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Reversing unnatural selection

In fisheries, because humans tend to harvest the largest fish, smaller fish have a greater chance of survival. As a result, fish in these areas gradually evolve to become smaller, take longer to mature and become less productive. These traits are clearly undesirable from a fishery manager's perspective, and they may also impair the ability of the fish to survive in their environment once fishing ceases. Theoretical research has suggested that this shrinkage may be irreversible.

David Conover and colleagues from Stony Brook University (NY) investigated six captive populations of silverside fish to test whether the evolution process could be reversed (*Proc. R. Soc. B,* published online 4 March 2009; doi:10.1098/rspb.2009.0003). For each population, they continuously harvested either small or large fish (with randomly harvested populations as control groups) over five generations. They then stopped fishing and examined the development of the silverside populations for five more generations.

In populations in which large fish were harvested, silversides evolved to become much smaller, as expected. After cessation of fishing, fish size recovered slowly but substantially. Though this is good news for managers of fisheries, the researchers caution that the reversal process is very slow and may take several decades for certain types of fish.

Showing teeth where to grow

Tooth growth in mammals is restricted to a single row, whereas non-mammalian vertebrates, such as sharks, grow multiple rows of teeth. Until recently, the mechanisms that enabled or restricted iterative tooth development were not well understood. Understanding these regulatory mechanisms may hold benefits for humans—we don't need multiple rows of teeth, but being able to reactivate the tooth development pathway later in life may offer a strategy for regenerating teeth lost to tooth decay or gum disease.

New insights into the control of dental patterning came from Rulang Jiang (University of Rochester Medical Center, NY) and colleagues. The researchers generated mice that lacked the gene encoding a transcription factor called odd-skipped related-2 (Osr2) and noticed that the knockout mice developed extra teeth lingual to their molars (*Science* **323**, 1232–1234; 2009). Jiang's group carried out a series of experiments evaluating the development of the extra teeth. They found that Osr2 functions as a switch, affecting the expression of two other signaling molecules; this signaling pathway controls tooth formation.

The study results may also be important for research into cleft palate. Osr2-deficient mice were all born with severe cleft palate, suggesting that understanding the function of this protein may someday help to prevent this treatable birth defect.

Vets wanted

The US federal government faces a shortage of veterinarians, according to a report published in February by the Government Accountability Office (http://www.gao.gov/new.items/d09178.pdf). The work of government veterinarians is critical for research and control of animal-borne diseases and for many aspects of public health and government-funded animal research.

Several government agencies reported veterinarian shortages. The Food Safety and Inspection Service, whose veterinarians monitor the health and humane treatment of animals at slaughter plants, reported a 15% shortage; this may limit the agency's ability to ensure adequate food safety. The Agricultural Research Service, whose veterinarians research endemic and foreign animal diseases, reported a 12% shortage of vets. The National Institutes of Health reported challenges in recruiting laboratory animal veterinarians and veterinary pathologists. Other government agencies such as the Animal and Plant Health Inspection Service are currently adequately staffed but may face problems in 2011, when a large percentage of their work force becomes eligible to retire.

The veterinarian shortage is expected to worsen, partly because the country's 28 veterinary colleges, which are currently at full capacity, can graduate only about 2,500 students a year combined, according to a recent statement by the American Association of Veterinary Medical Colleges.