

ONE EVENING IN 2018, IN THE MIDDLE OF THE INDIAN OCEAN

ALL OF A SUDDEN, FROM OUR HUMBLE RAFT

WE SAW THE WATER GLOW

WERE YOU FRIGHTENED?

NO..I FOUND IT QUITE PRETTY ACTUALLY

YOU DO REALISE THE PLANKTON WANTED TO SCARE YOU OFF..



I HAD NO INTENTION OF EATING IT

UNDOUBTEDLY, BUT THE PLANKTON DIDN'T KNOW THAT

SO IT SWITCHED ITS GFP FULL ON!



AS Aequoria victoria is doing right here

AHHHH NOW I'M SCARED!

I THINK YOU NEED A FEW CLARIFICATIONS

YOU SAID IT

THE GREENEST OF US ALL

GREEN FLUORESCENT PROTEIN → GFP



MUCH IN THE WAY OUR MOVEMENTS ARE SENSED WHEN WE ENTER A ROOM AND THE LIGHT GOES ON

PLANKTON OR JELLYFISH TOO, CAN GLOW SPONTANEOUSLY

TO WARD OFF A PREDATOR

TO ATTRACT PREY OR PARTNERS

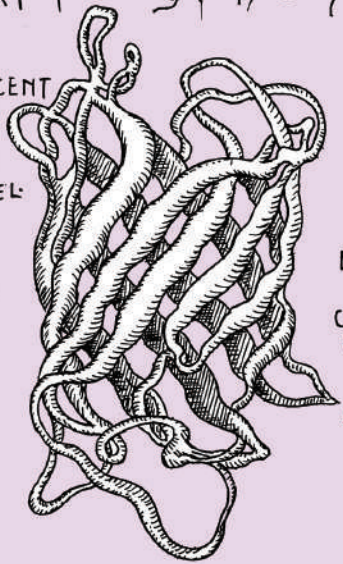
ENZYMES ALSO USE LIGHT TO REPAIR DAMAGED DNA

WE ALL NEED PHOTONS!!

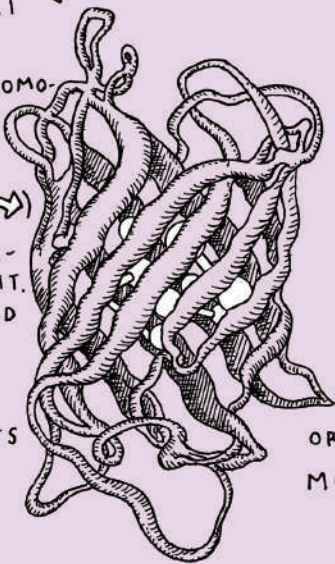
YEAH YEAH

BUT HOW DO JELLYFISH AND PLANKTON GLOW?

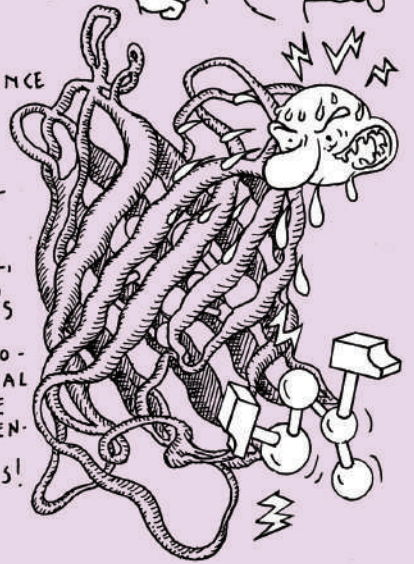
GREEN FLUORESCENT PROTEIN (GFP), IS BARREL SHAPED AND LIKE A LAMP WHOSE BULB



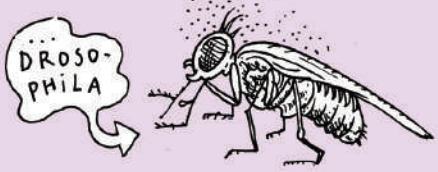
OR CHROMOPHORE (IN WHITE ON THE RIGHT) IS BIOLUMINESCENT. COMPOSED OF ONLY THREE AMINO ACIDS, IT EMITS



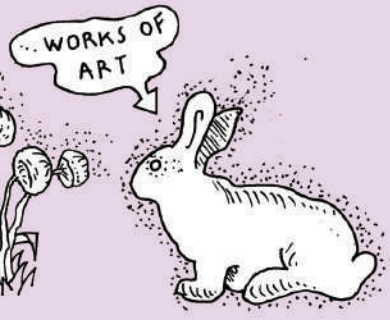
LIGHT ONCE IT HAS ADOPTED A CYCLIC CONFORMATION. THE BARREL, ITSELF, PROTECTS GFP FROM PHOTOCHEMICAL DAMAGE OR ILL-INTENTIONED MOLECULES!



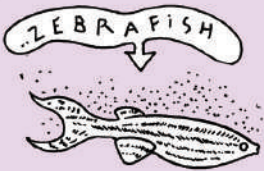
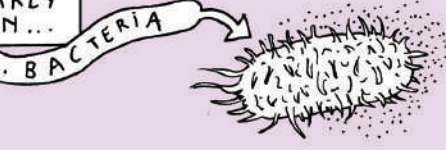
GFP IS WIDELY USED IN CELLULAR AND MOLECULAR RESEARCH, AND EVEN SOMETIMES IN KITSCH ART



... FUNGI



IT IS REGULARLY EXPRESSED IN...



I SENSE YOU NEED A CONCRETE EXAMPLE

CONSIDER A GENE THAT LENDS RICE PLANTS RESISTANCE TO CERTAIN HERBICIDES

AND MUCH IN THE WAY YOU WOULD HOOK A TRAILER ONTO A CAR

OOOOOH I JUST LOVE YOUR MECHANICAL METAPHORS!

... YOU HOOK THE GFP GENE ONTO THE RESISTANCE-CARRYING GENE



THE TWO GENES ARE INTRODUCED INTO THE RICE PLANT'S GENOME

THE DOUBLE-MUTATED PLANT IS LEFT TO GROW

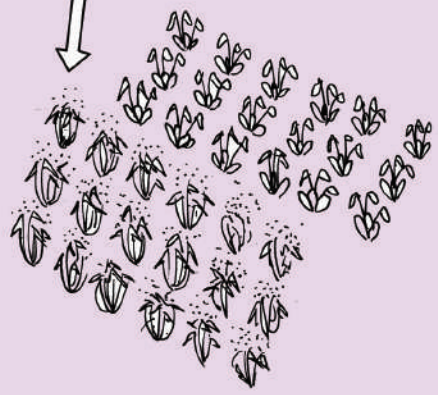
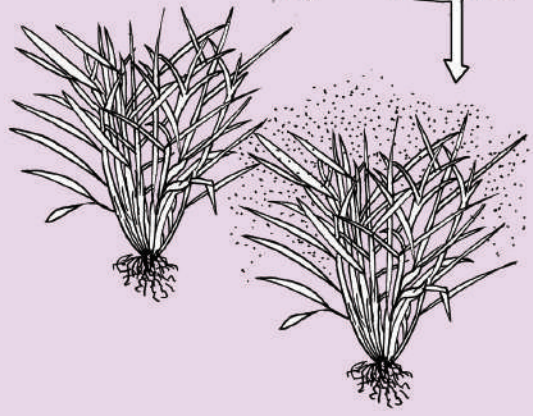
IT IS MADE TO GLOW

HOP

RESEARCHERS KNOW HOW TO DO THAT

IF GFP IS PRESENT, IT WILL EMIT LIGHT, AND SINCE WE KNOW IT IS HOOKED ONTO THE RESISTANCE-CARRYING GENE

WE CAN ACTUALLY SEE WHETHER THIS GENE HAS SPREAD TO A NEARBY WILD RICE PLANT JUST BY LOOKING FOR ITS GLOW



BUMMER

LIGHT EVERYWHERE

DARN



BIOLUMINESCENCE IS BEAUTIFUL!

TELL ME THOUGH, WHY THE MOUSTACHE?

I'M WEARING IT FOR EXPERIMENTAL REASONS

SURE, BLAME EMPIRICISM!

