Transparent Head Fish

The barreleye fish has a transparent head right out of a sci-fi movie.

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The barreleye fish (Macropinna microstoma) has extremely light-sensitive eyes that can rotate within a transparent, fluid-filled shield on its head. The bright green eyes point upward (as shown here) when the fish is looking for food overhead. They point forward when the fish is feeding. The two spots above the fish's mouth are olfactory organs called nares, which are analogous to human nostrils.
(c) 2004 MBARI.The barreleye fish (Macropinna microstoma) may look like some kind of fantasy creation for a Hollywood sci-fi film, but it is very real and living in deep water off the coast of California and through the North Pacific region. Little about this species has been recorded since it was first discovered 70 years ago. Recently however, scientists from the Monterey Bay Aquarium Research Institute were able to study these fish alive in their deep water habitat for the first time. Using remotely operated vehicles (ROVs), they filmed barrelfish at depths between 2,000 and 2,600 feet.

The lights of the ROV picked up the vivid green lenses in the barrelfish's tubular eyes, as well as its two nostrils. The filming also revealed a previously unknown feature of these fish – a transparent, fragile, fluid-filled shield which extends over the top of the head. This was confirmed when the team managed to catch a barreleye, and were able to transfer it alive to an aquarium on their research vessel.

The barreleye's lifestyle is typical of an ambush predator. Its large, flat fins allow it to hold its position in the water, remaining almost motionless. The fish rests horizontally, but its eyes direct vertically, looking above its body for siphonophores, which are a colonial type of jellyfish. The green pigment in the fish's eyes may serve to filter out light from the surface, making it easier to spot the jellyfish's bioluminescence. Once it sights its target above, the barreleye rotates its eyes forward and starts to swim vertically upwards.

These particular jellyfish are like drift nets, sometimes measuring more than 33 feet, with thousands of stinging tentacles along their length which trap tiny marine creatures. It is thought that the barreleyes will steal these planktonic creatures from the jellyfish, rather than seeking to attack the jellyfish themselves, as reflected by the barreleye's small mouth.

The shield helps to protect the vulnerable top of the barreleye's head from being stung, while its maneuverable eyes enable it to focus on the tentacles in the dark and seize its quarry. It is only since the advent of deep sea vehicles equipped with cameras that scientists are now finally able to start understanding the remarkable habits of these and other fish living in the ocean's depths.