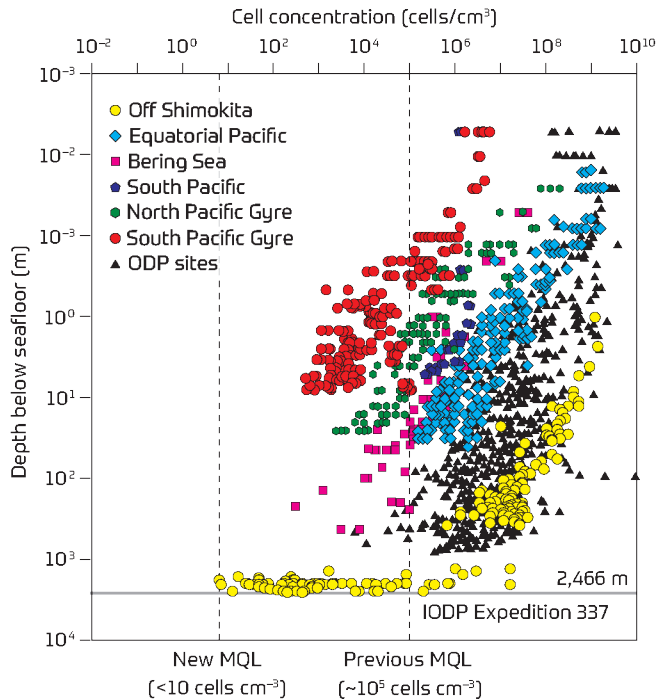
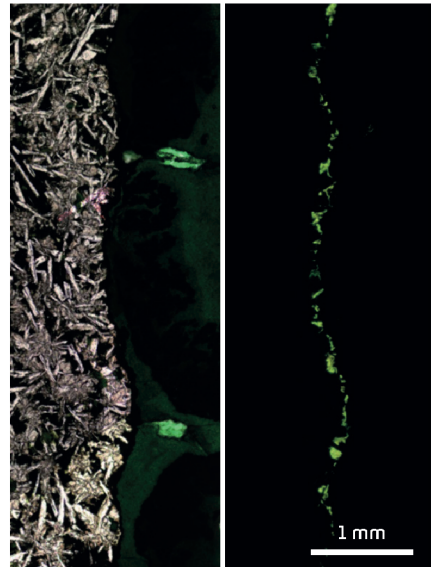


### (a) Microbial Cell Counts in the Sediment-Hosted Deep Biosphere



### (b) Evidence of Ocean Crust-Hosted Microbial Life



(a) Scientific ocean drilling has made great advances in sampling the biosphere within the ocean sediment column globally, mapping regional variations in the exponential decrease in cell abundance with depth. Novel techniques have allowed scientists to lower the minimum quantification limit for sedimentary microbial cell enumeration (MQL) by several orders of magnitude and demonstrate that microbial life extends more than 2 km beneath the seafloor where cell counts were as low as 10 cells/cm<sup>3</sup> (yellow dots clustered around 2,466 meters below seafloor constitute the deepest subseafloor sediment samples examined for life to date; IODP Expedition 337 Site C0020; Inagaki et al., 2015, <https://doi.org/10.1126/science.aaa6882>). (b) Scientific ocean drilling is also significantly enhancing knowledge of the composition, origin, and heterogeneous distribution of communities in subseafloor igneous crust, as illustrated here by the microbial colonization of a basalt hosted hydrothermal celadonite vein (light [left] and fluorescence microscopy [right] of SYBR Green I-stained microbial cells). A future goal is to obtain microbial samples from within oceanic crust of all ages to determine cell counts and to investigate how the distribution of microbes relates to fluid pathways and the extent to which the biosphere facilitates hydrothermal exchange. (a) From: D'Hondt et al. (2019), <https://doi.org/10.5670/oceanog.2019.146>. (b) From Suzuki et al. (2020), <https://doi.org/10.1038/s42003-020-0860-1>