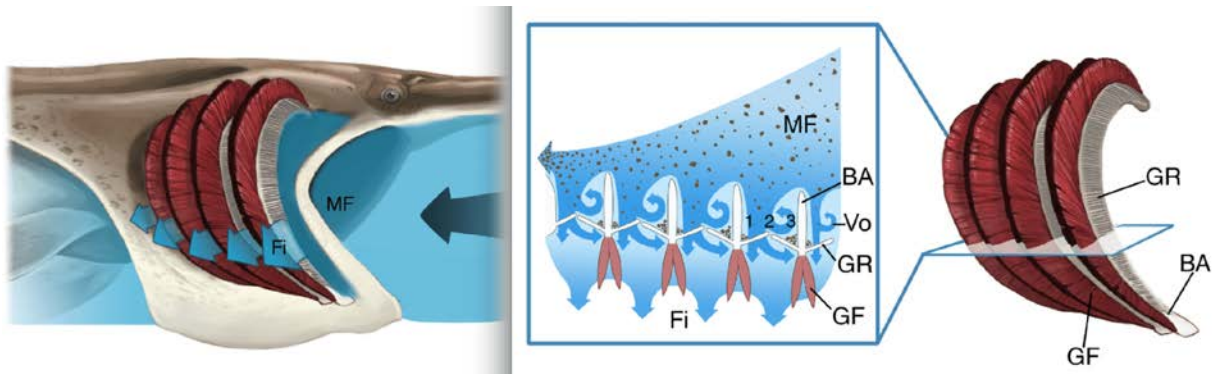


WM-1320: IMPROVED CROSS-FLOW FILTRATION

Inventors: Laurie Sanderson

Application: Improved cross-flow filtration for applications including bioprocessing, protein purification, food/beverage filtration, and fuels/chemicals, and pre-filtration

Technology Background: Dr. Sanderson has extensively studied filter-feeding fish such as goldfish and basking sharks. These fish retain prey without clogging their oral filters, whereas all industrial cross-flow filtration is ultimately subject to clogging. Dr. Sanderson has recently uncovered the technique used by these fish, which she has termed cross-step filtration, and published an [article in Nature Communications](#) very recently along with an accompanying [commentary](#), from which the image below is reproduced.



A paddlefish illustrating the new vortical cross-step filtration model, from Sanderson et al., doi: 10.1038/ncomms11092. The mainstream flow (MF) enters from the right and interacts with the series of backward-facing steps that are formed by the branchial arches (BA), causing vortical flow (Vo). The vortex interacts with the gill rakers (GR) to concentrate particles for transport towards the back of the mouth to be swallowed.

Unlike fish, industrial cross-flow systems can't periodically swallow in order to clear or transport particles, so Dr. Sanderson developed a clever technology that has shown tremendously improved filtration efficiencies, reducing particle build-up by nearly two orders of magnitude by creating vortices within slots through which particle-depleted filtrate passes. We recently received a notice of allowance for our U.S. patent with broad claims allowed.

Intellectual Property: Patent allowed.

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