# The evolution of trafficking: from archaea to eukaryotes

Initiative: "Leben?" - Ein neuer Blick der Naturwissenschaften auf die grundlegenden Prinzipien des Lebens

(beendet)

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Phylogenomic data suggests that eukaryotes arose by symbiosis between an archaeal cell and a bacterial partner. However, this does little to explain the origins of the elaborate membrane and vesicle trafficking systems that underpin eukaryotic cell organization, since the closest living relatives of these two partners that can currently be studied at the cellular level (TACK family archaea and alpha-proteobacteria) lack internal membranes. Nevertheless, TACK archaea, such as Sulfolobus, generate exosomes, extracellular vesicles. The generation and scission of exosomes in those archaea appear to depend on the ESCRTIII system, as does the generation of vesicles in eukaryotes. Building on these observations, which suggest striking parallels between archaeal and eukaryotic vesicle trafficking, this cross disciplinary team will use a range of methods, including structural, molecular and cell biology together with computational modelling to determine: how archaeal exosomes are formed and shed; how the process, including cargo loading, is regulated. By elucidating the physical, biochemical and cellular mechanisms of secretion in Sulfolobus and through a comparative analysis with eukaryotes, this work will reveal the fundamentals of this key aspect of eukaryotic cell biology in its evolutionary origins.

**Projektbeteiligte**

**Prof. Dr. Sonja-Verena Albers**
Universität Freiburg
Institut für Biologie II
Freiburg

**Prof. Dr. Buzz Baum**
University College London
MRC-LMCB
FLS
London
Grossbritannien

**Prof. Dr. Lars-Oliver Essen**
Universität Marburg
Department of Chemistry
Centre for Synthetic Microbiology
Marburg

**Prof. Dr. Jan Löwe**
MRC Laboratory of Molecular Biology
Structural Studies
Cambridge
Grossbritannien

**Prof. Dr. Andela Saric**
Institute of Science and Technology
Austria (IST Austria)
Computergestützte Physik weicher und lebender
Materie
Klosterneuburg
Österreich

**Open Access-Publikationen**

**The Phosphatase PP2A Interacts With ArnA and ArnB to Regulate the Oligomeric State and the Stability of the ArnA/B Complex.**
**SaUspA, the Universal Stress Protein of Sulfolobus acidocaldarius stimulates the activity of the PP2A Phosphatase and is involved in growth at high salinity.**