

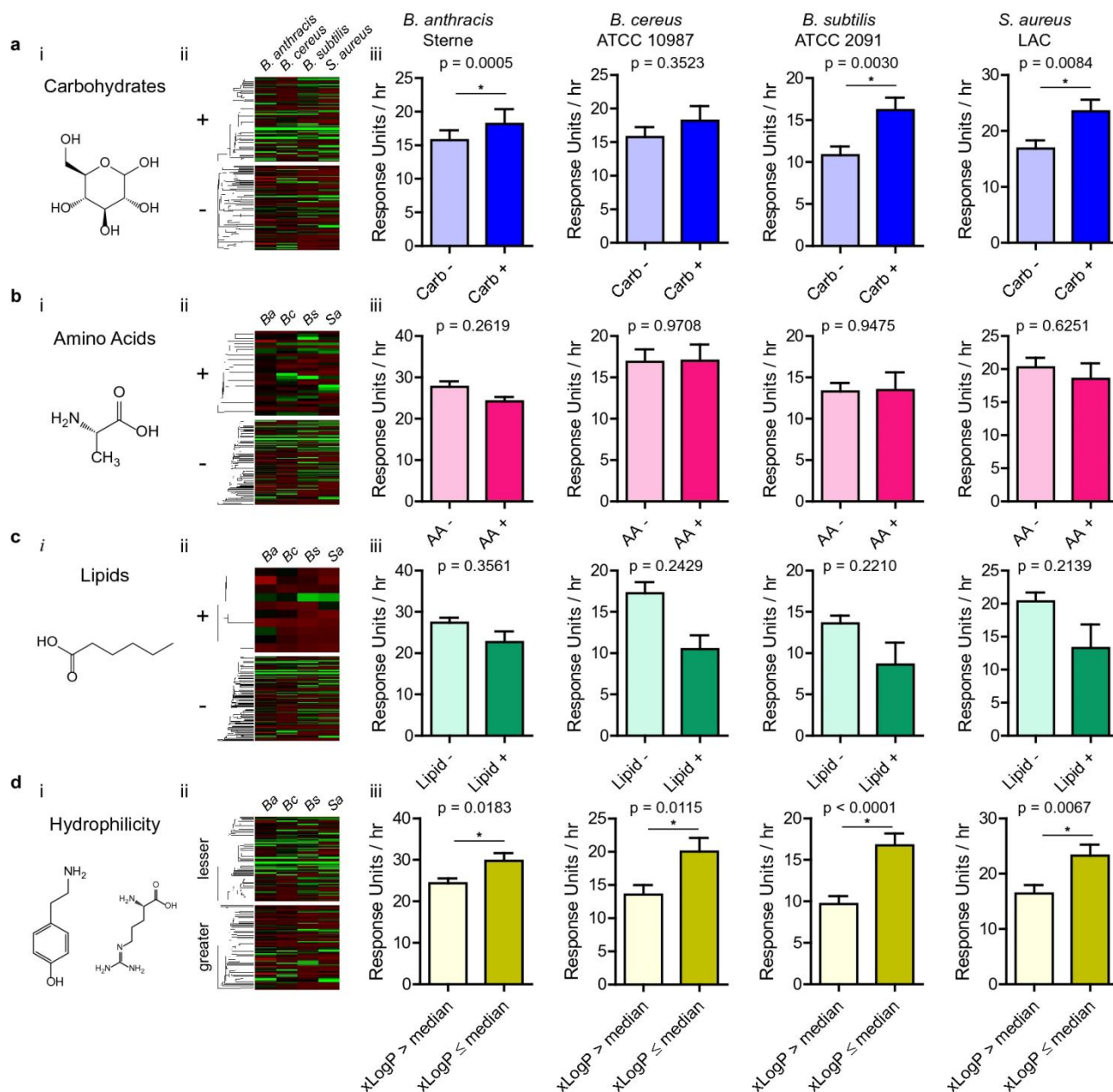


Figure 2 Metabolic rates correspond to certain chemical properties of nutrients (Adopted from Chang et al., 2020)

Image caption: (a–d) Four chemical properties of nutrients examined with the structure of an example from each category (i): (a) carbohydrates (shown: D-glucose), (b) amino acids (shown: L-alanine), (c) lipids (shown: caproic acid), and (d) hydrophilicity as represented by partition coefficient (shown: tyramine and L-arginine). (ii) Heat maps of maximum metabolic rates for nutrients with nutrients in the category for chemical property under question (+ or lesser) or did not (– or greater). Nutrients are hierarchically clustered by their chemical structural similarities using atom-pair distances. Ba: *B. anthracis*, Bc: *B. cereus*, Bs: *B. subtilis*, Sa: *S. aureus*. (iii) Average maximum metabolic rates for nutrients by chemical property (blue: carbohydrates, red: amino acids, green: lipids, yellow: hydrophilicity/partition coefficient). Bars represent averages of all nutrients categorized by chemical property. Error bars represent standard error of the mean. Maximum metabolic rate for each nutrient is an average from three independent experiments ($n = 3$, *: $p < 0.05$, unpaired Student's t-test). Figure created with R v3.5.3 (<https://www.R-project.org>) and GraphPad Prism 5 (<https://www.graphpad.com>) (Adopted from Chang et al., 2020)

7.1 Agricultural applications of Bt

Bacillus thuringiensis (Bt) has revolutionized agricultural practices through its use as a biopesticide and in genetically modified crops. Bt produces insecticidal proteins, particularly Cry proteins, which are highly effective against a variety of insect pests. These proteins have been incorporated into crops such as maize, cotton, and brinjal, providing them with inherent resistance to pests and reducing the need for chemical pesticides (Gutiérrez