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By: Gabriel Gache, Science News Editor

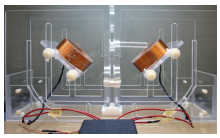

Image of the device used in the experiment
Robert Gegear

Cry Receptors Allow Flies to See Magnetic Fields

Cryptochromes identified as key components for magnetosensitivity in flies

Humans have been fascinated for centuries by the capability of migratory animals to navigate the globe, sometimes even returning to exactly the same spot from which they left, after retracing more than 15,000 kilometers. The markers that guide them in their voyage are a mystery even today, although most researchers believe that it may be possible that these animals are able to see the magnetic field generated by the Earth.But even though scientists agree that the magnetic field acts as a guide, being detected through what is known as magnetosensitivity, they still can't agree on the type of chemical compound responsible for this property. Some say that magnetite, a compound found in the brains of birds, could be the answer, while the other side believes that these animals may actually be able to see the magnetic field of the planet, although how they manage to do this remains unknown.Similar studies have been able to show that blue and ultraviolet light plays a key role in the detection of magnetic fields and animals and plants see blue light with the help of a cryptochrome protein. Therefore, the cryptochrome receptors must also be responsible for the magnetosensitivity property of animals. To test this theory, researchers from the University of Massachusetts Medical School in Worcester started conducting experiments on fruit flies, which also have cryptochrome receptors.One of the experiments consisted of a T-shaped maze, inside which a magnetic field and ultraviolet and blue light could be generated at will. Since normal fruit flies usually have cryptochrome receptors, the team also created a control group that lacked this key protein. They then observed how the two groups reacted in relation to different combinations between magnetic field and light.When put in the maze, the normal flies with cryptochrome receptors appeared to move regardless of whether or not a magnetic field was present, but when ultraviolet and blue light was applied, the flies seemed to exhibit preference towards the magnetic field lines. The control group on the other hand showed no preference at all towards the magnetic field regardless of the type of light used to illuminate the maze.The experiment did not show that indeed the respective protein is the magnetic field receptor in flies, but it proved that it plays an important role when it comes to their magnetosensitivity. "This gets us to the point where we can ask more questions," said neuroscientist Steven Reppert of the University of Massachusetts Medical School in Worcester, co-author of the study.