



**Supplementary Figure S15. AR convergence confounded by phylogenetic relationship.** (A-C) We conducted hypergeometric tests for convergence of ARs across all non-learner terminal branches to test for enrichment of convergent acceleration. In many cases we found that convergence was much greater than expected for near relatives. Here we show three examples of this phenomenon, one from each of the three major subdivisions of birds. (A) Golden Collared Manakin (Neoaves), (B) Chicken (Galloanseres), (C) Ostrich (Paleognaths). For ease of visualization log(p) values are capped at 10. In each of these cases close relatives exhibited substantial enrichment for convergence relative to expectations from independence despite well resolved phylogenetic relationships between the species. Full results for all non-learning terminal branch comparisons are shown in Supplemental Table S8.