INFECTION

Quality over quantity in sepsis recovery

Owen, A.M. et al. *eLife* https://doi.org/10.7554/eLife.49920 (2019)

Sepsis, the severe result of the body's overresponse to an infection, can be life-threatening and require long stays in intensive care units (ICU) for necessary supportive care. Those who survive often find themselves left with chronic muscle weakness—few return to pre-sepsis function.

A paper in *eLife* presents a new mouse model of the syndrome's lingering after effects. The researchers adapted a previous ICU-like model to late middle-aged C57BL/6 animals. The animals lost body weight and experienced muscle wasting during the induced sepsis event but with the refined protocol, 75% of the animals survived. These animals were however left with notable muscle weakness, even as muscle mass recovered. Looking more closely at the muscle cells, the researchers observed mitochondrial abnormalities and signs of oxidative damage. Sepsis recovery might thus depend on muscle quality, not quantity. *EPN*

https://doi.org/10.1038/s41684-020-0473-9

BIOMEDICAL ENGINEERING

On pacemakers

Gutruf et al. *Nat. Commun.* **10**, 5742 (2019)

At the heart of it, the heart is controlled by electrical activity. Manipulating those patterns with pacemakers can reveal important details about cardiac diseases. However, such manipulations in small animals, such as rodents, have been hindered by the animals' small size—powering cardiac pacemakers has previously required bulky batteries, external tethering, or removal for recharging—details not conducive to studies with freely moving rodents.

A new, wirelessly powered device cuts the cord and loses the battery to provide optical and electrical cardiac stimulation in small animals. With all the electronics required, the device weighs just 110 mg and is about the size of dime. In the publication in *Nature Communications*, the team uses the device in vivo with rats and ex vivo with mouse hearts. *EPN*

https://doi.org/10.1038/s41684-020-0475-7

NEUROSCIENCE

Modeling jellyfish in motion

Pallasdies, F., Goedeke, S., Braun, W., and Memmsheimer, R. *eLife* **8**, e50084 (2019)

Connecting the activity of neurons to resulting behaviors is a goal of many neuroscientists, but nervous systems can be large and complex and behaviors nuanced and intricate. For simplicity's sake, some turn to the simplest of animals with true neurons: the jellyfish.

The distinctive swimming style of jellyfish is highly efficient and achieved with simple nerve nets that ring and radiate through the bell of the cnidarian. In work published in *eLife*, researchers from the University of Bonn present a network model that incorporates existing experimental data about the function of neurons and synapses found in the moon jellyfish, *Aurelia aurita*, to describe how the animals swim. The neuromusculature model links the neurons to the behavior, and simulations with it were able to reproduce several experimental observations. *EPN*

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OLFACTORY SYSTEM

Control that scent

Gorur-Shandilya, S., Martelli, C., Demir, M. and Emonet, T. *J. Exp. Biol.* **222**, jeb207787 (2019)

Odors in the real world are dynamic and complex, interacting with each other as well as the surfaces they encounter—all before even being picked up by the nose of a nearby animal. Studying the olfactory system that interprets odors is thus limited by how complex researchers can make the stimulant while still being in control of what they're administering.

A little mathematical modeling may help increase the complexity that can be captured in a quantitative way. Writing in *The Journal of Experimental Biology*, researchers from Yale University present a model that describes the kinetics of odor-surface interactions as well as a device that can deliver those in a more naturalistic way. The approach can't yet accommodate mixed odors, but the authors suggest the model could improve single scent delivery. *EPN*

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