IN BRIEF

MARINE MICROBIOLOGY

Changing climate, changing plankton communities

The global increase in atmospheric CO_2 concentration and the subsquent temperature rise has dramatically altered the marine ecosystem, including planktonic microorganisms. Two new studies describe the long-term shifts in plankton community composition in response to climate change. Corals incorporate essential amino acids, which they cannot synthesize themselves but have to take up from primary producers, into their proteinaceous skeleton. McMahon *et al.* used carbon isotope fingerprinting of these amino acids from long-lived Hawaiian gold corals to investigate shifts in plankton communities over the past 1,000 years. In general, photoautotrophic cyanobacteria were the main producers of organic matter. However, different climate periods were characterized by substantial shifts in primary producers. The Medieval climate anomaly, a period of warm sea surface temperatures and weak winds, was dominated by non-nitrogen-fixing cyanobacteria, probably in response to nutrient limitation. This was followed by the Little Ice Age, when the supply of inorganic nitrate increased and eukaryotic microalgae provided almost half of the carbon sources. In the past 150 years, an unprecedented shift in the plankton regime was observed. Community composition exhibited a rapid increase in nitrogen-fixing cyanobacteria, which might represent a negative feedback to rising CO_2 levels. Rivero-Calle *et al.* also investigated changes in plankton composition during the recent phase of increasing CO_2 and temperatures using Continuous Plankton Recorder surveys, a sampling network based on shipping routes in the North Atlantic. In the 1960s, ~1% of samples contained coccolithophores, which are unicellular calcifying algae, whereas >20% of samples from the 2000s contained these organisms. Statistical models indicate that CO_2 concentrations are the best predictors of this change, a result that corresponds with laboratory data from previous publications on coccolithophore growth under different CO_2 levels.

ORIGINAL ARTICLES McMahon, K. W. *et al.* Millenial-scale plankton regime shifts in the subtropical North Pacific Ocean. *Science* http://dx.doi.org/10.1126/science.aaa9942 (2015) | Rivero-Calle, S. *et al.* Multidecadal increase in North Atlantic coccolithophores and the potential role of rising CO_2. *Science* http://dx.doi.org/10.1126/science.aaa8026 (2015)

PARASITE BIOLOGY

Hepatocyte receptor for *Plasmodium*

Liver invasion is an essential step for the establishment of malaria. Sporozoites, which are the transmitted parasite stages, invade hepatocytes to establish productive infection in the parasitophorous vacuole. Kaushansky *et al.* now shed light on the molecular mechanism underlying this process. They show that ephrin receptor A2 (EPHA2) determines hepatocyte permissiveness to infection; hepatocytes with high EPHA2 expresssion were preferentially infected. Furthermore, *Epha2*$^{-/-}$ mice showed reduced infection with *Plasmodium yoelii*, as did wild-type mice infected with parasites lacking the P52 and P36 surface proteins, which contain ephrin domains.

ORIGINAL ARTICLE Kaushansky, A. *et al.* Malaria parasites target the hepatocyte receptor EphA2 for successful host infection. *Science* **350**, 1089–1092 (2015)