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## INVESTIGATING ORIGINS

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### “Hopeful Monsters?”

Lateral gene transfer has been discussed several times previously in this column. This phenomenon occurs at the microscopic level, when bacteria or viruses that get inside a living organism transfer strands of their DNA to the host being. These strands then get worked into the DNA of the host, which in turns causes the host to change or mutate.

According to standard Darwinian theory, these mutations should — hopefully — confer positive changes on the individual organism that would allow it to survive and pass on the new trait to its offspring, and so on, until an entirely new, superior species comes into being. This scenario, however, has not been demonstrated by experimentation in the laboratory or by observation in the wild.

In fact, the “hopeful monster” theory has no empirical evidence supporting it. Druin Burch, a science author and a medical resident at the University of Oxford, writing in the October 2009 issue of the journal *Natural History*, comments:

“As has been pointed out many times over the years, and often in the pages of this magazine, evolution does not seem to follow a steady course. Periods of stasis sometimes last for geological stretches, and then are interrupted by short periods of great change. Recent advances in the field of evolutionary development (‘evo-devo’) show that small genetic mutations in regulator genes can have major dramatic effects, like doubling the number of wings on an insect. But the notion that such ‘hopeful monsters’ could prove adaptive is questionable, given the complexity of biochemical systems. And even if one of those new monsters successfully emerged, it might require others of a similar nature to mate with, in order for its new constellation of changes to be passed down meaningfully” (Burch 2009: 16).

This is what skeptics have pointed out ever since Darwin first posited his theory. If an insect did in fact grow a second pair of wings as the result of lateral (or “horizontal”) gene transfer from an invasive bacterium or virus, it would have to find a member of the opposite gender that had received the exact same strand of DNA from another bacterium and virus, then mate with that individual in order to pass on this newly acquired trait. The extreme unlikelihood of this happening, particularly in every species that ever existed, is one of the greatest obstacles to providing empirical, verifiable, observable evidence for Darwin’s theory.

#### Reference:

Burch, D. 2009. “The Virus Within” *Natural History* 118, no. 8.

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