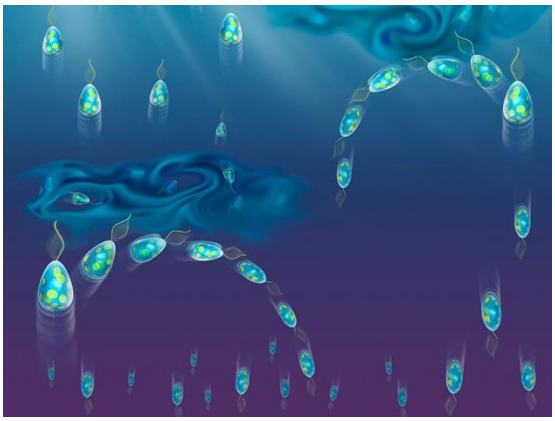
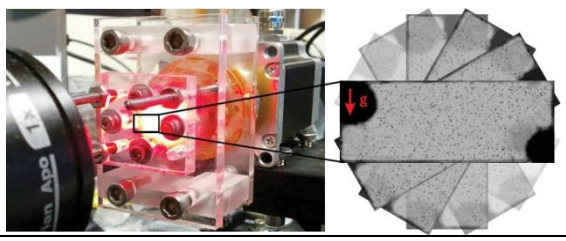
Background Information

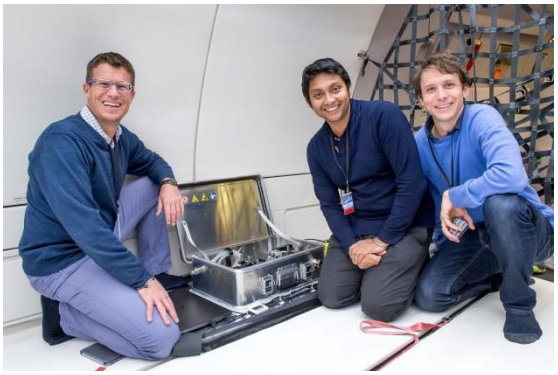
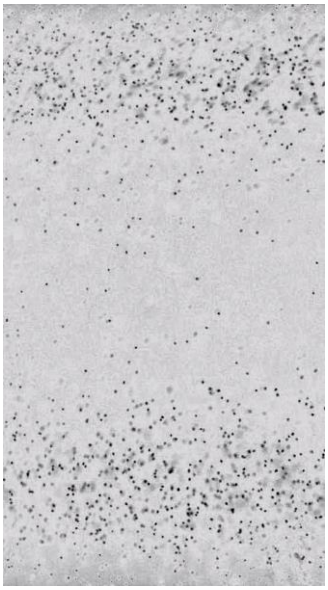
Information photographs and video footage

How plankton cope with turbulence

Zurich, 14 March 2017

The following photographs and the video footage can be downloaded free of charge on the following link: https://www.skyfish.com/sh/334561f8dcda255ea54382868f28db31c26a51ab/18480369/791992

	**Image description 1:** Algal population split into two equally sized groups when exposed to turbulence. Downward swimming cells become egg-shaped, while those swimming upwards are pear-shaped. This change of shape involves a difference of just one micrometre. © ETH Zürich
	**Image description 2:** To examine swimming behaviour, the researchers used a microfabricated chamber, just a few cubic millimetres in volume, in which they introduced the Heterosigma cells. The chamber could be rotated by 180 degrees

	along its axis using a computer-controlled motor, exposing cells to periodic flips in orientation replicating how tiny turbulent vortices flip the cells upside down in the ocean. © ETH Zürich
	**Image description 3:** Roman Stocker, Professor at the Institute of Environmental Engineering of ETH Zürich and his postdoctoral researchers Anupam Sengupta and Francesco Carrara (from left to right) describe the different swimming behaviour of marine plankton in the latest issue of the journal *Nature.* © ETH Zürich
	**Video description:** The scientists were able to observe that an algal population moving upwards split into two equally sized groups over a period of 30 minutes after the chamber was repeatedly flipped by 180 degrees. One group of cells continued to strive upwards, whereas the other group switched behaviour and began to swim in the opposite direction. The researchers argue that splitting into two groups creates an evolutionary advantage for the population: in this manner, the entire population is not lost when it encounters a layer of strong turbulence, but in the worst case, only half. © ETH Zürich