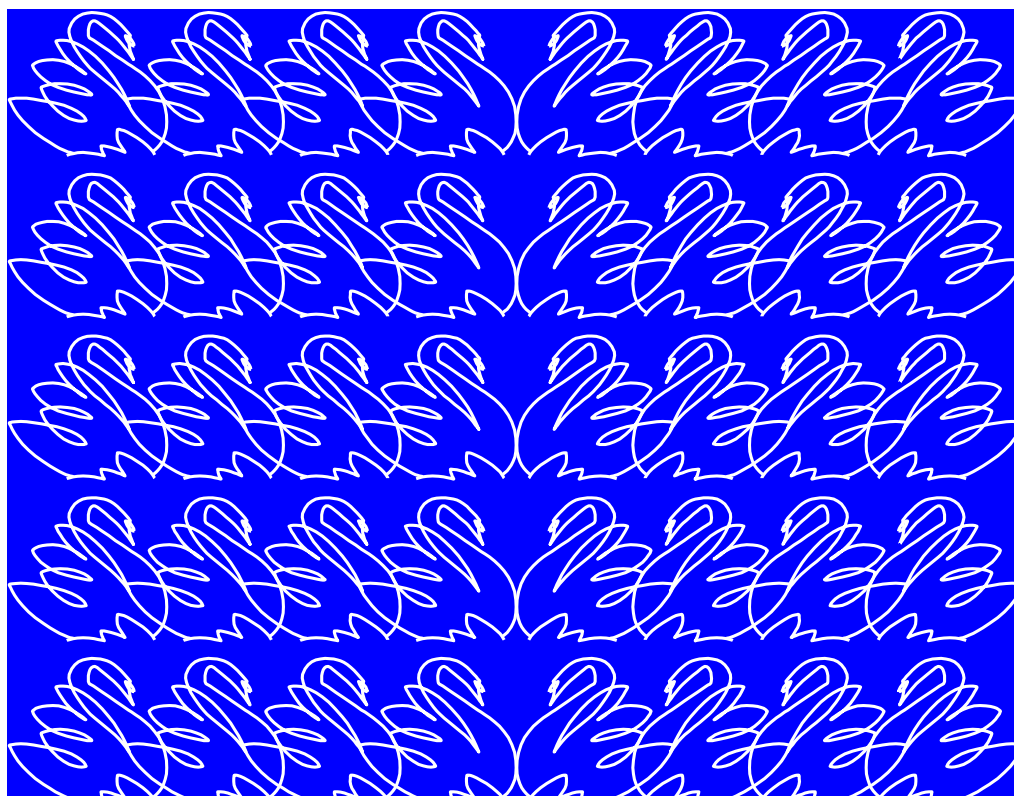




BENZON SYMPOSIUM
No. 63
NEW PARADIGMS OF PROTEIN ENGINEERING – APPLICATIONS IN
MODERN MEDICINE

AUGUST 21-24, 2017
COPENHAGEN, DENMARK



Organizing committee:

Kristian Strømgaard, Christian Adam Olsen, Stephan Alexander Pless, Morten Meldal,
Sven Frøkjær and Finn Cilius Nielsen



MONDAY, AUGUST 21, 2017

09:00-09:10 Welcome

Opening Keynote Lecture

Chair ***Christian A. Olsen***

09:10-10:00 ***Kevan Shokat***: Chemical tricks for drugging the undruggable

10:00-10:10 Discussion

Session I ***Expanding the Genetic Code***

Chair ***Benjamin G. Davis***

10:10-10:40 ***Jason W. Chin***: Reprogramming the genetic code

10:40-10:50 Discussion

10:50-11:10 **Coffee Break**

11:10-11:40 ***David Tirrel***: Non-canonical amino acids in protein engineering & analysis

11:40-11:50 Discussion

11:50-12:00 ***Abhishek Chatterjee***: Development and applications of universal platforms for genetic code expansion (*Poster number I-1*)

12:00-12:05 Discussion

12:05-13:00 **LUNCH**

13:00-13:30 ***Hiroaki Suga***: A RaPID way to discover pseudo-natural peptides and products

13:30-13:40 Discussion

Session II ***Post-translational Modifications***

Chair ***Tom W. Muir***

13:40-14:10 ***Kai Johnsson***: Fluorescent and Bioluminescent Sensor Proteins

14:10-14:20 Discussion

14:20-14:30 ***Nathaniel Brown***: Chemoselective labeling and immobilization of phosphopeptides with phosphorimidazolide reagents (*Poster number I-2*)

14:30-14:35 Discussion

14:35-14:45 ***Andreas S. Madsen***: HDAC inhibitors with picomolar affinities based on macrocyclic natural products (*Poster number I-3*)

14:45-14:50 Discussion

14:50-15:20 **Coffee Break**

15:20-15:50 ***Wilfred van der Donk***: Biosynthesis and Engineering of Cyclic Peptide Antibiotics

15:50-16:00 Discussion

16:00-17:30 Authors present posters Nos. I-1 to I-25

19:30-21:30 **Reception at Café Mazzolis in Tivoli (old amusement park)**
(walking time from hotel to Tivoli is about 15 min.)



TUESDAY, AUGUST 22 2017

Session III **Chemically modified proteins**

Chair *Kai Johnsson*

09:00-09:30 **Benjamin G. Davis:** Sugars and proteins – towards a synthetic biology

09:30-09:40 Discussion

09:40-10:10 **David James Craik:** Ultra-stable cyclic peptides as scaffolds in drug design

10:10-10:20 Discussion

10:20-10:50 **Coffee Break**

10:50-11:20 **Linda Hsieh-Wilson:** The sweeter side of cell signaling

11:20-11:30 Discussion

11:30-11:40 **Arnaud Gautier:** Hybrid fluorescent reporters for imaging cellular proteins on demand
(*Poster number II-1*)

11:40-11:45 Discussion

11:45-11:55 **Kurt Vesterager Gothelf:** DNA-Templated Conjugation of DNA to Proteins
(*Poster number II-2*)

11:55-12:00 Discussion

12:00-13:00 **LUNCH**

Session IV **Biomimetics and Bioactive Peptides**

Chair: *Hiroaki Suga*

13:00-13:30 **Morten Meldal:** Engineering of a chemist choice of antibody

13:30-13:40 Discussion

13:40-14:10 **Samuel H. Gellman:** Impact of backbone modifications on informational properties of polypeptides

14:10-14:20 Discussion

14:20-14:30 **David Niquille:** Engineering nonribosomal peptide synthetases for β -amino acids
(*Poster number II-3*)

14:30-14:35 Discussion

14:35-14:45 **Knud J. Jensen:** Peptide-oligonucleotide conjugates as nanoscale building blocks for assembly of an artificial three-helix protein mimic (*Poster number II-4*)

14:45-14:50 Discussion

14:50-15:20 **Coffee Break**

15:20-15:30 **Joseph Rogers:** The contribution of unnatural amino acids to the binding of cyclic and linear peptides (*Poster number II-5*)

15:30-15:35 Discussion

15:35-16:05 **Reza Ghadiri:** Novel therapeutics via remodeling of gut microbiome

16:05-16:15 Discussion

16:15-17:45 Authors present posters Nos. II-1 to II-19



WEDNESDAY, AUGUST 23, 2017

- Session V* ***Protein Evolution and Engineering***
Chair *David Tirrell*
- 09:00-09:30 ***Frances H. Arnold***: Innovation by evolution: expanding the enzyme universe
09:30-09:40 Discussion
- 09:40-10:10 ***Donald Hilvert***: Design and evolution of artificial enzymes
10:10-10:20 Discussion
- 10:20-10:50 **Coffee Break**
- 10:50-11:20 ***Manfred T. Reetz***: Recent Methodology Developments in Directed Evolution of Stereoselective Enzymes
11:20-11:30 Discussion
- 11:30-11:40 ***Kaare Teilum***: High-throughput generation of stabilized protein variants
(Poster III-1)
11:40-11:45 Discussion
11:45-11:55 ***Gabe Butterfield***: Evolution of a Designed Protein Assembly Encapsulating its Own RNA genome *(Poster III-2)*
11:55-12:00 Discussion
- 12:00-13:00 **LUNCH**
- 13:00-13:10 ***Christoph Giese***: Accelerating the association of the most stable protein-ligand complex by two orders of magnitude *(Poster III-3)*
13:10-13:15 Discussion
13:15-13:25 ***Christian Tornøe***: Divergent Protein Synthesis of Bowman-Birk Protease Inhibitors, their hydrodynamic behaviour and co-crystallization with α -Chymotrypsin *(Poster III-4)*
13:25-13:30 Discussion
13:30-13:40 ***Jakob Winther***: Improving the stability of computationally designed proteins using a new in cell folding selection *(Poster III-5)*
13:40-13:45 Discussion
- Session VI* ***Chemical Methods in Protein Synthesis***
Chair *Jason Chin*
- 13:45-14:15 ***Stephen Kent***: Reimagining the natural protein world using chemistry
14:15-14:25 Discussion
- 14:25-15:00 **Coffee Break**
- 15:00-15:30 ***Tom Muir***: Painting chromatin with synthetic protein chemistry
15:30-15:40 Discussion
- 15:40-16:10 ***Lei Liu***: Studies on the use of peptide hydrazides in chemical protein synthesis
16:10-16:20 Discussion
- 16:20-17:30 Authors present posters Nos III-1 to III-19
- 19:30-23:30 **Banquet at The University of Copenhagen**
(walk 19:25; time from hotel to University is about 3 min.)



THURSDAY, AUGUST 24, 2017

Session VII **Protein Structure and Design**

Chair *Donald Hilvert*

09:00-09:30 **David Baker:** The coming of age of de novo protein design

09:30-09:40 Discussion

09:40-10:10 **Aadrian Bax:** Studies of protein folding, misfolding, and unfolding by rapid pressure jump
NMR

10:10-10:20 Discussion

10:20-10:50 **Coffee Break**

10:50-11:20 **Poul Nissen:** Structure and mechanism of membrane transporters studied through protein
engineering

11:20-11:30 Discussion

11:30-11:40 **Nikos Hatzakis:** Form Conformational sampling to biomolecular recognition and diseased
phenotypes : a single molecule perspective (*Poster number III-6*)

11:40-11:45 Discussion

11:45-11:55 **Kresten Lindorff-Larsen:** Speeding up slow motions to see them in the computer (*Poster
number III-7*)

11:55-12:00 Discussion

12:00-13:00 **LUNCH**

Session VIII **Peptide and Protein Therapeutics**

Chair *David Craik*

13:00-13:30 **Peter Kurtzhals:** Towards the ultimate diabetes treatment

13:30-13:40 Discussion

13:40-14:10 **Robert Scott Lokey:** Beyond cyclosporine: Achieving passive membrane permeability in
synthetic cyclic peptides inspired by nature

14:10-14:20 Discussion

14:20-14:30 **Mette Ishoy:** Peptide-based PROTACs revisited: Towards Optimal Linker Design
(*Poster number III-8*)

14:30-14:35 Discussion

14:35-14:45 **Alessandro Zorzi:** Development of an albumin-binding ligand for prolonging the plasma
half-life of peptide therapeutics (*Poster number III-9*)

14:45-14:50 Discussion

14:50-15:20 **Coffee Break**

Final Keynote Lecture

15:20-16:10 **Peter S. Kim:** Toward an HIV vaccine: mimetics of the gp41 pre-hairpin intermediate

16:10-16:20 Discussion

16:20-16:30 Concluding Remarks



**RECEPTION
MONDAY, AUGUST 21, 2017
(19:30-21:30)**

**PARTICIPANTS, INVITED SPEAKERS
AND ACCOMPANYING PERSONS**

The reception will be held at **Café Mazzolis** located in **Tivoli**, the old amusement park.

Situated in Tivoli Gardens in the city center, the building in which Café Mazzolis is located has – at times – been Tivoli's ball room, the hippodrome and confectioner's tea room – since it was built in 1883.

The elegant architecture of the facade has been preserved while inside the restaurant is characterized by modern Scandinavian design as a counterpoint to the period exterior. In the same vein, the modern, Italian inspired cuisine can be enjoyed against the traditional background of a wonderful view of the Tivoli Lake and Promenade.

Dress code: Smart casual.



*No transportation will be provided for this event.
A group will assemble in the lobby and walk from the hotel to
Café Mazzolis at 19:15*



BANQUET
WEDNESDAY, AUGUST 23, 2017
(19:30-23:00)

PARTICIPANTS, INVITED SPEAKERS
AND ACCOMPANYING PERSONS

The banquet will take place at **The University of Copenhagen Ceremonial Hall** located at Vor Frue Plads, 1017 Copenhagen K.

The University is situated right across from the cathedral of Copenhagen, Vor Frue (Church of our Lady). The University was established more than 500 years ago, in 1479, but the present buildings are from the 19th century. With its more than 530 years, the University of Copenhagen is one of the oldest universities in Northern Europe. Being the largest institution of education and research in Denmark, the University has gone through numerous changes through the ages.



We are proud to hold the banquet in one of the city's most beautiful rooms, the University of Copenhagen Ceremonial Hall. The building was opened in 1836, but not until 60 years later was the decoration of the rooms finished. The Ceremonial Hall is decorated with paintings showing the University's history, an example is Wilhelm Marstrand's painting from 1871 showing the University's inauguration in 1479.

Dress code: Smart (Jacket, tie not required).



No transportation will be provided for this event.
A group will assemble in the lobby and walk from the hotel to the University at 19:25.

Website: www.benzon-foundation.dk