TOUCHING BASE

QUESTIONS? THOUGHTS? IDEAS?
e-mail us at ngfeedback@natureny.com

Mutant of the Month

This month, we pay tribute to the chicken mutant scaleless (*sc*), our May MoM. First described in 1957 by Ursula Abbott and Vigfus Asmundson, this featherless bird made headlines 2 years ago when scientists at the Hebrew University of Jerusalem bred scaleless to a commercial broiler chicken to create a prototype 'featherless broiler'. Although the *sc* gene product remains unknown, tissue grafting experiments showed that *sc* is required in the epidermis for the development of ectodermal placodes, specialized signaling centers that interact with cells of the underlying dermis to produce feather buds. A 1996 study by Paul Goetinck and colleagues further showed that applying FGF2 protein to the skin of *sc* embryos was sufficient to induce feather formation in these otherwise naked fowl. So are chickens happiest when adorned in their typical plumage, or are *sc* mutants proud to sport their distinctive bald look? The ethologists, to our knowledge, have yet to weigh in. But the budding market for hair growth products among humans leads us to presume that some *sc* hatchlings might look upon their feathered clutch mates with a tinge of envy. ***KV***

Photo courtesy of Bruce Morgan and Roger Sawyer

Trouble with ART?

Emily Niemitz and Andrew Feinberg are calling for an investigation of assisted reproductive technologies (ART) and their possible effects on epigenetic mechanisms during development (*Am. J. Hum. Genet*. **74**, 599–609; 2004). The authors reviewed previously published work on associations of *in vitro* fertilization (IVF), intracytoplasmic sperm injection and related procedures with birth weight and birth defects such as Prader-Willi and Beckwith-Wiedemann syndromes. Although they note the limitations of many of these studies, the apparently consistent association of ART with disorders of imprinting, like Beckwith-Wiedemann, leads to them to two key proposals: (i) a large prospective study of such a link and (ii) more research into the relationship between ART and epigenetic defects and the underlying mechanisms that might link the two. To this end, Niemitz and Feinberg note that the US Food and Drug Administration should consider requiring companies to disclose the formulation of media used for IVF, given that epigenetic regulation in animal embryos is known to be affected by medium composition. *AP*

Touching Base written by Myles Axton, Alan Packer and Kyle Vogan

HEP-cataloging 'epi-SNPs'

The Human Epigenomics Consortium (http://www.epigenome.org), consisting of The Centre National de Génotypage, Epigenomics AG and the Wellcome Trust Sanger Institute, started last year with a pilot project to determine the methylation status of the sequences of the MHC cluster on chromosome 6 for a number of normal human organs: adipose, brain, breast, liver, lung, muscle and prostate. The results can be seen in an Ensembl-linked browser that allows viewing of methylation variable positions associated with each gene and tissue. The project plans to release data as more regions are characterized. A recent poster from Sequenom at the American Association for Cancer Research meeting in Orlando, Florida (March 2004) proposes a high-throughput method for epigenotyping that may facilitate work in this field. Bisulfite-treated genomic DNA is amplified by PCR and then converted to two separate single strands that are separately subjected to base-specific cleavage, and the resulting patterns are analyzed by MALDI-TOF mass spectrometry. The method is suitable for screening large regions and identifying the precise cytosine residues and their degree of methylation. Correlating the patterns of methylation with patterns of gene activity will be an enormous task, but many publications on epigenetic regulation in both cancer and development illustrate the importance of the undertaking. *MA*

Bred to be cast upon the waters

Evolution works with preexisting materials, and preadaptation is thought to be widespread. The selective forces leading to phenotypic adaptations can be tortuous. These two phenomena are both well-illustrated by one example of selective breeding. Short, stiff hackle feathers of the fowl are a secondary sexual characteristic used in display, allowing the male to appear larger and more impressive, or to avoid confrontation, as the situation demands. Softer hackles serve the same purpose in the hen. Selection for hackles that can mimic an insect on an air-water interface has been exerted indirectly by fish, by way of the exacting demands of enthusiasts of dry-fly fishing and the work of poultry geneticists. Hackle length is a quantitative trait that has responded substantially to selection, yielding feathers that grow continuously to great lengths that can be easily tied into effective artificial flies. The grizzly coloration of this rooster is conferred by a sex-linked barring mutation, B, one of the first published monogenic traits. Its background is the Plymouth Rock Bantam strain, containing polygenic determinants of body size, among which the sex-linked recessive dw^B has a large effect. Its lifelike pose is an environmental phenocopy (T. Whiting, personal communication. http://www.whitingfarms.com). ***MA***

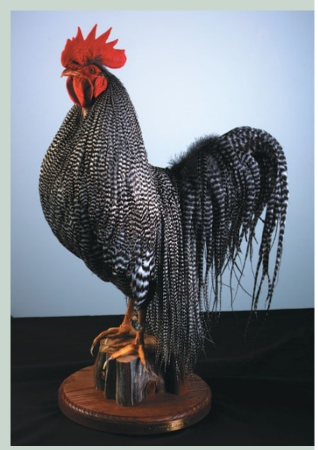

Photo courtesy of T. Whiting