

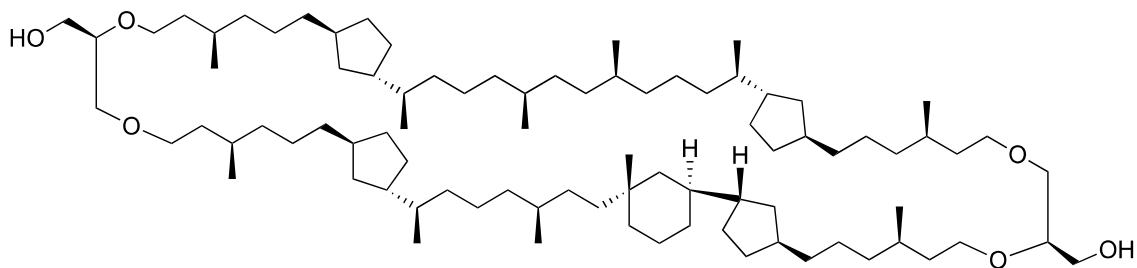
# TOWARDS THE TOTAL SYNTHESIS OF CRENARCHAEOL

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Crenarchaeol is an archaeal membrane spanning tetraether lipid found exclusively in archaea belonging to the thaumarchaeota phylum, which are highly abundant in oceans.[1,2] It has been hypothesized that this membrane lipid is produced by these microorganisms to adapt to the marine environment (low temperatures and high pressures). It would create a less densely packed membrane due to the presence of a cyclohexane ring.[3]

Crenarchaeol with its 22 mostly remote stereocenters, macrocyclic structure and almost complete absence of heteroatom functional groups is an intriguing molecule. In addition to that, it features a unique 5-6-membered ring system, the stereochemistry of which has been proposed<sup>3</sup> but not proven to this date. Thus, we are working on the first asymmetric total synthesis of crenarchaeol in order to unravel its stereo- and regiochemistry and demonstrate that with the current state of organic synthesis this molecule is within reach.



Proposed Structure of Crenarchaeol

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[1] J. Yang, H. Jiang, H. Dong, W. Hou, G. Li, G. Wu, *Sci. Rep.* **2015**, *5*, 18071-18079

[2] M. B. Karner, E. F. DeLong, D. M. Karl, *Nature* **2001**, *409*, 507-510

[3] J. S. S. Damsté, S. Schouten, E. C. Hopmans, A. C. T. van Duin, J. A. J. Geenevasen, *J. Lipid Res.* **2002**, *43*, 1641-1651