The research group “Synthetic Biochemistry“ of Dr. Michael Lammers at the *Cologne Cluster of Excellence: Cellular Stress Responses in Aging-Associated Diseases* (CECAD) of Cologne University has the following position available:

PhD Student Position
(50% German TV-L E13)

Synthetic Biology:
Lysine acylation in cellular regulation, aging and disease

Institution information: Cologne Cluster of Excellence: Cellular Stress Responses in Aging-Associated Diseases (CECAD), CECAD Research Center, University of Cologne, Joseph- Stelzmann-Str. 26, D-50931 Cologne, Germany

Location: CECAD is located in the vibrant city of Cologne and forms a focal point of aging research in Europe bringing together international researchers of Cologne University with researchers at the Max Planck Institute for Biology of Aging.

Our Group: Our group applies a combined synthetic biological, biochemical, cell biological and biophysical methodology, including X-ray crystallography to unravel how protein function is regulated by post-translational lysine acylation. Lysine acetylation was discovered in 1964 by Vincent Allfrey to occur on histones. Nearly three decades later it turned out that the yeast enzyme Sir2 has an NAD^+-dependent deacetylase activity. Sirtuins are implicated in regulation of lifespan and healthy aging and do play protective roles in the development of severe diseases such as neurodegenerative diseases as well as cancer.

Recently, it was shown that lysine side chains are targeted by diverse acylations. Palmitoylation and succinylation at lysine side chains might exert mechanistically different regulatory roles compared to lysine acetylation. We use a synthetic biological approach to site-specifically incorporate different lysine acylations into proteins to obtain pure, homogenously acylated proteins in yields sufficient to conduct biophysical studies including X-ray crystallography. Using these proteins we will structurally characterise lysine deacetylase full-length substrate complexes. So far, structures of deacylases are only known for complexes with acylated peptides. The results will clarify the molecular determinants of deacylase specificity and will support the development of novel deacylase inhibitors for therapeutic approaches.

Qualifications: Candidates should have a solid background in molecular biology and biochemistry. Experience in protein purification and structural biology is desirable but not essential. Applicants should be enthusiastic for scientific research, they should be be motivated and creative. We expect good communication skills, fluent English and the ability for teamwork.

The position: Initially available for two years with the possibility to extend.

For more information: **http://lammers.cecad-labs.uni-koeln.de/Home.449.0.html**

How to Apply: Please send your CV, letter of intent, names and addresses of three references as single PDF to **michael.lammers@uni-koeln.de**