

News & Comments

Novel Sources of Bioactive Molecules*Alexis Abuhadba*

More than 14 million people die each year from bacterial infections, which continue to be one of the top causes of mortality worldwide. The prevalence of bacteria that are multi-drug resistant has been shown to cause more severe bacterial illnesses. *Enterococcus* spp., *Staphylococcus aureus*, *Klebsiella* spp., *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp. are examples of these bacteria, therefore the creation of novel antimicrobials is necessary. Antimicrobial agent production by bacteria is a defensive strategy whereby the more powerful/resistant strain can obstruct vulnerable bacteria, encouraging its own biodiversity by dominating the ecosystem, and this also acts as a signal for communication. These unique bioactive compounds may also be used as probiotics for human and animal consumption, it is believed.

The term "microbiome," first used in 2001 by Lederberg and McCray, describes the microorganisms that live inside multicellular organisms, such as plants and animals. It is recognized that the gut, which houses 70–80 percent of the immune cells of its host, has a significant impact on the host's general health. Luminal contents and microbial products are interacted with by intestinal epithelial cells, which are also able to generate anti-microbial peptides with anti-inflammatory, antibacterial, and other advantageous qualities. Additionally, the production of metabolites from dietary components or the host itself may allow the microbiota to affect immunological responses. Fish are among the most effective an amniotic ectotherm found in freshwater and marine ecosystems. They can adapt to survive in some of the harshest environments, including those with high concentrations of hydrogen sulphide.

However, there are not many studies looking at the impacts of gut microbial metabolites. Recent research has looked at the effectiveness of bacterial metabolites derived from the gut microbiota of turtle, water monitor lizard, and python. The findings showed that all bacteria except *E. fergusonii* had antibacterial effects against *S. pyogenes* and *P. aeruginosa*, whereas the metabolites from *C. freundii*, *C. braakii*, *P. mirabilis*, and *E. fergusonii* had substantial antibacterial activity against MRSA. Understanding of the avian microbiome is better than that of other non-mammalian vertebrates, however most avian microbiome reports have concentrated on commercially significant species, such chicken and turkey. Cell-free supernatant (CFS) from *Enterococcus faecium* KQ 2.6, a strain that was isolated from the faecal matter of *Pavo cristatus* (peacock) was assessed against a plethora of pathogenic bacteria.

In the past, important antibiotics and antifungals were discovered and obtained from soil microbes. There is a pressing need to find novel compounds because antimicrobials are overused and being developed less and less. Numerous species have compounds with the potential to be antimicrobial, according to recent studies. Accordingly, the gut microbiome of fish, reptiles, birds, amphibians, and



invertebrates may create compounds that have antibacterial activity against other bacterial strains, but their exact identity and mode of action are yet unknown, thus mechanistic investigations are necessary.

Source: [Veterinary Sciences](#)

KEYWORDS

Predictive modeling; inter-pathologist agreement; glass slides; whole-slide images; bladder disease; concurrence; canine; feline; veterinary pathology

