Centimeter-scale cycles occur in shale successions ONLY in distalmost settings of the Alum and Tøyen Formations in Scandinavia. Intense bioturbation is made responsible for the lack of cycle preservation in fine-grained rocks.

(A): Two burrow types characterize the Alum and Tøyen Shales in Scandinavia: horizontal (red arrow) and multi-directional (white arrows)
(B): SEM image showing lack of organic material in horizontal burrow, outlined by yellow dots.
(C): SEM image of detail from B showing minerals in burrow - a pyrite, b illite, c K-feldspar, d quartz, e organic matter outside burrow

SEM (Scanning electron microscope) images