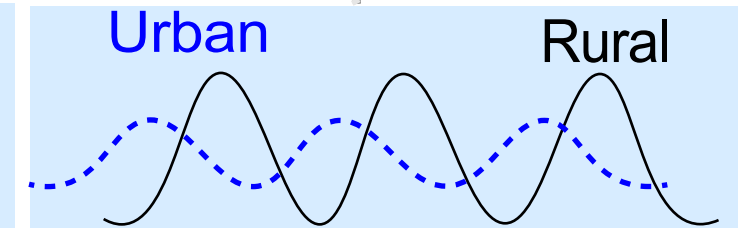
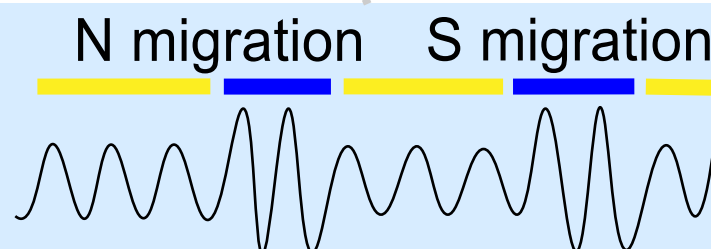
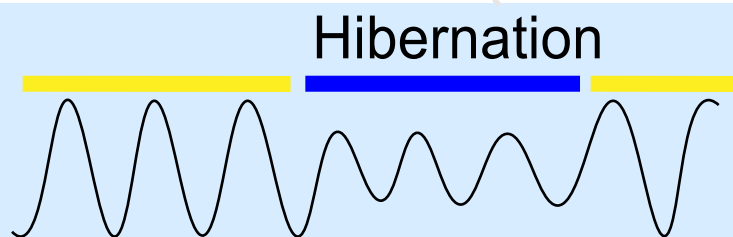
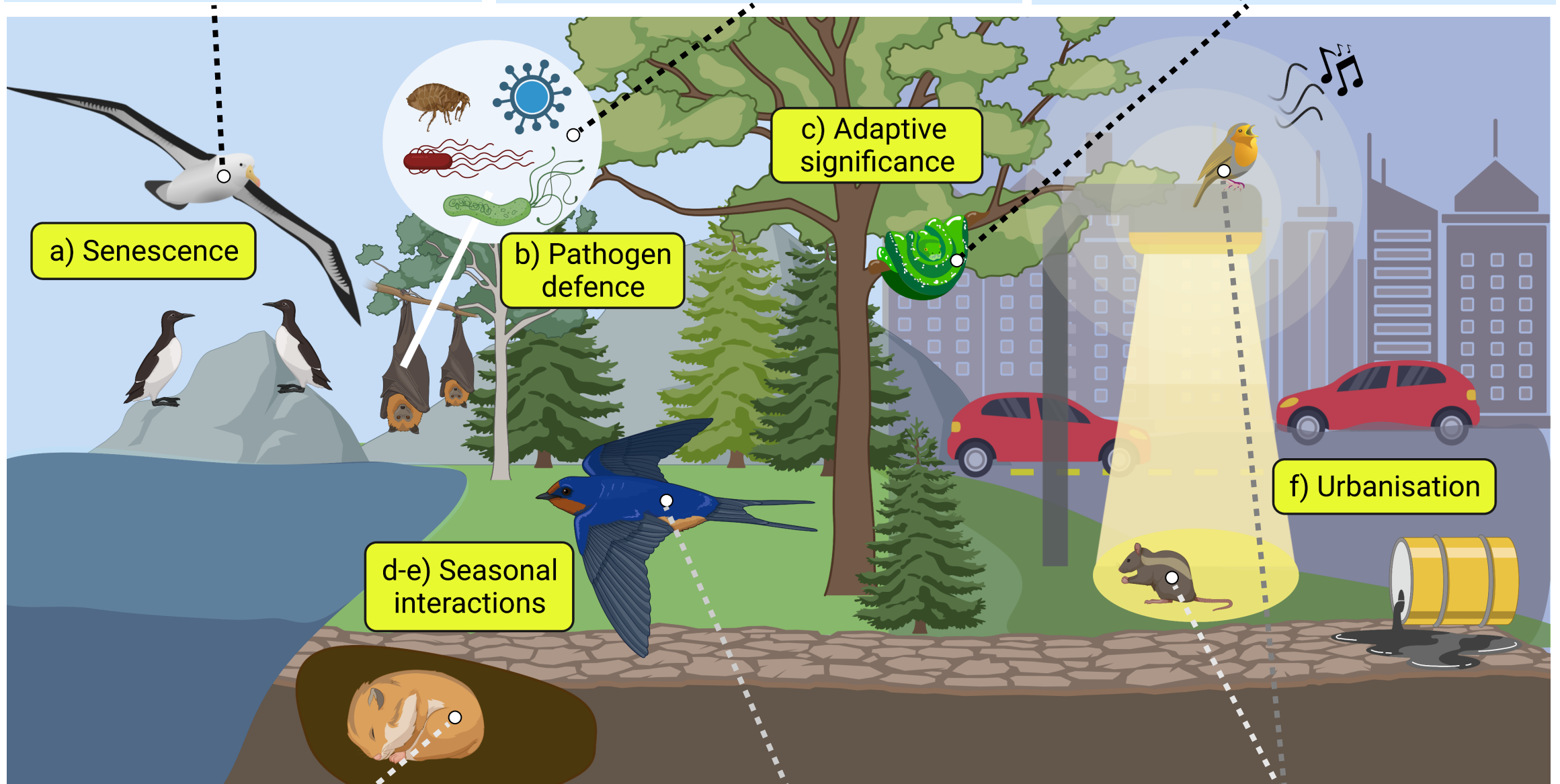
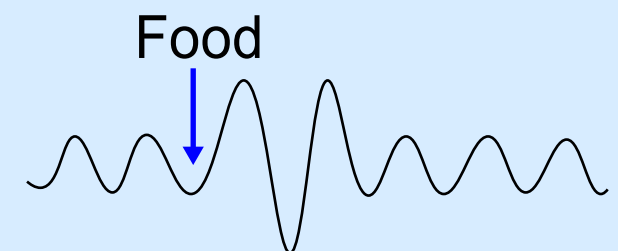
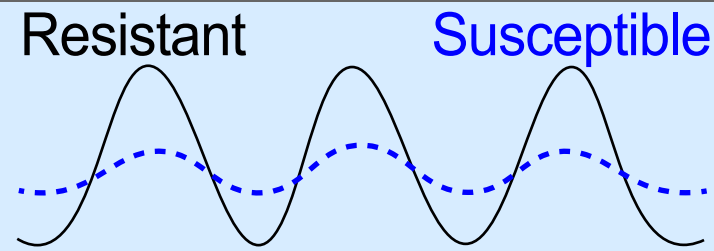
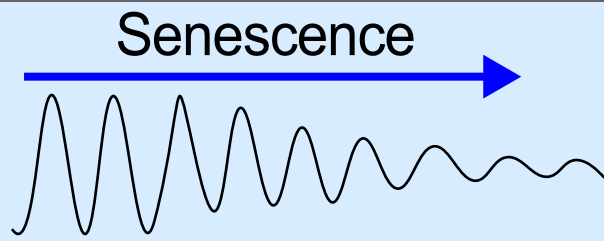


**a) Senescence:** Circadian rhythms dampen in old age. Is this reflected in gut microbial rhythms?

**b) Susceptibility:** Do disrupted gut microbial rhythms increase host susceptibility to pathogens?

**c) Adaptive significance:** How do microbial rhythms manifest in species where metabolic and immune requirements are uncoupled (e.g. snakes)?



**d) Hibernation:** How do microbial rhythms mediate seasonal switches in metabolism, e.g., during hibernation?

**e) Migration:** Are microbial rhythms disrupted or amplified during periods of intense metabolic activity, e.g., migration?

**f) Urbanisation:** Does artificial light and pollution in urban areas shift or disrupt gut microbial oscillations?