Wurmlab
Community: Journal table of contents highlights
published between 1st and last day of **FEBRUARY (in print *and* early access). **Finish it by March 12th**. Please add everything as nested bullet-points.
CTRL-K for links
CTRL-SHIFT-V paste w/o format

Look at the table of content duties here (github)

- **Am Nat**
  - The Behavior and Reproductive Physiology of a Solitary Progressive Provisioning Vespid Wasp: Evidence for a Solitary-Cycle Origin of Reproductive Castes The authors find that a solitary *Synagris* wasp "may possess traits that were likely present in a solitary ancestor of social vespids". However, in the study population interactions between females were never observed. Despite this, a link is observed between the ovarian growth cycle & maternal behaviours which can be equated with caste-like division of labour.
- **Bioinformatics**
  - findGSE: estimating genome size variation within human and Arabidopsis using k-mer frequencies
  - MutaNET: a tool for automated analysis of genomic mutations in gene regulatory networks.
- **Cell**

- **Current Biology**
  - Single-Parent Expression Is a General Mechanism Driving Extensive Complementation of Non-syntenic Genes in Maize Hybrids Baldauf et al https://doi.org/10.1016/j.cub.2017.12.027 RNAseq of hybrid and inbred parent lines at 3 developmental stages, 4 - 12 biological replicates. MDS on results. Complementation in hybrid because genes expressed in only one of the parental inbred lines.
  - Rampant Host Switching Shaped the Termite Gut Microbiome Bourguignon et al https://doi.org/10.1016/j.cub.2018.01.035 94 species, 16S RNA barcoding, 211 bacterial lineages. A combination of niche specialisation (horizontal transfer between termite guts) and more generalised lineages (found also in other taxa).
  - Spatial Receptive Fields for Odor Localization
  - Hidden Complexity of Yeast Adaptation under Simple Evolutionary Conditions

- **eLife**
  - RNA-dependent RNA targeting by CRISPR-Cas9 Cas9 enzymes from both subtypes II-A and II-C are shown to recognize and cleave single-stranded RNA. The researchers were also able to confer protection to *E. coli* against an RNA bacteriophage.
  - Automated cell-type classification in intact tissues by single-cell molecular profiling The authors have developed a microscopy technique that allows them to stain and tag cells that measure the location & signals of cell groups at the same time.
- **Evolution**
  - Repeated evolution and reversibility of self-fertilization in the volvocine green algae Ancestral-state reconstructions show that self-fertilization has repeatedly evolved from outcrossing ancestors and that multiple reversals have occurred. self-fertilization is not restricted to the tips of the phylogenetic tree, a finding inconsistent with the view of self-fertilization as a dead-end strategy. no evidence for higher extinction rates or lower speciation rates in selfing lineages. We find that self-fertilizing species have significantly larger colonies than outcrossing species, suggesting the benefits of selfing may counteract the costs of increased size. the haploid-dominant life cycle may alter the costs and benefits of selfing.
  - A species-specific multigene family mediates differential sperm displacement in *Drosophila melanogaster* (pages 399–403). A young gene: compared doubly mated females, second mated to either *Sdic* knockout or nonknockout males, and directly visualize sperm dynamics in the female reproductive tract.
  - The genetics of egg retention and fertilization success in *Drosophila*: One step closer to understanding the transition from facultative to obligate viviparity. DGRP lines - egg staining in each -> Gwas.

    - Antagonistic pleiotropy and mutation accumulation contribute to age-related decline in stress response (pages 303–317). DGRP association mapping approach to investigate the change in additive effects of SNPs across age and among traits for multiple stress-response fitness-related traits, including cold stress with and without acclimation and starvation resistance.

- **GBE**
    - Genome Sequencing of Museum Specimens Reveals Rapid Changes in the Genetic Composition of Honey Bees in California A whole-genome based study of the contributions of European and African honey bee populations to introduced (feral and managed) Californian bees over a 105 year period (1910–2015) & identified three main geographically and genetically distinct groups. The study found that southern-Californian populations had higher genetic diversity than the other groups.
    - Illumina Library Preparation for Sequencing the GC-Rich Fraction of Heterogeneous Genomic DNA A protocol to enrich sheared genomic DNA in its GC-rich fraction by subtracting AT-rich DNA. This was achieved by heating DNA up to 90 °C before applying Illumina library preparation. The results improved on those using Taq polymerase & increased the average coverage of the GC-richest chromosomes by a factor of up to 6.
- **Genome Biol**
    - Whole-Genome Sequencing of African Dogs Provides Insights into Adaptations against Tropical Parasites

- **Genome Res**
    - MinION-based long-read sequencing and assembly extends the Caenorhabditis elegans reference genome. The authors managed to assemble the Genome of *C.elegans* using a single run of a MinION flow cell and Illumina short reads, achieving a 99.8% nucleotide accuracy compared to the reference assembly. DOI: 10.1101/gr.221184.117

- **Insectes Sociaux**
    - Complexity of searching movement in the European harvester ant *Messor wasmanni*: effect of temperature and body size
    - **From inside to outside and back again: changing waste dump formation, defecation and worker localization in a clonal ant** Abel Bernadou, Juergen Heinze. *Platythyrea punctata*. Single-age groups of young intranidal, old intranidal and forager workers. Such artificial colonies had strong differences in behavior: Intranidal workers rapidly created well-formed waste dumps (middens) and defecated within the nest, initiated egg laying sooner, and remained mostly inside the nest. Forager workers showed the reverse pattern. However, the behavior of the groups converged after 8 weeks.
- **Journal of Evolutionary Biology**
    - Experimental manipulation of population-level MHC diversity controls pathogen virulence evolution in *Mus musculus* (pages 314–322) Potts.
    - Women's attractiveness is linked to expected age at menopause. “As age at menopause is heritable, we used the mother's age at menopause as a proxy for her daughter's expected age of menopause. men judged faces of women with a later expected age at menopause as more attractive than those of women with an earlier expected age at menopause. This holds when age, cues of immediate fertility and facial ageing were controlled for. Expected age at menopause was not correlated with any of the other variables considered”

- **MBE**
    - Effects of Demographic History on the Detection of Recombination Hotspots from Linkage Disequilibrium Dapper and Payseur https://doi.org/10.1093/molbev/msx272 - In simulations, demographic history creates patterns that are detected as recombination hotspots (though they are not), so that in reality, the heterogeneity in the hotpots across species may have been overestimated.

- **Mol Ecol**
    - Can social partnerships influence the microbiome? Insights from ant farmers and their trophobiont mutualists

- **Myrmecological News**

- Subterranean ants: summary and perspectives on field sampling methods, with notes on diversity and ecology (Hymenoptera: Formicidae) Literature review of subterranean ant species taxonomy, ecology and sampling methodologies. The authors propose a standardised sampling approach using Winkler bag extractions, & call for development of new technologies to explore this area further.

- Sociometry of *Solenopsis geminata* (Hymenoptera: Formicidae) reveals variation in colony-level phenotypes in fire ants This study tests how colony-level phenotypes vary within *S. geminata* by measuring the composition of colonies over a wide range of sizes at multiple times throughout the year. Colony composition varies strongly with colony size - as colonies grow they produce increasingly large workers as well as queens & males. The study confirms monogyny and polygyny of this species in Costa Rica but suggests that because of continuous variation that it is "inconsistent with the dimorphic variation observed in *S. invicta*".

- Ant-mediated (Hymenoptera: Formicidae) biological control of the coffee berry borer: diversity, ecological complexity, and conservation biocontrol Ants antagonize and predate Coffee Berry Borer, reduce CBB infestation, and contribute to the suppression of CBB populations. However, further research is required into shade-effects & vegetation heterogeneity to completely unravel this association.

- **Nature**
  - Cognitive performance is linked to group size and affects fitness in Australian magpies "Here we show that in wild, cooperatively breeding Australian magpies, individuals that live in large groups show increased cognitive performance, which is linked to increased reproductive success." doi:10.1038/nature25503
  - Enhancer redundancy provides phenotypic robustness in mammalian development We used genome editing to create 23 mouse deletion lines and inter-crosses, including both single and combinatorial enhancer deletions at seven distinct loci required for limb development. Unexpectedly, none of the ten deletions of individual enhancers caused noticeable changes in limb morphology.
  - The axolotl genome and the evolution of key tissue formation regulators "The axolotl genome assembly does not contain the essential developmental gene Pax3. [which may account for remarkable regeneration seen in the species]"

- **Nature Comms**
  - High contiguity Arabidopsis thaliana genome assembly with a single nanopore flow cell
  - Advancing behavioural genomics by considering timescale. What are architectures underlying manners of handling environmental changes? Do these depend on how rapidly environment changes?
  - A naturally occurring epiallele associates with leaf senescence and local climate adaptation DNA methylation of a transposon correlates with local climates.
  - Gene-by-environment interactions in urban populations modulate risk phenotypes. Environment is stronger than genetics in determining health outcomes.
  - Localization of adaptive variants in human genomes using averaged one-dependence estimation probabilistic method that detects selective sweeps by learning the distributions of multiple selection statistics under different evolutionary scenarios and calculating the posterior probability of a sweep at each genomic site. SWIF(r) is trained using simulations from a user-specified demographic model and explicitly models the joint distributions of selection statistics to identify regions undergoing sweeps and localize adaptive mutations.
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- **Nature Genetics**
  - Genetic analysis of quantitative traits in the Japanese population links cell types to complex human diseases

  - Reconstructing an African haploid genome from the 18th century Here, we reconstruct the genome of Hans Jonatan (HJ), born in the Caribbean in 1784 [...]. HJ migrated to Iceland in 1802, married and had two children. We genotyped 182 of his 788 descendants [...]

    - The human noncoding genome defined by genetic diversity Craig Venter and Co. doi:10.1038/s41588-018-0062-7 " We used the power of 11,257 whole-genome sequences and 16,384 heptamers (7-nt motifs) to build a map of sequence constraint for the human species. This build differed substantially from traditional maps of interspecies conservation and identified regulatory elements among the most constrained regions of the genome."

- **Plos Biol**
    - Empirical evidence that metabolic theory describes the temperature dependency of within-host parasite dynamics Using experimental data from *Daphnia magna* and a microsporidian parasite, we fitted a mechanistic model of the within-host parasite population dynamics. The model effectively predicts host survival, parasite growth, and the cost of infection across temperature while using less than half the parameters compared to modeling temperatures discretely.

- **Plos Comp Biol**
    - The development and application of bioinformatics core competencies to improve bioinformatics training and education. Describes components of a Bioinformatics curriculum and how the different components apply to researcher, engineer, lab technician, etc.
    - A phylogenetic method to perform genome-wide association studies in microbes that accounts for population structure and recombination
    - History dependence in insect flight decisions during odor tracking.
- **Plos Genet**
    - Genome-wide association across Saccharomyces cerevisiae strains reveals substantial variation in underlying gene requirements for toxin tolerance Sardi et al https://doi.org/10.1371/journal.pgen.1007217
    - Early experiences mediate distinct adult gene expression and reproductive programs in Caenorhabditis elegans Ow et al https://doi.org/10.1371/journal.pgen.1007219
    - An efficient Bayesian meta-analysis approach for studying cross-phenotype genetic associations Arunabha Majumdar et al https://doi.org/10.1371/journal.pgen.1007139
- **PNAS**
- **Proc B**
    - Social transmission of information about a mutualist via trophallaxis in ant colonies
- **Science**
    - Aging and neurodegeneration are associated with increased mutations in single human neurons and Different mutational rates and mechanisms in human cells at pregastrulation and neurogenesis
    - Natural selection and the predictability of evolution in Timema stick insects Patrik Nosil et al.
    - Species turnover promotes the importance of bee diversity for crop pollination at regional scales
    - Structural principles that enable oligomeric small heat-shock protein paralogs to evolve distinct functions
- TREE
    - Sympatric Speciation in the Genomic Era
- Trends in Genetics
- **Other papers/tools that you feel someone should have seen:**
    - BioRxiv
        - Quantifying how constraints limit the diversity of viable routes to adaptation
    - Genetics
    - Heredity
    - Aging
    - Mol Cell Biol
    - J Gerontol
    - Methods in Ecology and Evolution
    - Current Opinion in Insect Science
    - Journal of Experimental Biology
        - Differential immune-gene expression in sperm storage organs of leaf-cutting ants
        - Antibacterial activity of male and female sperm-storage organs in ants
    - Scientific reports

        - Systematic and stochastic influences on the performance of the MinION nanopore sequencer across a range of nucleotide bias
    - Emerging topics in life sciences
        - Big knowledge from big data in functional genomics *Chris P. Ponting*
            - “Virtually all (99.85%) protein sequences have no associated experimental evidence at the protein level and for 52% their annotations are flagged as containing possible errors (www.ebi.ac.uk/uniprot/TrEMBLstats). Furthermore, scientific knowledge from targeted studies has been gained unevenly: of all human brain-expressed genes for example, science has focused on very few, with the top 5% of such genes being the subject of 70% of the literature [1]..”
            - *Information isn't power.*