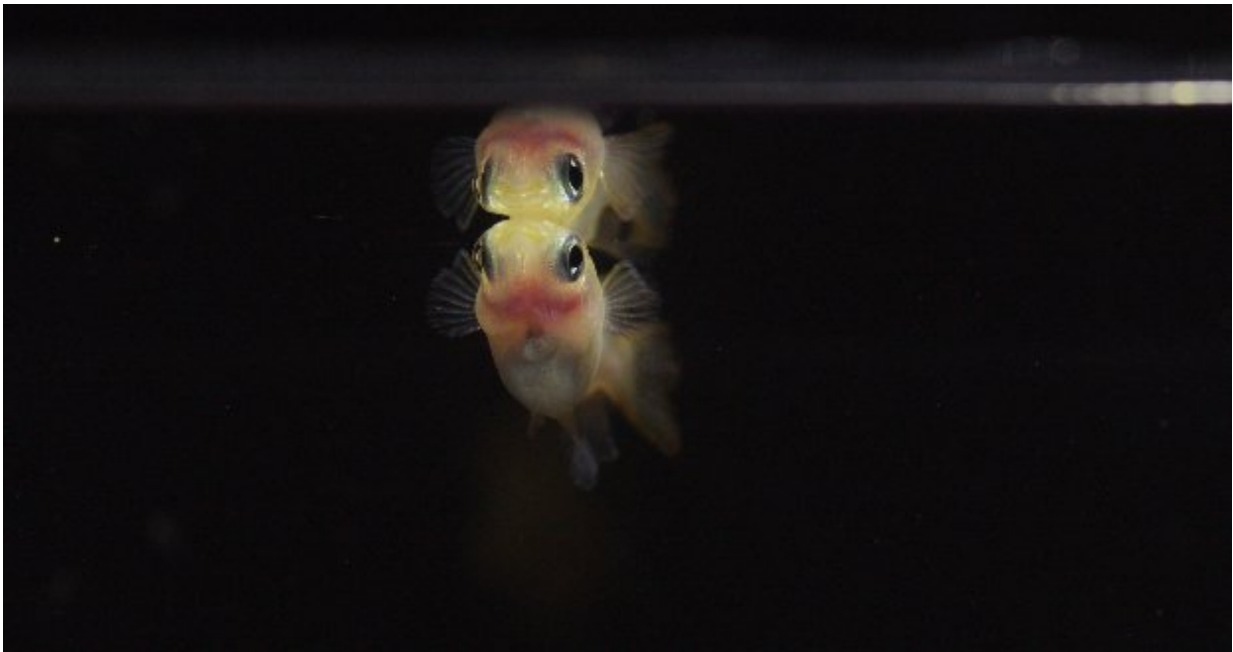


Medaka fish use faces to identify different individuals

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An illustration of right-side up and upside-down medaka fac. Credit: Eiji FUJIWARA Documentary Channel Co. Ltd.

For many animals including humans, the ability to identify different individuals among their own kind is an essential ability for everyday living. Faces are the most important body part for individual recognition in many animals, and faces are special in many ways. For example, humans and some other mammals not only look at the parts of a face (such as eyes and nose), but read the face as a whole. When we see an

upside-down face, it is more difficult to recognize it because our ability to read the face as a whole is interrupted (Face inversion effect). This special ability only occurs in faces and not in other objects.

Some [fish](#), such as medaka (also called Japanese rice fish), can identify one individual from others. For example, female medaka like the males they have seen before. However, we do not know how they distinguish a certain male among many others.

Mu-yun Wang and her colleagues (at the University of Tokyo and Okayama University) have found that medaka use faces for individual recognition, and how recognized faces may be different from non-face objects.

The researchers tested whether medaka use vision, odor or both cues to recognize mates. Moreover, the group studied which body part is used for identifying a familiar male. They also compared how fish separate two fish or two objects, in both right-side up and upside-down positions. If faces are "special" for medaka, they may not be able to recognize the upside-down faces equally well, but should show no difference between right-side up and upside-down objects.

They found that medaka use both vision and olfaction to distinguish between fish, but only vision is enough. More specifically, they use faces for individual recognition. Even when the researchers added some spots to fish faces, the fish could still recognize the face-painted fish without difficulty. Fish can discriminate between two fish faces and two objects equally well, but when the faces are upside-down, it becomes more difficult to tell them apart. When discriminating between two non-face objects, medaka can perform equally well in the right-side up and the upside-down positions. This suggests that faces might be special for fish, just as in humans.

This is the first study showing [animals](#) other than mammals may have a special ability to recognize faces. Even with their small brains, the fish can distinguish different individuals. The findings can be important to understand how animals, including humans, recognize [faces](#), and related evolutionary origins. We have a powerful genetic toolbox for medaka, thus we may be able to find the genes and neurons relative to face [recognition](#).

More information: Mu-Yun Wang et al. Individual recognition and the 'face inversion effect' in medaka fish (*Oryzias latipes*), *eLife* (2017). [DOI: 10.7554/eLife.24728](https://doi.org/10.7554/eLife.24728)

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