



Visit us online at www.MedPageToday.com

[A](#) | [A](#) | [A](#) | [A](#)

Lab Notes: Airway Mucus Buster, Amygdala Size Matters

By MedPage Today Staff, Unit
Reviewed by
December 31, 2010

Review

A new approach to a serious complication of asthma and COPD was effective in a mouse model, and the amygdala may be the brain's hub for friend-making. All that and more in this week's Lab Notes.

Airway Goo Be Gone

A serious risk for patients with asthma and COPD is goblet cell metaplasia, in which cells in the airway lining turn into little mucus factories that make their already difficult breathing worse. Researchers at the University of Texas Medical Branch in Galveston may have hit on a way to stop the process.

Their experiments in mice suggest that aldose reductase (AR) inhibitors can block the morphing of airway epithelial cells to goblet cells. An investigational AR inhibitor called fidarestat prevented the transformation in mice with ragweed pollen-induced allergic asthma.

The research also established that one particular member of the interleukin family, IL-13, appears responsible for the cellular metamorphosis.

Fidarestat and other specific AR inhibitors are currently in development for treating diabetic complications in the eyes and nerves. Vitamin C has been found to deactivate the AR enzyme as well.

-- J.G.

Deciphering the Complement Cascade

That evolutionarily ancient innate immune system -- the complement cascade -- is yielding some of its closely held secrets, according to Dutch and U.S. researchers writing in *Science*.

Complement proteins are responsible for the removal of dying cells, be they of host or bacterial origin. When apoptotic cells are inadequately destroyed, diseases ranging from stroke to lupus can develop. How this process occurs is being studied on a

molecular level, with the goal of finding new therapeutic targets.

Led by John Lambris, PhD, of the University of Pennsylvania, the researchers analyzed the workings of two complement-enzyme complexes, C3bB and C3bBD.

X-ray crystallography showed that when factor B binds to C3b, the complex then can bind factor D, activating it. This results in rapid amplification of the cascade in the presence of a target. But because factor D is inactive before binding, it also holds the complement system in check when no target is present.

"This work offers a detailed insight into one of the most important therapeutic targets within the complement network, which may facilitate rational drug development and could lead to novel drugs for treating complement-related diseases," Lambris said in a press release.

-- N.W.

Starve a Cold, Feed a Seizure?

Mice predisposed to epilepsy were resistant to experimentally induced seizures when they ate a synthetic triglyceride that stimulates production of adenosine triphosphate.

Animals that consumed a 35% triheptanoin diet had an increased threshold for electronically and chemically induced seizures, as compared with mice fed on standard chow. The higher seizure threshold was associated with increased blood levels of principal triheptanoin metabolites.

Triheptanoin supplementation also corrected imbalances in brain-chemical metabolites hypothesized to play a role in epilepsy and other seizure disorders, investigators at Texas Tech University in Amarillo reported in the December issue of *Neurobiology of Disease*.

A component of several anti-wrinkle compounds and other cosmetics, triheptanoin also is used to treat certain enzyme deficiencies. Its anti-seizure mechanism is believed to result from a boost in cerebral stores of ATP, depletion of which may trigger seizures.

-- C.B.

Shields Up!

Researchers have discovered a mechanism that allows the parasite *Toxoplasma gondii* to survive in the hostile environment of a host's cell.

Using cell cultures and mice, researchers led by Sarah Fentress, a graduate student at Washington University in St. Louis, found that the ROP18 protein binds to and phosphorylates a class of host proteins called immunity-related GTPases. Those host proteins would normally destroy the protective membrane around the parasite, but

ROP18 disables them.

"If we can find therapies that block ROP18 and other parasite proteins like it, that could give the host the upper hand in the battle against infection," Fentress said in a statement.

However, the role of ROP18 and related proteins in human disease still needs to be studied.

"With one exception, humans don't have the same family of immunity-related GTPases," Fentress explained. "But we do have a similar group of immune recognition proteins called guanylate-binding proteins, and we are currently testing to see if ROP18 deactivates these proteins in human cells in a similar manner."

The findings were reported in *Cell Host & Microbe*.

-- T.N.

Get Specific on Babies' Ear Pain

Parents' estimations of ear ache in children too young to talk are only partially reliable, University of Pittsburgh researchers affirmed in the *Journal of Pain*.

Their study of parents presented with hypothetical symptoms in a 1-year-old with ear infection indicated that observable behaviors -- typically ear tugging and fussiness -- accounted for only half of parents' rating of pain level. Maternal education and insurance status influenced parental perception as well.

To bypass socioeconomic bias, physicians should ask parents about specific behaviors like ear tugging rather than simply the overall pain level of their preverbal child, according to the researchers.

The answers will provide a more accurate gauge to base decisions about antibiotics for acute otitis media infection, the group concluded.

-- C.P.

Now We Can Expect 'Grow Your Amygdala' Spam

The amygdala -- that small almond-shaped brain structure -- is getting a lot of play lately. A few weeks ago, researchers reported that damage to the amygdala could lead to a life [dangerously without fear](#). Now another research group suggests that an enhanced amygdala may lead to the Life of Riley.

The eponymous Riley had it all -- friends, fun, parties -- and it may have been because his amygdala was larger than average, according to researchers at Northeastern University in Boston.

In *Nature Neuroscience*, they report that amygdala volume, assessed by magnetic resonance imaging, correlated positively with the size and complexity of social networks in 58 healthy adults, where the social networks were assessed with a standardized index.

The findings are consistent with the notion that the structure evolved, at least partly, under the evolutionary pressure of "increasingly complex social life," the researchers argued.

-- M.S.

Disclaimer

The information presented in this activity is that of the authors and does not necessarily represent the views of the University of Pennsylvania School of Medicine, MedPage Today, and the commercial supporter. Specific medicines discussed in this activity may not yet be approved by the FDA for the use as indicated by the writer or reviewer. Before prescribing any medication, we advise you to review the complete prescribing information, including indications, contraindications, warnings, precautions, and adverse effects. Specific patient care decisions are the responsibility of the healthcare professional caring for the patient. Please review our Terms of Use.

© 2004-2011 MedPage Today, LLC. All Rights Reserved.