

# DNA, RNA and Synthetic Evolution

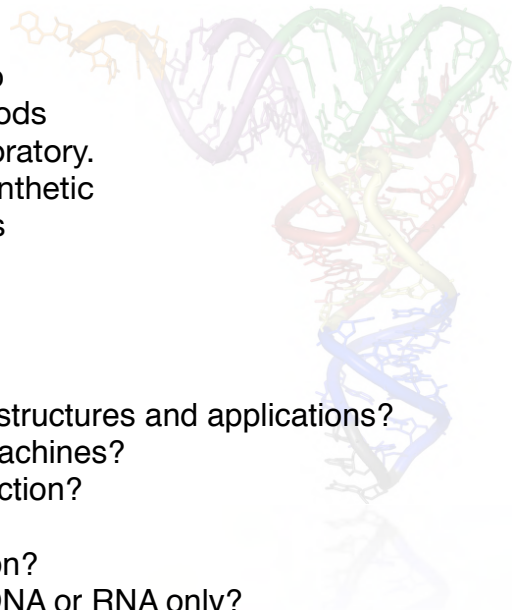
CeNS Workshop at the LMU Center for Advanced Study

Dec 18th, 2009, 9:00 am - 7:00 pm

Organizers: Prof. Dieter Braun (LMU), [dieter.braun@lmu.de](mailto:dieter.braun@lmu.de)  
Prof. Friedrich Simmel (TUM), [simmel@ph.tum.de](mailto:simmel@ph.tum.de)

## Topic

Evolution is a powerful process that can be utilized to solve complex problems. Using DNA and RNA, methods of synthetic evolution can be implemented in the laboratory. The Workshop will illuminate novel approaches of synthetic evolution to develop artificial structures and functions from different perspectives.



## Questions addressed

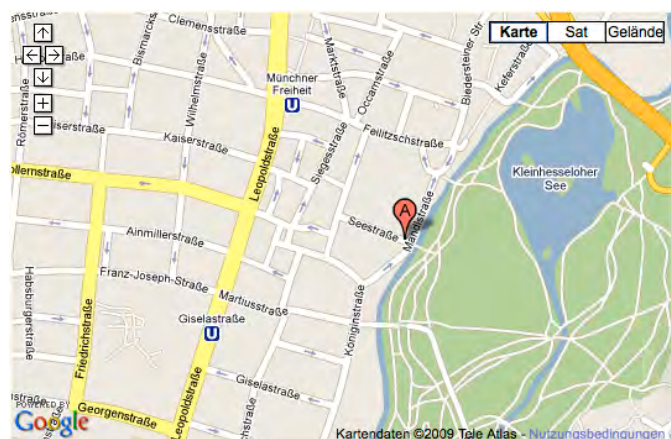
Can we extend schemes of in vitro selection to novel structures and applications?  
Can evolution be utilized to design novel molecular machines?  
How can we apply selection pressure for complex function?  
How large is the shape space of DNA?  
What are the limitations of nucleic acid based evolution?  
Can we construct self-replicating systems based on DNA or RNA only?  
What algorithms can be implemented using DNA and RNA reaction circuits?  
Can we test theories of evolution using molecules?  
What are the speed limitations of evolution?

## Who should come?

Students and researchers in biophysics and related fields interested in artificial and natural DNA or RNA structures as well as in evolutionary dynamics. **Participation is free of charge**, coffee, drinks and lunch will be provided by the organizers.

## Location

LMU Center for Advanced Studies  
Seestraße 13  
80802 München



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## *Schedule*

9:00 Welcome

9:15 Introduction (Dieter Braun, Friedrich Simmel)

9:45 Andreas Marx (Uni Konstanz): *tba*

10:15 Discussion

10:30 Ulrich Gerland (LMU Munich): *tba*

11:00 Discussion

11:15 Coffee break

11:45 Herve Isambert (Institut Curie): *RNA switches and networks*

12:15 Discussion

12:30 Wolfgang Stephan (LMU Munich): *Evolution of RNA secondary structures*

13:00 Discussion

13:15 Lunch buffet

14:15 Hendrik Dietz (TU Munich): *Scaffolding molecular evolution*

14:30 Discussion

14:45 Carmelo Di Primo (Uni Bordeaux): *Natural and artificial evolutions of RNA ligands to RNA targets*

15:15 Discussion

15:30 Michael Lässig (Uni Köln): *Quantifying natural selection at the molecular level*

16:00 Discussion

16:15 Coffee break

16:45 Ivo Hofacker (Uni Vienna): *tba*

17:15 Discussion

17:30 Martin Zacharias (TU Munich): *tba*

18:00 Discussion

18:15 Tim Liedl (LMU Munich): *tba*

18:30 Discussion

18:45 Closing remarks