**Bacterial symbionts mediate parasite resistance in aphids**

Kerry Oliver et al. demonstrate that the bacterial symbiont *Hamiltonella defensa*, and not host genotype, determines the level of parasite resistance in pea aphids (*Acyrthosiphon pisum*). Pea aphids are targets of the parasitic wasp *Aphidius ervi*; female wasps lay their eggs inside live aphids, and newly hatched larvae begin feeding on the aphid host. Aphid populations can exhibit varying degrees of resistance to these parasitic attacks, but the relative contributions of symbiont isolate, host genotype, or an interaction between the two are unknown. Oliver et al. examined symbiont contribution by infecting aphid clones of the same genetic background with one of five *H. defensa* isolates, one of which was obtained from *Aphis craccivora*, another aphid species. All five isolates provided some level of parasite resistance, judged by counting the number of surviving aphids, with levels ranging from 19% to nearly 100%. In contrast, when five genetically different aphid clones were each infected with the same *H. defensa* isolate, all five showed similar resistance levels, ~40%. These results suggest that symbiont-mediated parasite resistance is a general phenomenon among *A. pisum*, and therefore a major mode of adaptation to predatory pressures. — N.Z.

“Variation in resistance to parasitism in aphids is due to symbionts not host genotype” by Kerry M. Oliver, Nancy A. Moran, and Martha S. Hunter (see pages 12795–12800)

**Jocote tree shows multiple origins of domestication**

Investigating the domestication of the jocote tree (*Spondias purpurea*) in Mesoamerica, Allison Miller and Barbara Schaal provide phylogeographic evidence of multiple domestications of this fruit tree. The authors collected samples from both wild and cultivated *S. purpurea*, and related *Spondias* species, from 11 geographic regions in Mexico and Central America. Using chloroplast sequence data, Miller and Schaal confirmed that wild populations of *S. purpurea* were the likely progenitors of cultivated jocote trees. Haplotypes detected in *S. purpurea* were found to form two geographical clusters, with one cluster spanning the region of southern Mexico and Central America and the other group arising from western Central Mexico. Each of the clusters included haplotypes found in both cultivated and wild trees, though five haplotypes were found exclusively in cultivated trees. The presence of unique alleles in cultivation may be a result of modern extinction of Mesoamerica’s tropical dry forests, the authors say. These findings also indicate that some agricultural habitats may serve as reservoirs of genetic variation in *S. purpurea*. — N.Z.

“Domestication of a Mesoamerican cultivated fruit tree, *Spondias purpurea*” by Allison Miller and Barbara Schaal (see pages 12801–12806)

**MEDICAL SCIENCES**

**Human bocavirus in lower respiratory tract infections**

Tobias Allander et al. report the identification of a unique virus, provisionally named human bocavirus (HBoV), associated with lower respiratory tract infection (LRTI). LRTI, the leading cause of hospitalization among children and infants, can arise from a number of viruses, but 12–39% of cases have unknown etiology. To determine whether an unidentified virus contributes to LRTI, Allander et al. amplified and sequenced viral DNA within pooled respiratory tract samples from hospital patients in Sweden. Seven virus species were detected, including HBoV, a species of the genus bocavirus in the family Paroviridae. PCR screening of culture-negative nasopharyngeal aspirates showed that all HBoV-positive samples originated from infants and children. To investigate whether HBoV is directly associated with respiratory infections, the researchers tested 540
respiratory tract samples collected from a pediatric infectious disease ward and found that 17 children with LRTI were positive for HBoV. Furthermore, HBoV was detected primarily in samples negative for other viruses, suggesting that HBoV is a likely etiologic agent of LRTI. The authors also suggest that this large-scale, culture-independent screening method may be used to identify viruses responsible for diseases of unknown origin. — L.B.

“Cloning of a human parvovirus by molecular screening of respiratory tract samples” by Tobias Allander, Martti T. Tammi, Margareta Eriksson, Annelie Bjerkner, Annika Tiveljung Lindell, and Björn Andersson (see pages 12891–12896)

NEUROSCIENCE

N-cadherin in Drosophila photoreceptor development

Aljoscha Nern et al. have identified an allele of the cell adhesion molecule N-cadherin that disrupts the connections of photoreceptor neurons in Drosophila. Previous research has shown that N-cadherin, which has 12 isoforms, is necessary for assembly of the embryonic CNS, dendritic patterning of the olfactory system, and targeting of photoreceptor neurons (R cells). In mutant screens, Nern et al. found an allele of N-cadherin with a point mutation, N-cad18Astop. N-cad18Astop R7 photoreceptor neurons frequently targeted to an incorrect layer during pupal development. To assess when N-cadherin 18A-containing isoforms were required, the authors analyzed the R7 phenotypes of N-cad18Astop mutants at 35% and 48% of development after pupal formation. All of the mutant R7 growth cones remained in the correct layer at both stages, but the neurons ultimately retracted to the incorrect layer. The requirement for the 18A isoform in R7 target layer selection reflected a difference in isoform expression patterns during pupal development rather than in intrinsic, biochemical functions between isoforms. — F.A.

“An isoform-specific allele of Drosophila N-cadherin disrupts a late step of R7 targeting” by Aljoscha Nern, Louis Nguyen, Tory Herman, Saurabh Prakash, Thomas R. Clandinin, and S. Lawrence Zipursky (see pages 12944–12949)

PLANT BIOLOGY

Defense role of plant cell wall peptides

Javier Narváez-Vásquez et al. present evidence suggesting that the plant cell wall may play an active role as a source of peptide signals for defense. Previous studies isolated three hydroxyproline-rich glycopeptides (LeHypSys I, II, and III) from tomato leaves (Lycopersicon esculentum) that act as powerful activators of the octadecanoid defense pathway. Narváez-Vásquez et al. showed that the single proprotein precursor of these glycopeptides, preproLeHypSys, is synthesized in the phloem parenchyma cells of the vascular bundles in response to elicitors, such as wounding or the signaling molecules systemin and methyl jasmonate. In the leaves of wounded tomato plants, prosystemin-overexpressing plants, and methyl jasmonate-treated plants, the accumulation of preproLeHypSys was found to be in the cell wall matrix. This localization indicates that the defense-signaling peptides may result from regulated processing events that occur in the cell wall matrix in response to trauma, and may be among the plant’s earliest events in response to pest and pathogen attacks. — R.N.

“The plant cell wall matrix harbors a precursor of defense signaling peptides” by Javier Narváez-Vásquez, Gregory Pearce, and Clarence A. Ryan (see pages 12974–12977)

Epidermal cell walls of tomato plants expressing proLeHypSys.