## **in**sights

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## Unlocking disease-fighting secrets

N BIOMEDICAL RESEARCH, the zebrafish is used as a model organism because it has many biological traits that mimic those of humans. However, a greater understanding of the differences in their immunity systems could one day lead to therapies to better fight human disease.

With a five-year, \$1.4 million grant from the National Institutes of Health, University of Maine microbiologist Carol Kim will conduct a comparative immunology study to shed light on the distinctions that evolved in the innate immunity systems of zebrafish and mammals, such as mice and humans.

Her prediction is that identifying those unique disease-fighting molecular processes in the zebrafish will provide researchers with clues to finding similar defense mechanisms as yet unidentified in humans.

Unidentified components may be masked or maintain minor roles in the complex structure of mammals' innate immunity. But if their contributions to the body's immunity system were

boosted, the result could be a complementary approach to fighting infectious disease.

The research could open the possibilities for new vaccines.

"Unlocking the secrets of the innate immune response is so promising, companies are now trying to use Toll-like receptor (TLR) signal pathways (proteins found on the surface of certain cells) and receptors as adjuvants for vaccines, all in an effort to achieve a more robust immune response," says Kim, the new director of UMaine's Graduate School of Biomedical Sciences.

While adaptive immunity remains essential to the existence of many species, researchers now know that the stronger the innate immune response, the more vigorous the adapted immune response.