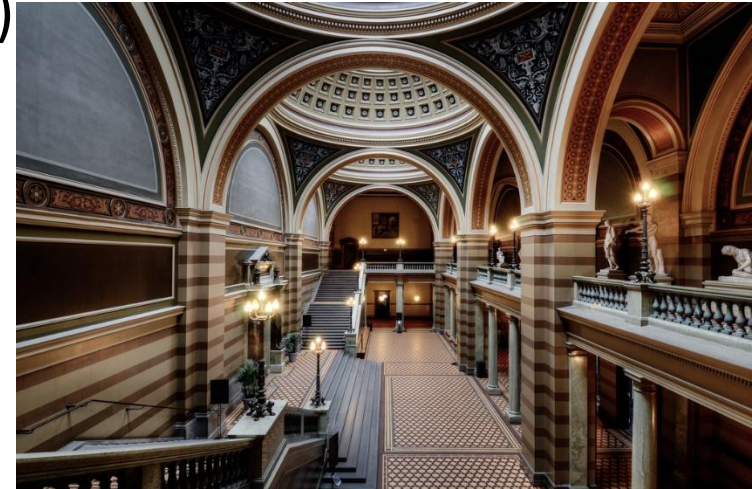


Ranked 81 (2015)

3 disciplines:

1. Humanities and Social Sciences (6 faculties)
2. Medicine and Pharmacy (2 faculties)
3. Science and Technology (1 faculty)

[https://www.youtube.com/watch?v=sz\\_168kko2k](https://www.youtube.com/watch?v=sz_168kko2k)



## Research Areas

Uppsala University takes on future challenges. The breadth of research gives strength and opportunities. At Uppsala University, research is being conducted which helps us better understand our society, making the world better and life simpler for many people – research that provides new perspectives on fundamental scientific issues and contributes to sustainability, human health and the development of society.



# University of Uppsala – Chemistry



## SECTION OF CHEMISTRY

The Section of Chemistry consists of two departments at two campuses; the Ångström Laboratory and the Biomedical Centre (BMC). Research at the **Department of Chemistry - BMC** focuses more on the life sciences and at the **Department of Chemistry - Ångström Laboratory** more on materials and energy.

# University of Uppsala – Chemistry



- Organic Chemistry
- Analytical Chemistry
- Biochemistry

- Physical Chemistry
- Molecular biomimetics
- Inorganic Chemistry
- Polymer Chemistry
- Structural Chemistry
- Theoretical Chemistry



**Biomedical Centre**



**Ångström laboratory**

# Stockholm University - History



*Alternative to traditional universities*

→ *Openness, accessibility, active role in society*

**1878** founded, first public lectures

**1889** Sonja Kovalevsky first female professor mathematics

**1904** SU has the right to award degrees

(because of shortage lawyers)

**1907-1960** students increased from 300 to 8000

**1960** becomes university

**Today** Sweden's largest university

<https://www.youtube.com/watch?v=br1BxW7YteY>



# Stockholm University - General



**#136**

**70,000** students → 13% science

**1800** doctoral students

**5000** staff members

Participation Nobel prize committees

**28%** Professors is female,

**50%** Associate Professors is female



# Stockholm University – Nobel Prises



1995 Paul Crutzen

research on the formation and decomposition of ozone in the atmosphere



1943 George de Hevesy

method of using isotopes to trace chemical reactions and processes in the body

1929 Hans von Euler-Chelpin

Fermentation of sugar and the enzymes involved in complex reactions



1903 Svante Arrhenius

discovery on how chemical compounds can carry electric current



$$k = Ae^{-E_a/(RT)}$$

# Stockholm University - Chemistry



**Chemistry** (around 500 researchers/teachers)

- Biochemistry & Biophysics
- Neurochemistry
- Organic Chemistry
- Material & Environmental Chemistry

**Shanghai list** – *top 50 in the world list, 10 in Europe*

- Wenner-Gren Institute – Molecular bioscience

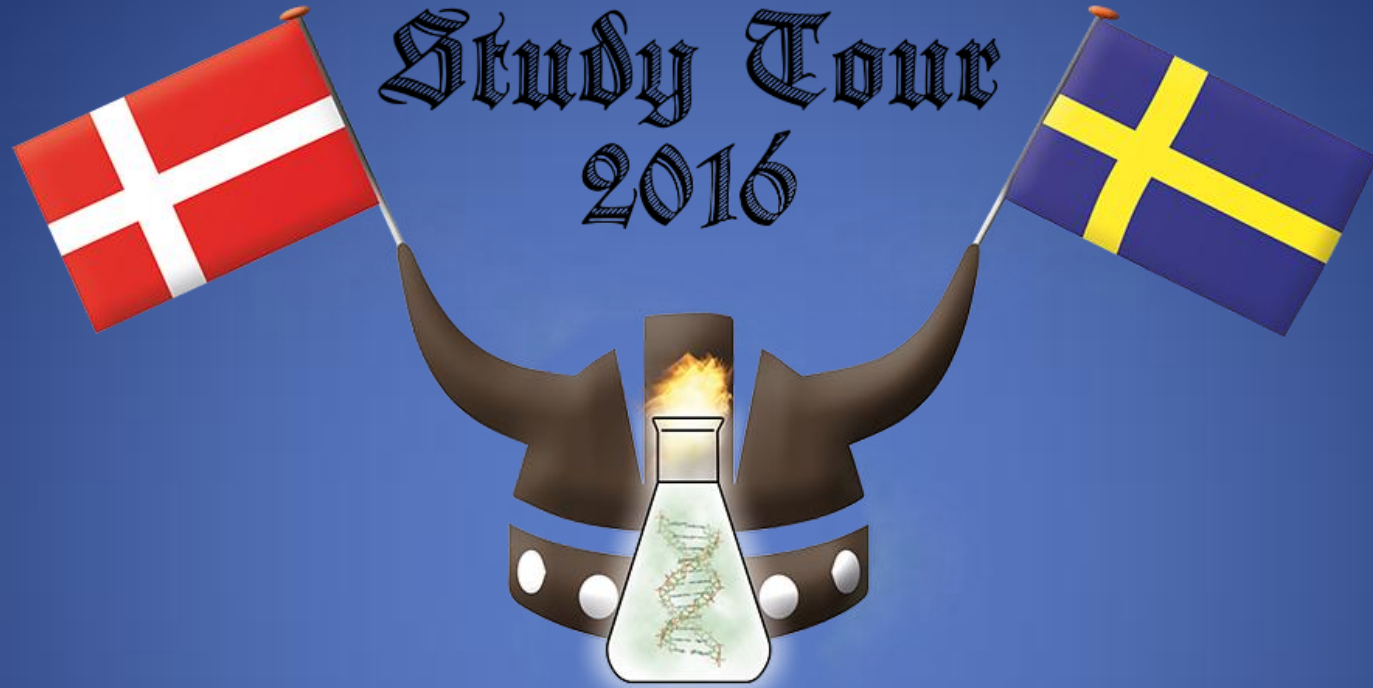
Department of  
Molecular Biosciences,  
The Wenner-Gren Institute



Thank  
You

**Sources:**

- University of Uppsala:  
<http://www.uu.se/en>  
<http://www.kemi.uu.se/about-us/>
- Stockholm University:  
<http://www.su.se/english/>
- Wikipedia
- *University of Otago*
- YouTube

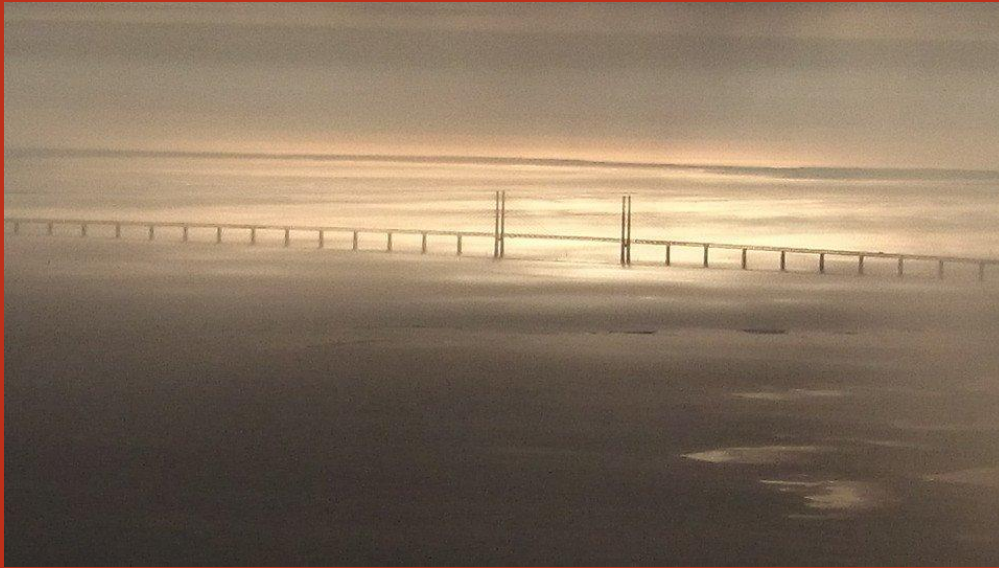


# Symposium

10 March 2016



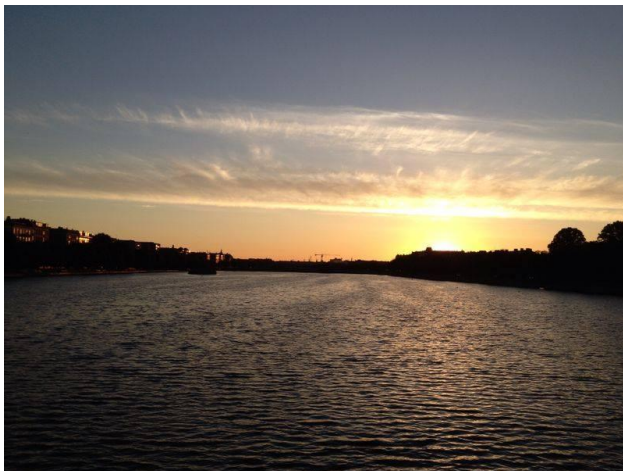
# Praktik i København



Lianne Lelieveldt  
10 maart 2016  
Studytrip Sweden and Denmark

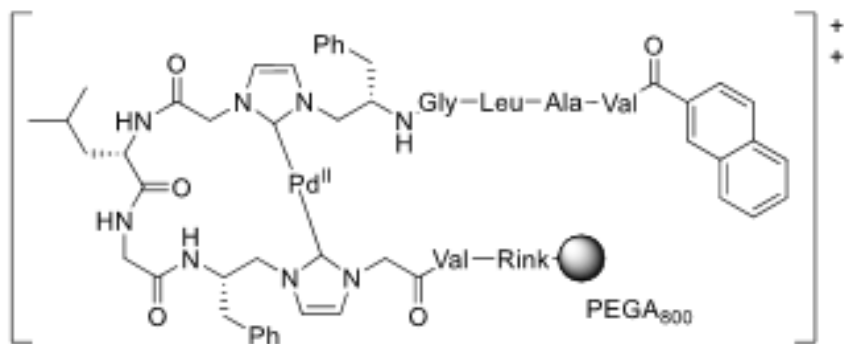
## Final masters internship

- Project needs to be interesting
  - In bio-organic chemistry
- I wanted to go abroad
  - Rather a place where also something happens
- How to find the right lab?
  - Ask people who have contact with foreign labs



## Final masters internship

- I got in contact with Prof Morten Meldal
  - Very much known for the CuAAC reaction
- Choice for a few projects
  - Mimicking of metalloproteases

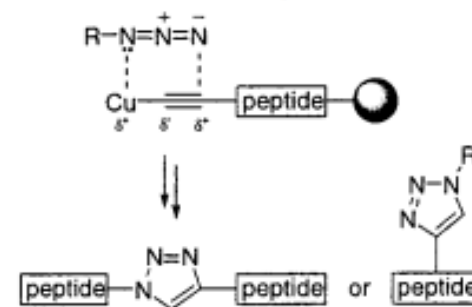


J.F. Jensen, K. Worm-Leonhard, M. Meldal *Eur. J. Org. Chem.* **2008** 3785-3797.



*J. Org. Chem.*, Vol. 67, No. 9, 2002

### Scheme 1. Copper(I)-Catalyzed 1,3-Dipolar Cycloaddition of Alkynes to Azides Affording Peptidotriazoles or *N*-Substituted Histidine Analogs



Tornøe, C. W.; Christensen, C.; Meldal, M. *J. Org. Chem.* **2002**, 67, 3057.



Rostovtsev, V. V.; Green, L. G.; Fokin, V. V.; Sharpless, B. K. *Angew. Chem., Int. Ed.* **2002**, 41, 2596



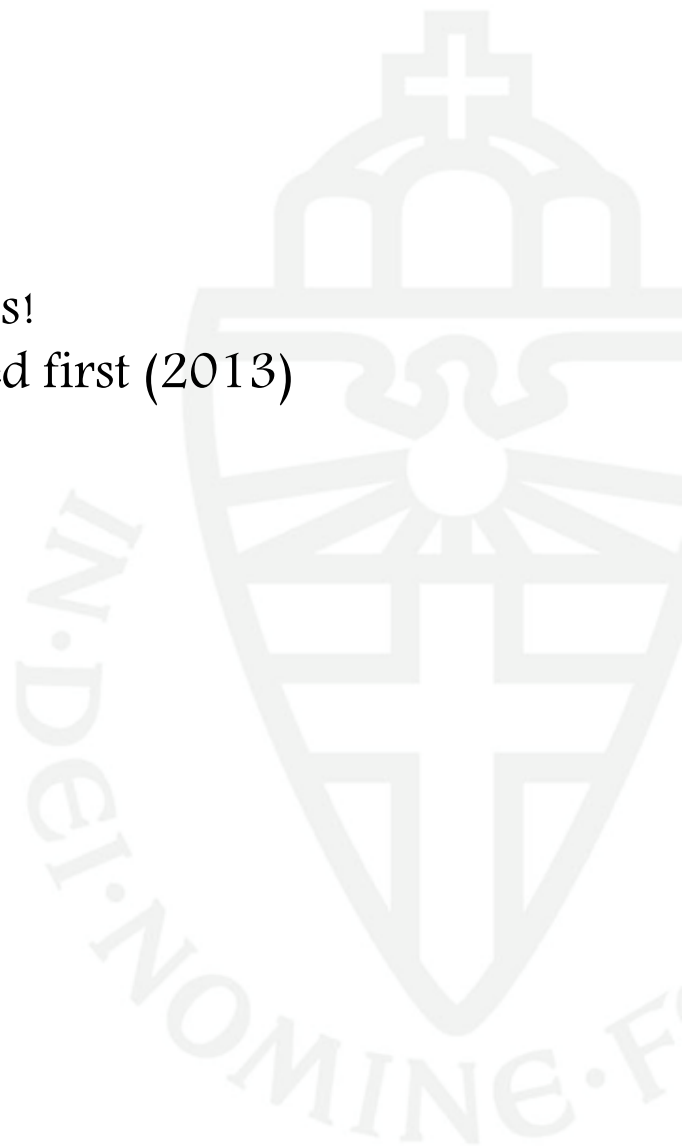
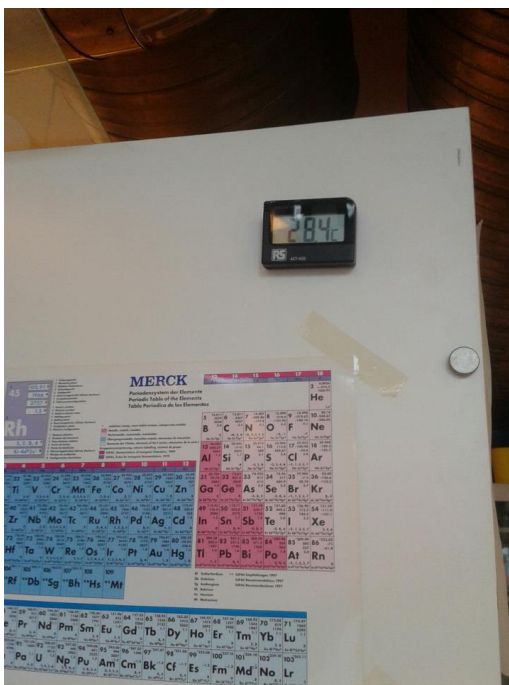
## What to do before you can go abroad?

- Make sure you have a clear confirmation
- Get approval by RU and an internal supervisor
- Apply for travel grants (eg Erasmus)
- Housing
- The trip itself

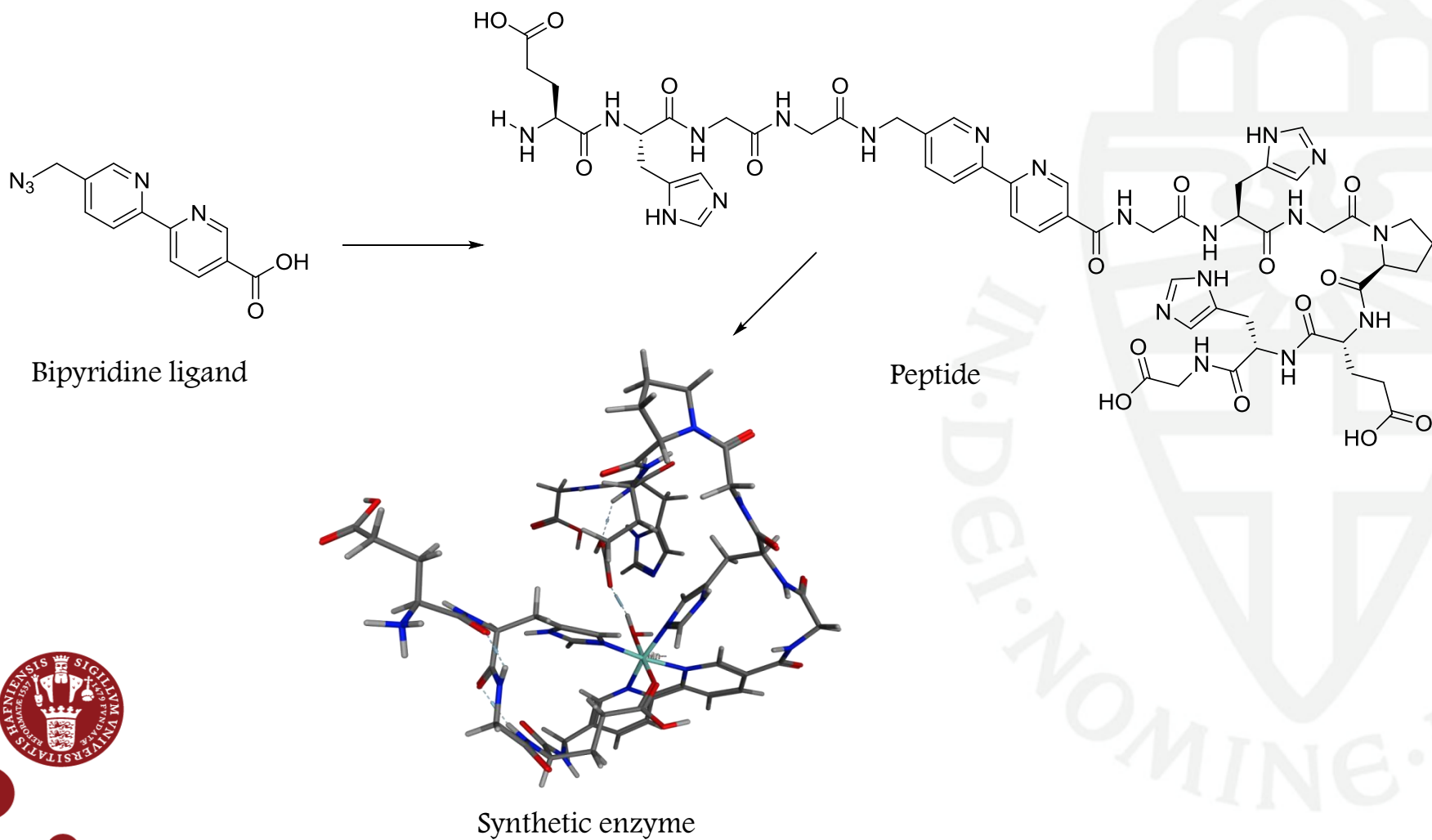


## My first impression

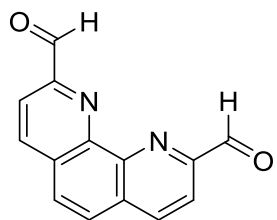
- We are definitely spoiled having these RU labs!
- The group was not a group yet when I arrived first (2013)
- Therefore supervision was different



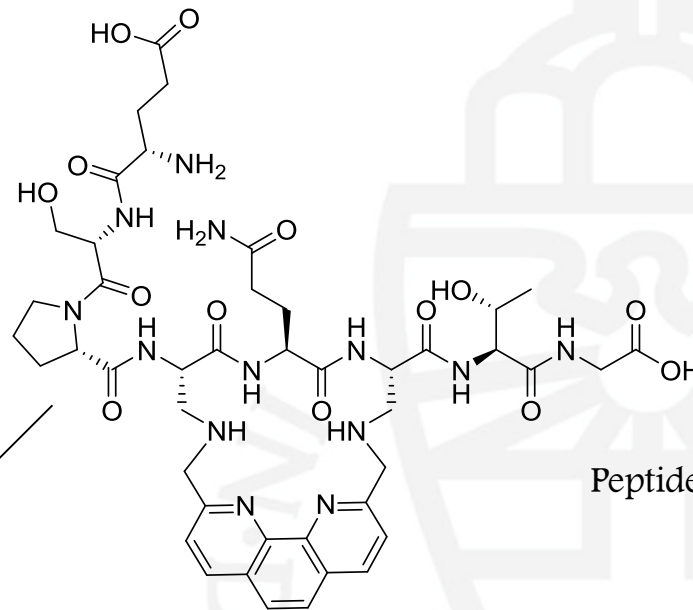
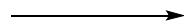
## Artificial enzyme synthesis



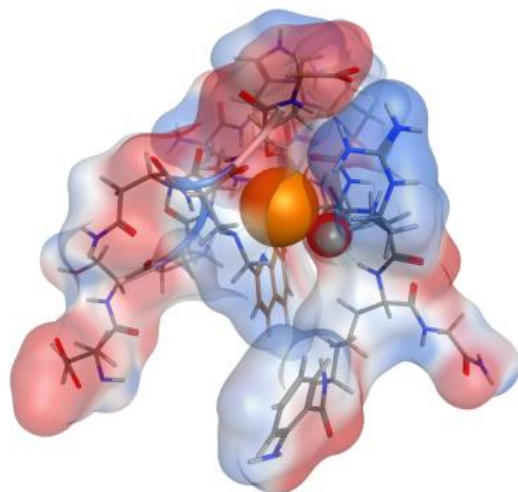
# Artificial enzyme synthesis



Phenanthroline ligand



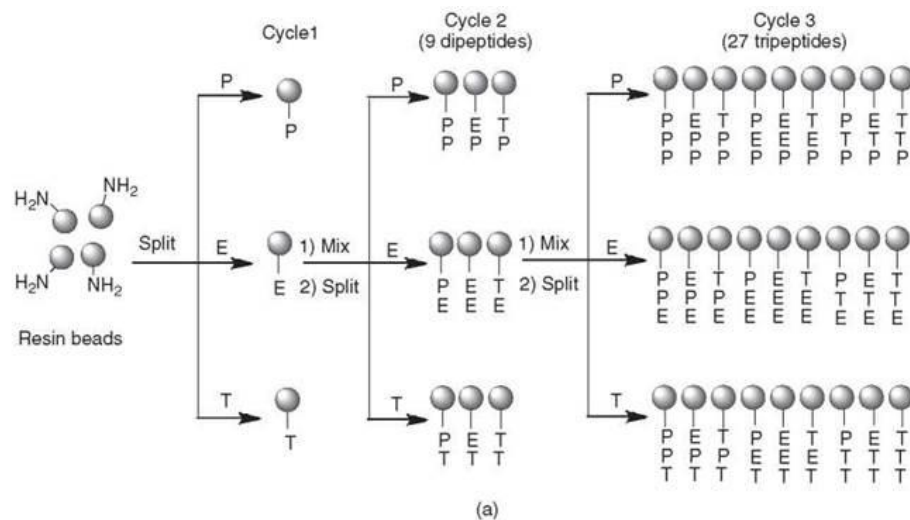
Peptide



Synthetic enzyme



# Activity assay of artificial enzymes



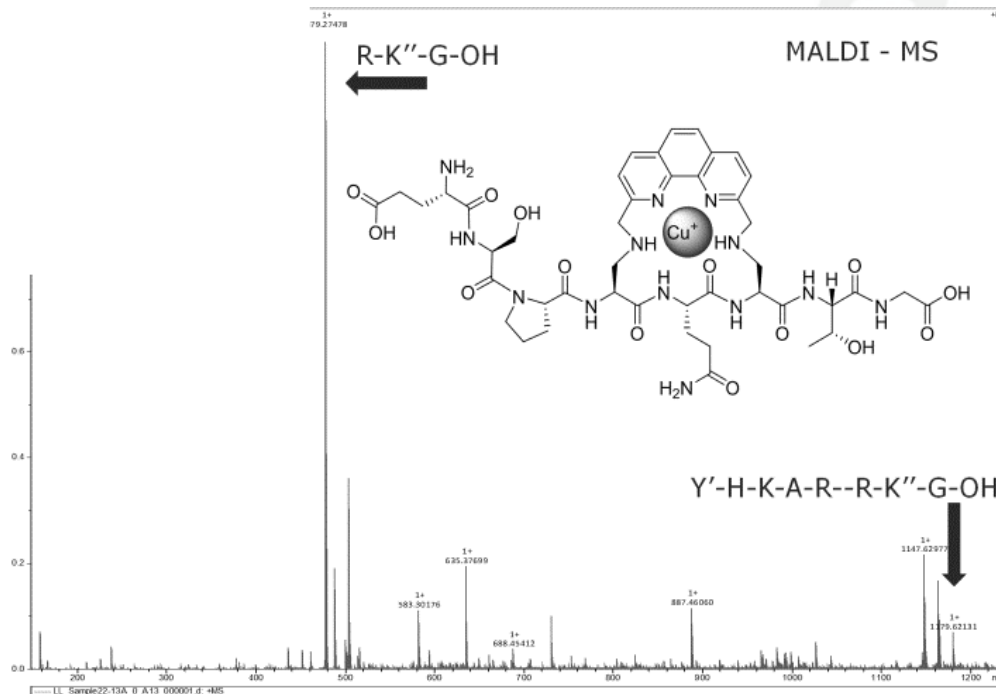
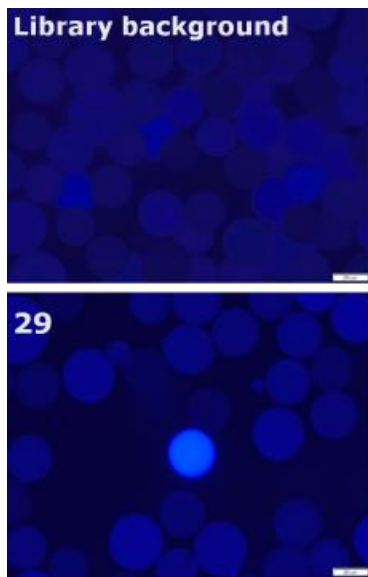
Building blocks	Reaction cycles	Library entities
20 natural amino acids	3	$20^3 = 8,000$
	4	$20^4 = 160,000$
	5	$20^5 = 3,200,000$
	6	$20^6 = 64,000,000$

FRET based peptide library synthesis (split-mix method)





# Artificial enzyme synthesis



MS/MS of the cleaved peptide sequence



## Artificial enzyme synthesis



Ligand synthesis



Metal complexation to peptides



# Centre for Evolutionary Chemical Biology (CECB)

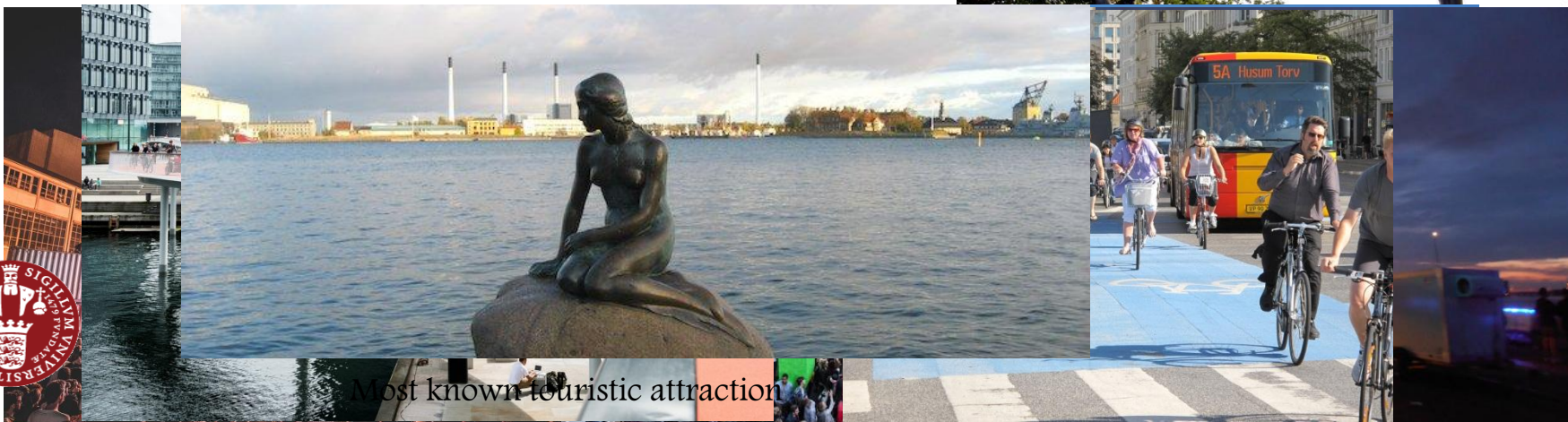


# Centre for Evolutionary Chemical Biology (CECB)



# Hyggelig København!

- Great atmosphere
- Beautiful buildings and parks
- Many festivities; the Danes go outside as soon as the sun starts to shine
- Danes are 'closed' people, but definitely like their alcohol and parties
- Biking culture, like we have it here
- In many things alike as the Dutch, even the word hyggelig



Frederiksberg Park

Most known touristic attraction  
Copenhagen (Best party city in the world)  
Kongens Have

# Studytrip

Have a very interesting and joyfull studytrip!

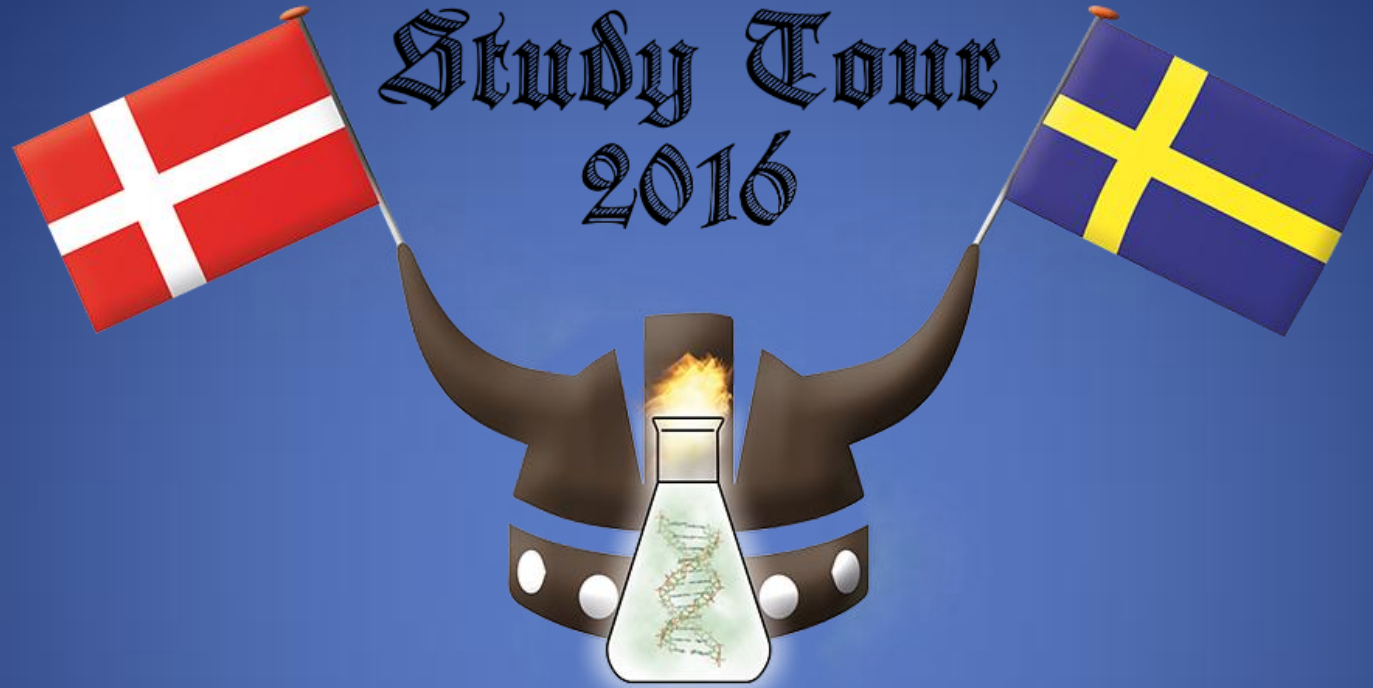


Mikkeller

For remaining questions

L.Lelieveldt@science.ru.nl





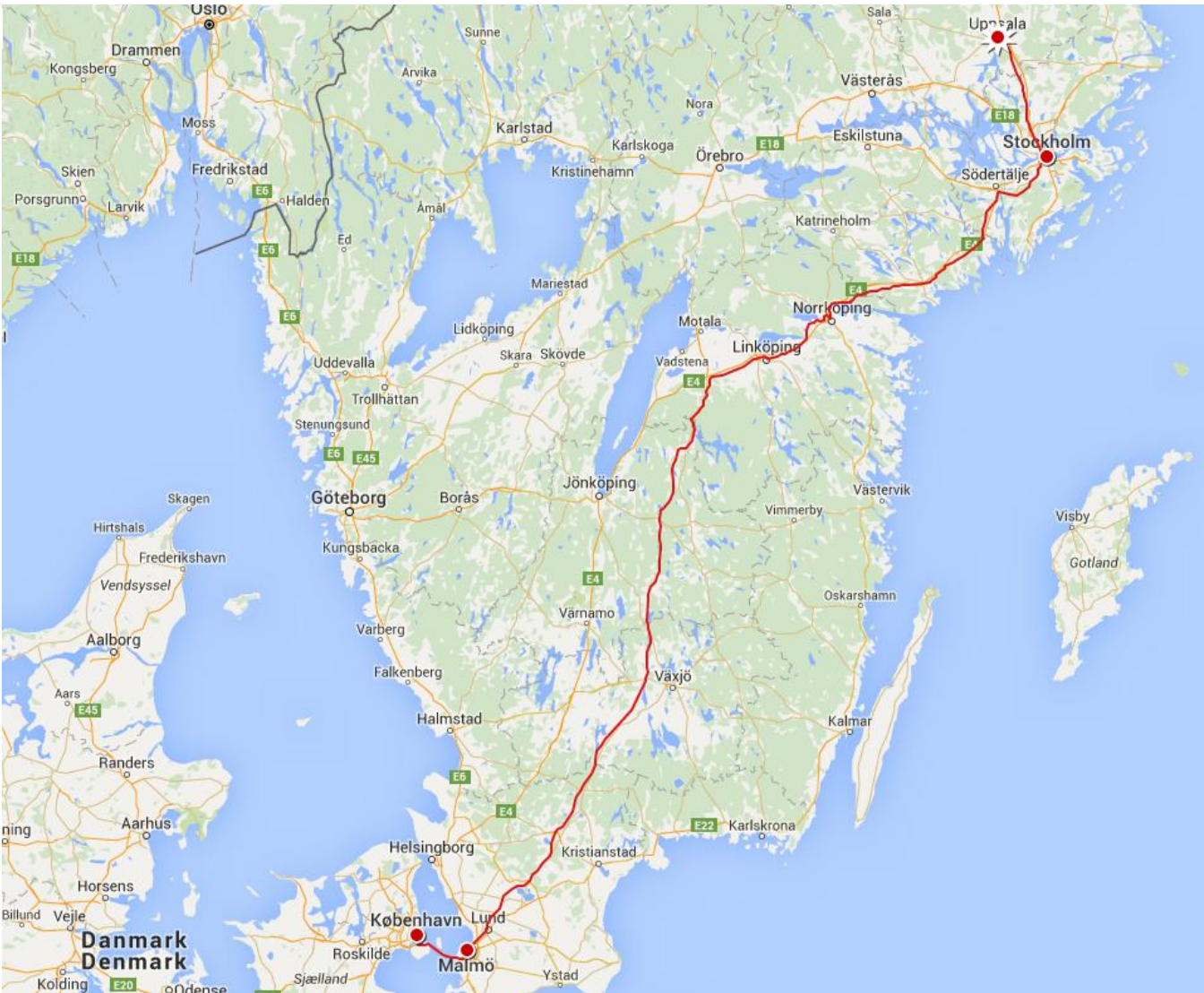
# Program



# What are the dates?

- King's Day: Wednesday 27<sup>th</sup> of April
- Departure: Thursday 28<sup>th</sup> of April
- Return: Wednesday 11<sup>th</sup> of May

# Where do we go?



## Sweden

- Uppsala
- Stockholm
- Malmö and Lund

## Denmark

- Copenhagen

# Thursday 28<sup>th</sup> of April - Day 1

- Flight from Schiphol to Stockholm Arlanda Airport (10.15 - 12.15)
- Train to Hostel in Uppsala (20 min)



# Friday 29<sup>th</sup> of April - Day 2

- Uppsala University



UPPSALA  
UNIVERSITET

# Saturday 30<sup>th</sup> of April - Day 3

- Valborg



# Sunday 1<sup>st</sup> of May - Day 4

- Travel to Stockholm
- Change of the Guard - Royal Castle
- Djurgården
  - Vasamuseet
  - Skansen



# Monday 2<sup>nd</sup> of May - Day 5

- Stockholm University
- Karolinska Institute



# Tuesday 3<sup>rd</sup> of May - Day 6

- Nobel museum
- Blue Hall in the Stockholm City Hall
- Travel to Malmö





# Wednesday 4<sup>th</sup> of May - Day 7

- Lund University
- MAX-lab
- Nation's Pub



**LUND**  
UNIVERSITY



# Thursday 5<sup>th</sup> of May - Day 8

- City tour Lund



# Friday 6<sup>th</sup> of May - Day 9

- Akzo Nobel Malmö
- City tour Malmö



# Saturday 7<sup>th</sup> of May - Day 10

- Travel to Copenhagen
- Sightseeing Tour (2,5 h)
- Nyhavn



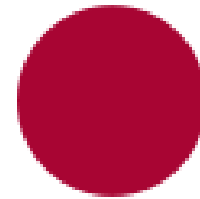
# Sunday 8<sup>th</sup> of May - Day 11

- National Museum
- Carlsberg Museum



# Monday 9<sup>th</sup> of May - Day 12

- Novo Nordisk
- University of Copenhagen



# Tuesday 10<sup>th</sup> of May - Day 13

- University of Copenhagen



# Wednesday 11<sup>th</sup> of May - Day 14

- Travel back home (flight: 11.50 AM)





# Whole trip

In general the activities are in the morning and afternoon. In principle, the evenings are free so there is plenty of opportunity to have a nice meal and drink a few.



# Eat/do list

- Suggestions?
  - Mail us
- Whapp group

# Questions or remarks?

- Contact: [studytrip2016@gmail.com](mailto:studytrip2016@gmail.com)
- Or ask one of us personally:

Yvonne Bartels

Willem Cox

Jon Donkers

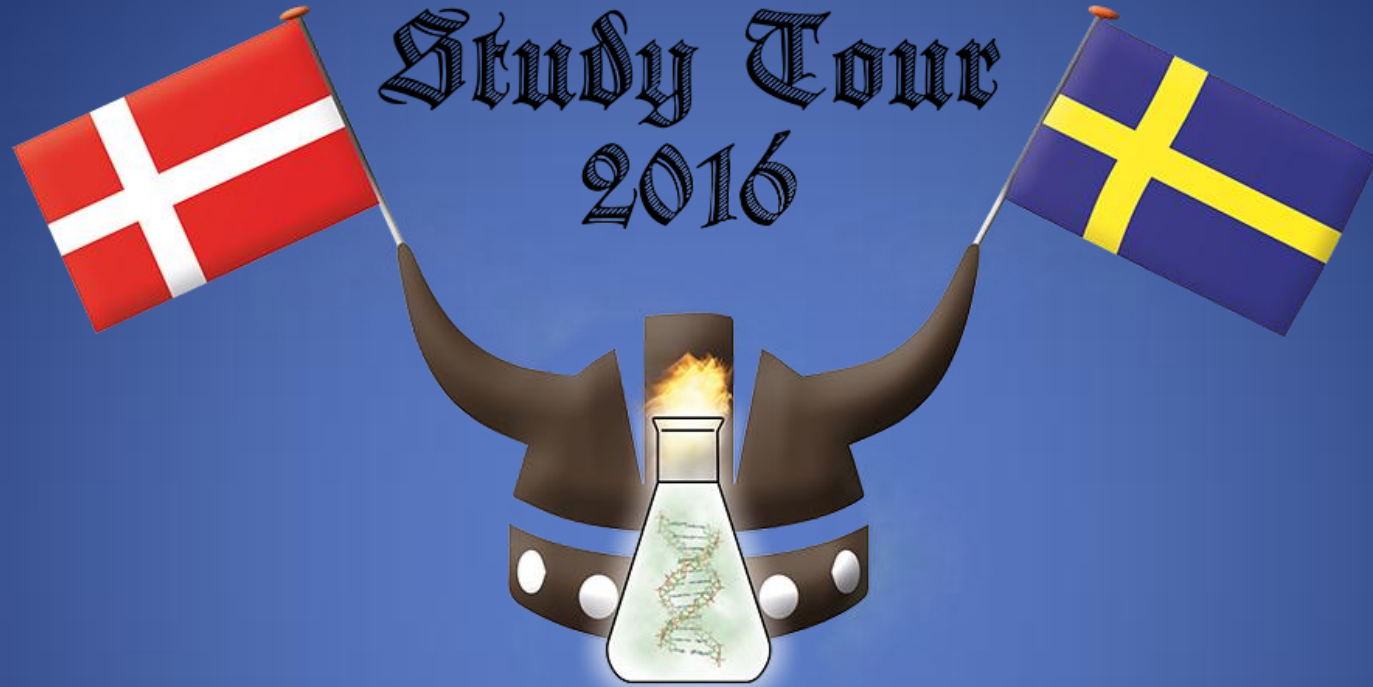
Tuur van den Eijnde

Diana Llerena Schiffmacher

Johan Pijnenborg

Feija Verstegen

Eline Visser



**Drinks**