

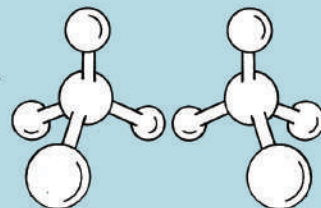
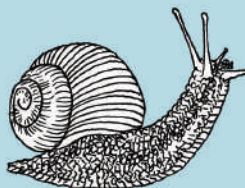
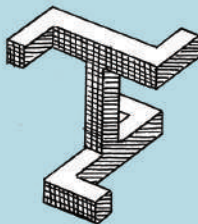
BECAUSE HIS HANDS ARE MIRROR IMAGES HE CAN'T SUPERIMPOSE THEM

IT'S A PERFECT ILLUSTRATION OF CHIRALITY!

i.e. A PARTICULAR FORM OF ASYMMETRY

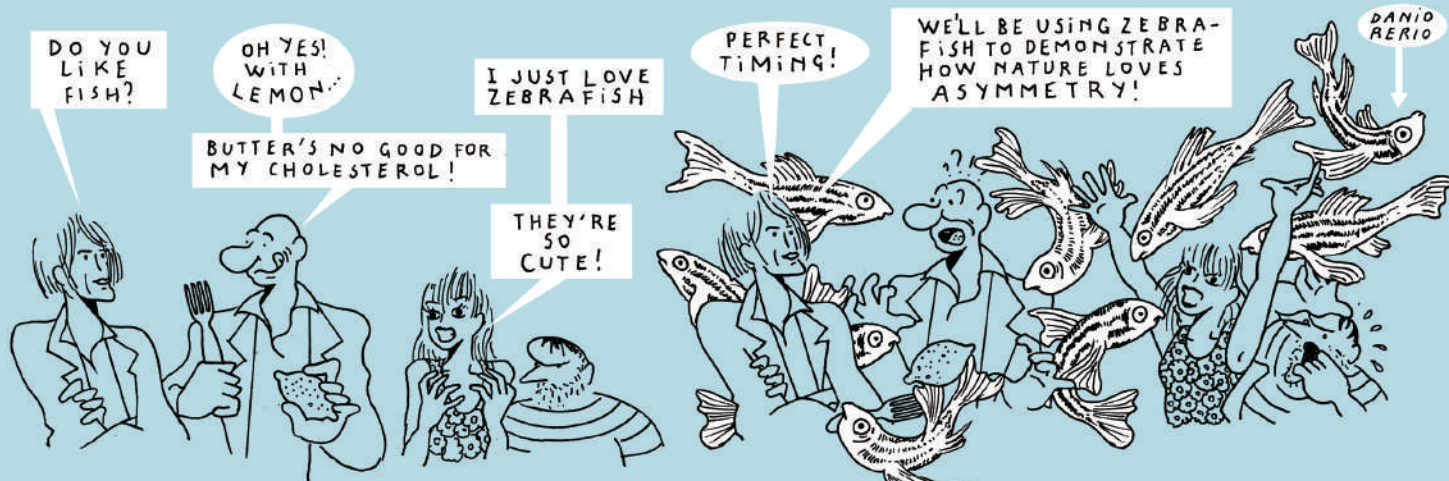
THAT EXISTS ALMOST EVERYWHERE

EVEN IN MOLECULES!



ANOTHER KIND OF HARMONY

UNCONVENTIONAL MYOSIN-1D

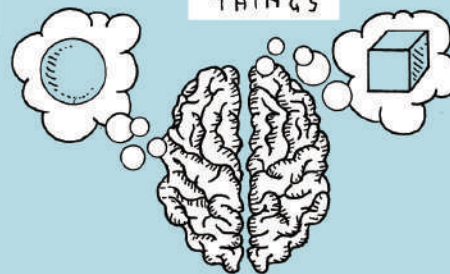
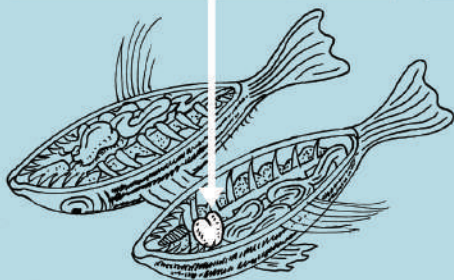


IF WE SLIT A FISH LENGTHWISE, YOU'LL NOTICE THAT ITS HEART IS LOCATED ON ONLY ONE SIDE

IF THE FISH'S SYMMETRY WERE PERFECT, ITS HEART WOULD HAVE BEEN SLICED INTO TWO IDENTICAL HALVES

THIS IS KNOWN AS ANATOMICAL ASYMMETRY

BUT YOU CAN ALSO FIND FUNCTIONAL ASYMMETRY, AS IN OUR BRAIN, FOR EXAMPLE, WHERE EITHER SIDE IS USED TO ACCOMPLISH DIFFERENT THINGS



WHICH BRINGS US TO KUPFFER'S VESICLE

OR KV..

and a wonderfully elegant hypothesis

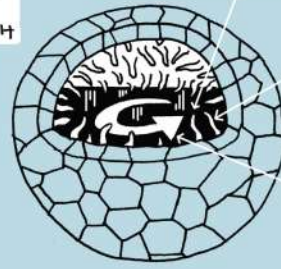
KNOWN AS LATERAL LEFT-RIGHT ASYMMETRY

KVs ARE SPHERICAL IN SHAPE, COMPOSED OF ONLY A FEW DOZEN CELLS, AND MAKE A TRANSITORY APPEARANCE AT THE VERY BEGINNING OF ZEBRAFISH EMBRYOGENESIS



THE INSIDE LUMEN IS FILLED WITH FLUID

INTO WHICH PROTRUDE CILIA



ORIENTED IN SUCH A WAY THAT THEIR BEAT CREATES AN ANTICLOCKWISE FLOW OF THE FLUID

IT'S A SORT OF LIQUID CUE THAT INFLUENCES THE EMBRYO'S DEVELOPMENT

AND CREATES THE SAID LATERAL LEFT-RIGHT ASYMMETRY

SCIENTISTS THINK THAT MYOSIN IS DIRECTLY INVOLVED IN CREATING THIS UNIQUE FLOW IN KVs



ANATOMICAL

FUNCTIONAL

oooooh! I sense a wonderfully elegant hypothesis here

CILIA ARE LIKE TINY MUSCLES THAT BEAT THANKS TO TWO PROTEINS

MYOSIN & ACTIN

AND BIOLOGICAL ENERGY, OR ATP

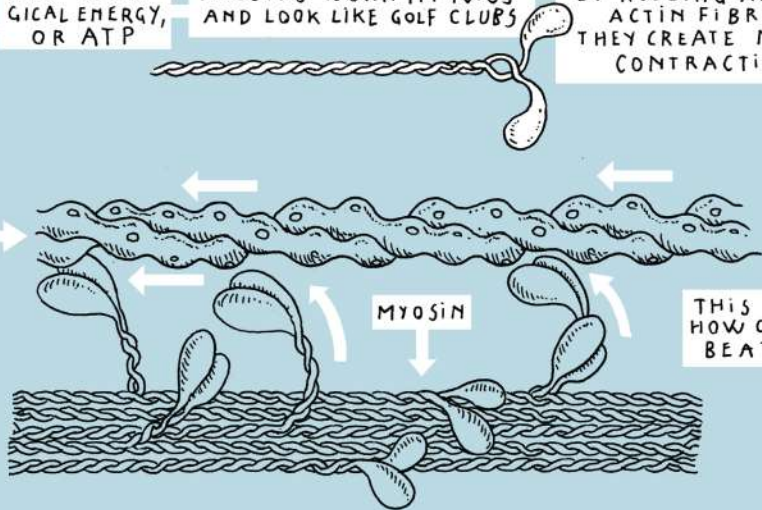
MYOSINS WORK IN TOWS AND LOOK LIKE GOLF CLUBS

BY RUBBING AGAINST ACTIN FIBRES, THEY CREATE MUSCLE CONTRACTION

SUCH TINY MUSCLES



ACTIN



MYOSIN

THIS IS HOW CILIA BEAT

IN ZEBRAFISH KVs, A PARTICULAR FORM OF MYOSIN, MYO1D, IS THOUGHT TO BE INVOLVED IN THE ANTICLOCKWISE FLUID FLOW WHICH MODIFIES THE EXPRESSION OF PROTEINS RESPONSIBLE FOR EMBRYO DEVELOPMENT

SO MYO1D WOULD BE AT THE HEART OF ASYMMETRY IN ZEBRAFISH

IF ASYMMETRY EXISTS AT THE LEVEL OF MOLECULES SURELY THIS MEANS THAT IT IS FUNDAMENTAL

THIS IS WHERE I HAVE TO FIND A JOKE?

QED!

A WONDERFULLY ELEGANT ONE

AND SHOULDN'T BE TAKEN LIGHTLY!

RIGHT?

I'M WASTED

BARREN

SPENT

SCRUNCH

I DON'T CARE ALOYS, IT'S YOUR JOB!

