



GENETICS DAYS OF WINE AND ROSIDS

Understanding variation, particularly in the context of genetic heterozygosity, is an important step in the effort to improve domestic crops, especially in terms of enhancing resistance to pathogens. Having tackled a heterozygous pinot noir cultivar of the grape *Vitis vinifera*, Velasco *et al.* have produced a draft of the genome sequence (estimated to be 82% complete) and uncovered a large-scale partial genome duplication of 10 chromosomes. In addition, they found that homologous chromosomes differed by approximately 11.2% and mapped approximately 2 million single-nucleotide polymorphisms. Analyses of duplication events within the grape genome suggest that the majority of gene duplication is *Vitis*-specific and not due to an earlier rosid duplication, as has been postulated. These genomic resources will support further investigation of grape genetics as applied to secondary metabolites (volatiles) and winemaking, and to the pathogen resistance of long-lived perennials, as well as adding to our understanding of genome evolution in the rosids, which include the already-sequenced poplar and *Arabidopsis*. — LMZ

PLoS ONE 2, e1326 (2007).

IMMUNOLOGY

The First Sign of Defense

Soon after birth, the intestine is exposed to multiple bacterial species, as its colonization by microflora begins. Some of the new immigrants are pathogenic, yet it is not clear how early innate immune protection and the initial maintenance of the normal microbiota are achieved. In particular, the antimicrobial peptide-producing Paneth cells only develop some time after the initial neonatal period, raising the possibility that the neonatal intestine may harbor another means of defense.

In support of this, Ménard *et al.* observed that although established enteric antimicrobial peptides were absent from the neonatal intestinal epithelium, they increased over time. In contrast, expression of the active, processed form of the cathelicidin cathelin-related antimicrobial peptide (CRAMP) was prominent specifically in the early stages of development in the epithelium of the small intestine. This peptide showed significant activity against a bacterial pathogen, as well

as against commensal bacteria, and its importance for neonatal protection was confirmed using infection of mice deficient in CRAMP. Expression of the peptide diminished postnatally, corresponding with a gradual proliferative replacement of the epithelia, rather than with a down-regulation of transcriptional activity. The results suggest that the newborn intestine uses an ongoing developmental program to help establish control of microbial colonization and infection early on. — SJS

J. Exp. Med. 205,
10.1084/jem.20071022 (2008).

CHEMISTRY

Mild Metal Mixing

Combining a second metal with platinum (Pt) to form an intermetallic can reduce costs, inhibit poisoning, and in certain cases improve the reactivity of this widely used catalyst. However,

the need for particle annealing at high temperature causes sintering that reduces the particle surface area and introduces shape and size distortions. Bauer *et al.* present a milder technique whereby Pt nanoparticles synthesized with specific shape and size dispersity are treated in low-temperature solution with metal salts to form Pt-M intermetallics (M can be tin, lead, or several other metals). When stabilized by growth on a support such as alumina or ceria, the Pt particles did not aggregate. In the case of PtPb particles supported on Vulcan XC-72, a conductive carbon black pigment, the electrocatalytic oxidation of formic acid occurred at a lower onset potential in comparison with commercial PtRu particles on the same support. — MSL

J. Mater. Chem. 18, 275 (2008).

CLIMATE SCIENCE

Whither Antarctic Ice?

Determining how much the Antarctic ice sheet may contribute to sea-level rise through global warming depends on an accurate and precise understanding of the mass balance of two broadly defined regions: the coast and the interior. Essentially, the coasts appear to be losing mass while the interior is closer to being in balance, but considerable uncertainty remains in current estimates of mass change for the ice sheet as a whole. In order to better constrain the coastal element of the problem, Rignot *et al.* have analyzed satellite interferometric synthetic-aperture radar observations of Antarctica's coastline from 1992 to 2006 to estimate ice flux to the oceans. These measurements, which cover 85% of the coast, show that

although East Antarctica probably is not losing mass, widespread losses in West Antarctica totaling 132 ± 60 Gt occurred in 2006, and that ice losses that year at the northern tip of the Antarctic Peninsula amounted to 60 ± 46 Gt. Ice mass loss from the coasts increased by 75% over the period of the



Antarctica.

study. These results highlight the importance of changes in glacier dynamics, which are so poorly understood that the Intergovernmental Panel on Climate Change could not include them in projections of sea-level rise in its 2007 report. — HJS

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