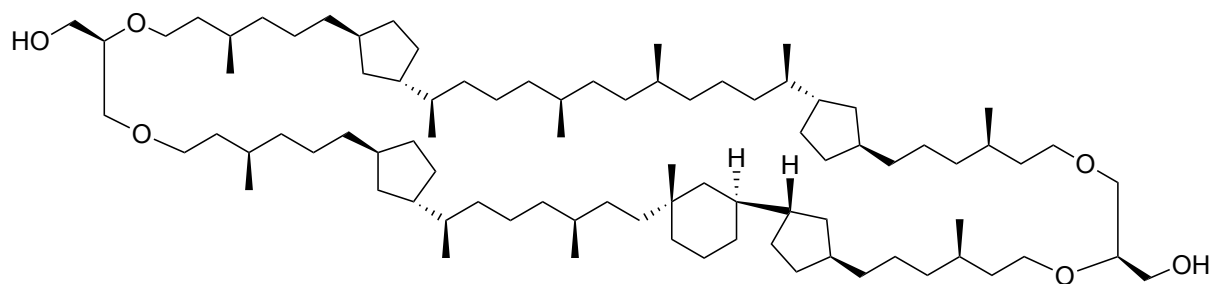


# Towards the Total Synthesis of Crenarchaeol

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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.<sup>1,2</sup> 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.<sup>3</sup>

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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