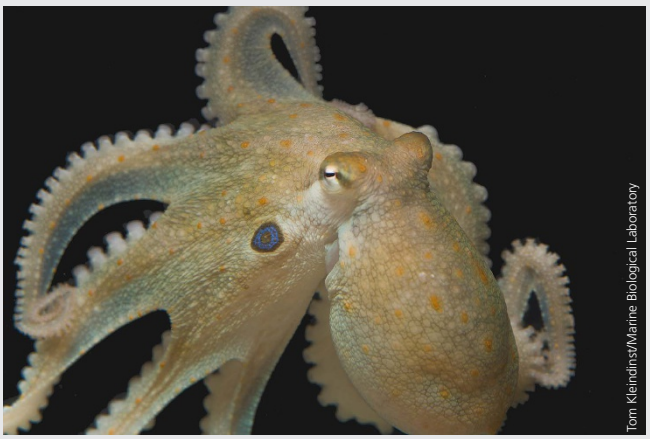
NEWS BRIEFS

Cephalopods go rogue with extreme RNA editing

Defying the central dogma of faithful DNA copying has consequences. That's the conclusion from new research exploring the odd RNA transcription system that octopuses, squid, and their cephalopod cousins use to flexibly alter which proteins are made. These fascinating sea creatures regularly edit more than half of their messenger RNA by replacing adenines with inosine before it is translated into protein. It was already known that the rapid edit strategy is used to adapt to temperature changes and other environmental stimuli, but the new study, published 6 April 2017 in *Cell*, shows the consequences of extensive RNA editing. The international team of researchers found evidence that the elaborate sequence requirements to allow this form of RNA editing preclude the animals from readily sustaining DNA mutations, and hence affect evolution. The strategy of using RNA editing to alter proteins on demand, rare in the animal world, essentially places the genome in a steady state where it remains with little change. "Basically, this is a mechanism to make proteins that are not encoded in the DNA. They are not present in the genomic sequence," says study coauthor Eli Eisenberg, a biophysicist at Tel Aviv University in Israel. "With these cephalopods, this is not the exception. This is the rule. The rule is that most of the proteins are being edited." In genetic analysis across species, this pattern held true across the cephalopods studied. Other sea creatures used for comparison did not use RNA editing nearly to the same extent. "We usually think of evolution using whatever it can to answer some challenges—so why was RNA recoding not used?" says Eisenberg. "Now, we have an example of what happens when we do use RNA editing abundantly. We know there's a price. The price is slowing down genome evolution."—*Karyn Hede, News Editor*



Tom Kleindinst/Marine Biological Laboratory

Laws governing genetic discrimination in Canada and US generate controversy

It seems there is no pleasing anyone with proposed new laws governing the privacy of genetic information. In both the United States and Canada, efforts to further regulate individual rights to withhold genetic information from employers and insurers generated ire, but for opposite reasons. In Canada, a bill outlawing genetic discrimination that passed the House of Commons is in limbo after Prime Minister Justin Trudeau's administration raised objections to some of its provisions on constitutional grounds. Bill S-201 prevents companies from requiring employees to undergo genetic testing and insurers from forcing prospective customers to undergo genetic testing before approving coverage. Until now, Canada was the only large Westernized country not protecting individuals against genetic discrimination. The Canadian insurance industry has spoken out against it, threatening increased premiums if the law stands up in court. On the other side of Canada's border, a bill put forth in the US House of Representatives would allow employers to gather genetic information as part of "workplace wellness" programs and then use that information to set insurance premiums and deductibles. The bill would let employers impose a 30% premium on employees who opt out of such programs. Currently, it is illegal in the United States for employers to demand genetic test results from workers. In March 2017, ACMG, along with dozens of health and patient-advocacy groups, cosigned an open letter to the bill's sponsors opposing the legislation, stating, "We strongly oppose any legislation that would allow employers to inquire about employees' private genetic information or medical information unrelated to their ability to do their jobs, and to impose draconian penalties on employees who choose to keep that information private."—*Karyn Hede, News Editor*