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As another year draws to a close, you may find yourself in a retrospective mood. In this issue, Gareth Griffiths (page 1018) looks back ~ 3 billion years and reflects on how the first cells formed. The premise of cellularization theories is that all life evolved from one source, the last common ancestor (LCA). Earlier models propose that cellularization occurred inside randomly formed vesicles in high-salt environments — known as the ‘cytoplasm within the vesicle’ scenario. However, how the LCA formed from the ‘primordial soup’ and how kingdoms of life, particularly prokarya and eukarya, might have diverged from the LCA are not well supported by attempts to experimentally validate ‘cytoplasm within the vesicle’ models.

Griffiths describes the ‘cytoplasm outside the vesicle’ scenario, which challenges previous dogma. According to this model, the cytoskeleton (components of which were thought to be eukaryotic until a few years ago) was required before and as part of the mechanism that led to cellularization. The model proposes that the protocytoplasmic components — genetic material, the membrane and the cytoskeleton — that formed the LCA evolved in fresh water, probably on a mineral rock surface on which small vesicles (that later formed the cell membrane) developed randomly. This environment would probably have promoted randomization of the ‘primordial soup’, which might have improved the probability of cellularization. So, although we might not always look back this far, a retrospective view can lead to exciting new ideas.

As a holiday gift, accompanying this issue is a poster ‘Readout of chromatin marks by histone-binding modules’ by C. David Allis, Dinshaw J. Patel and colleagues (see page 983 for their Review). The poster (www.nature.com/nrm/posters/histonemarks) was produced with generous support from Abcam.

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