The Partnership in Education

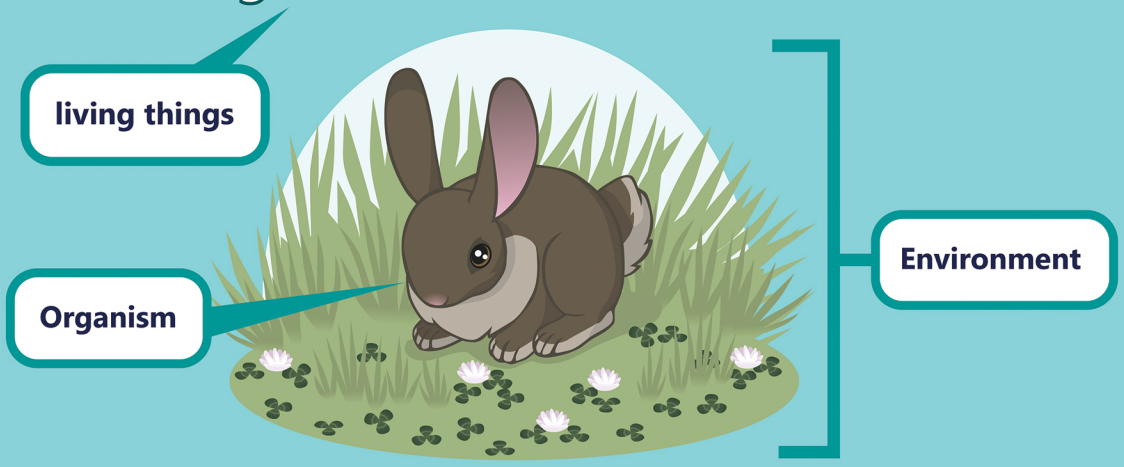
SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
Supported by the National Institutes of Health

DUQUESNE UNIVERSITY

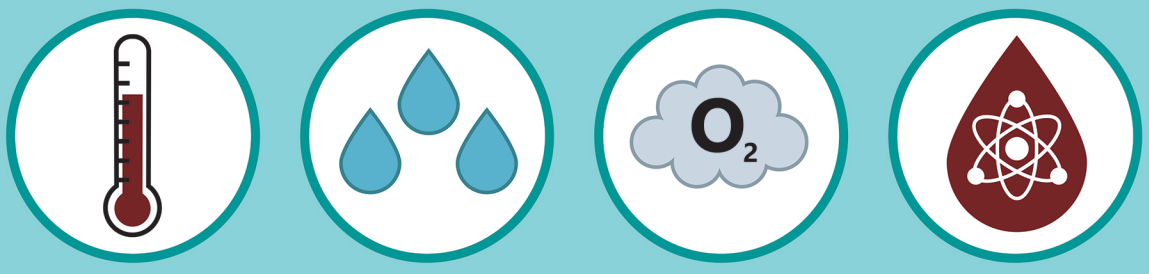
1. McEwen, B. (2017). Stress: Homeostasis, Rheostasis, Reactive Scope, Allostasis and Allostatic Load. Reference Module in Neuroscience and Biobehavioral Psychology, 1-5. doi:10.1016/b978-0-12-809324-5.02867-4

Homeostasis and Allostasis

All organisms live in an environment.



In order to survive in an environment, living things need to carry out basic bodily processes.



maintain body temperature

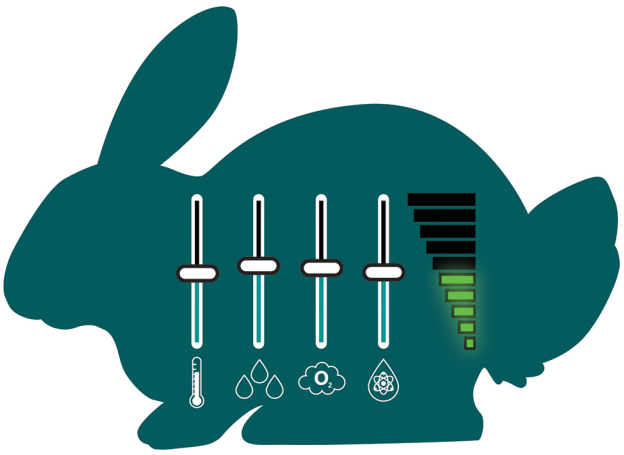
maintain hydration levels

maintain oxygenation levels

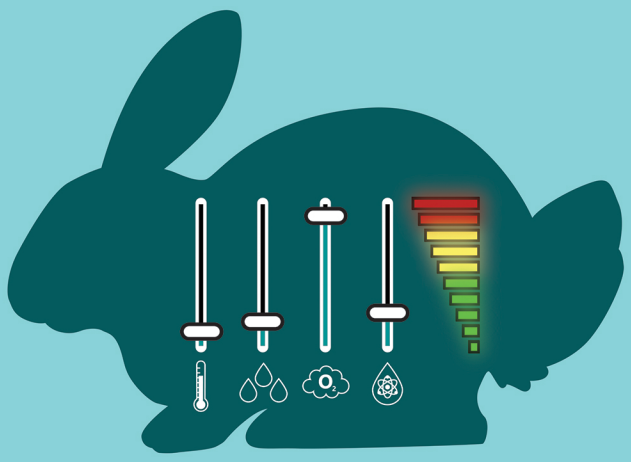
maintain blood pH

These processes have a very specific range they function under during normal circumstances to keep the organism alive.

The term homeostasis is the ability of an organism to maintain the rate of these processes and to function normally.

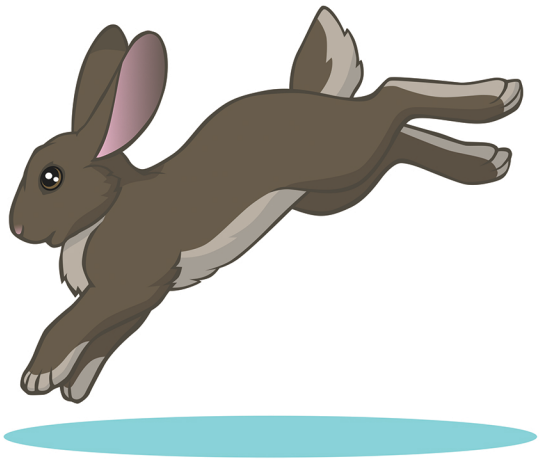


When the stress response is triggered, homeostasis is disrupted and many rapid changes occur to help the organism deal with the stressor. These changes that occur during a stressful period are known as allostasis.[1]



Short Term

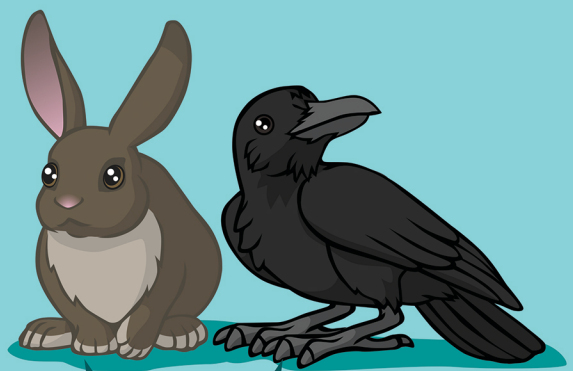
In the short term, allostasis helps organisms to protect themselves from dangerous stressors by changing the rates of bodily processes to allow the organism to defend against the threat, or to flee from it.



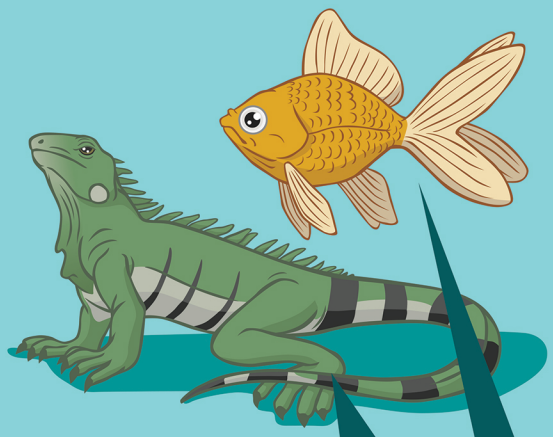
Long Term

However, if an organism is under constant stress for long periods of time, the changes to bodily processes that occur can be harmful.

Homeostasis is much more tightly controlled in warm-blooded animals such as mammals and birds, than in cold-blooded animals like fish and reptiles.



more tightly controlled



less tightly controlled