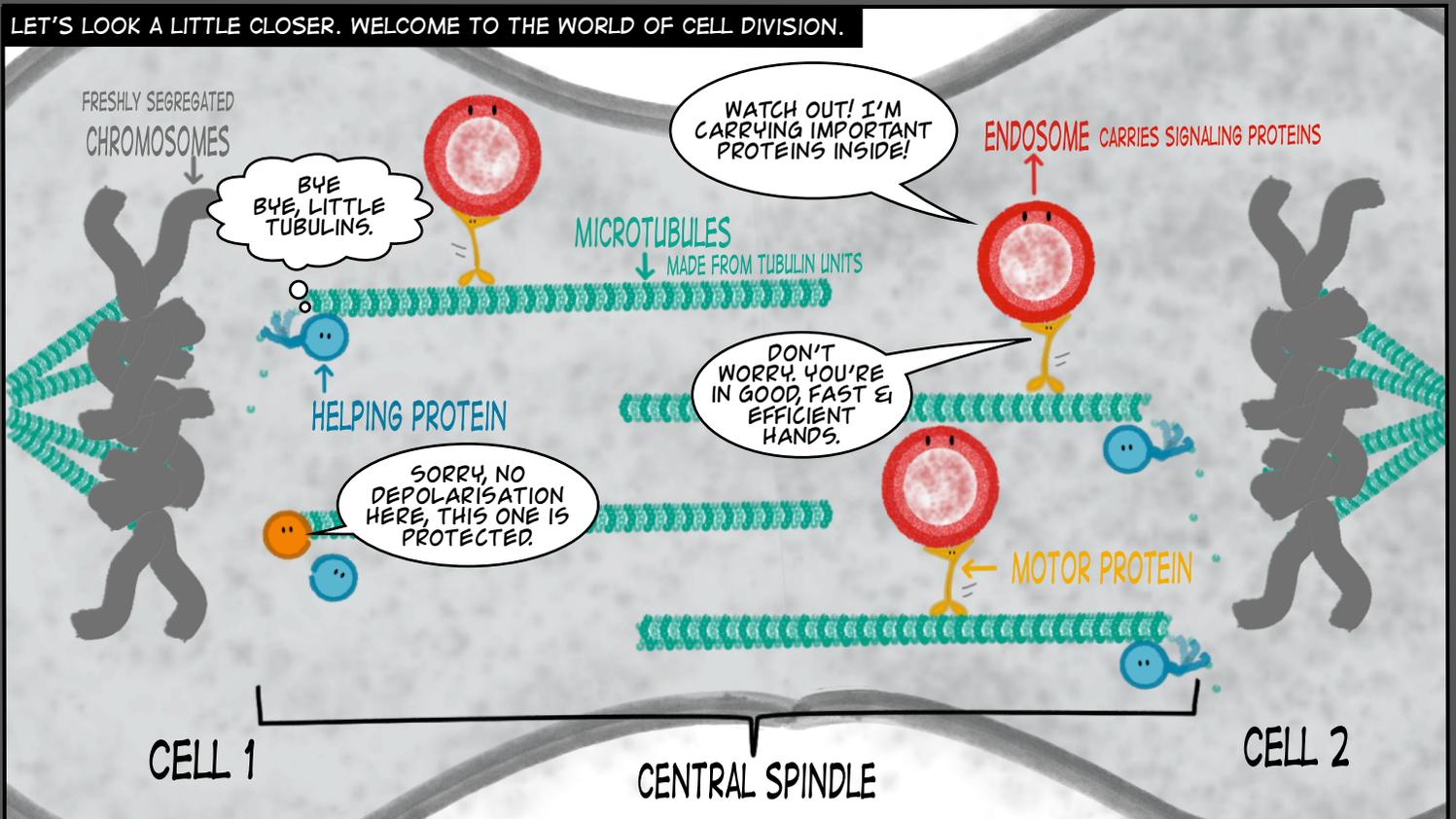
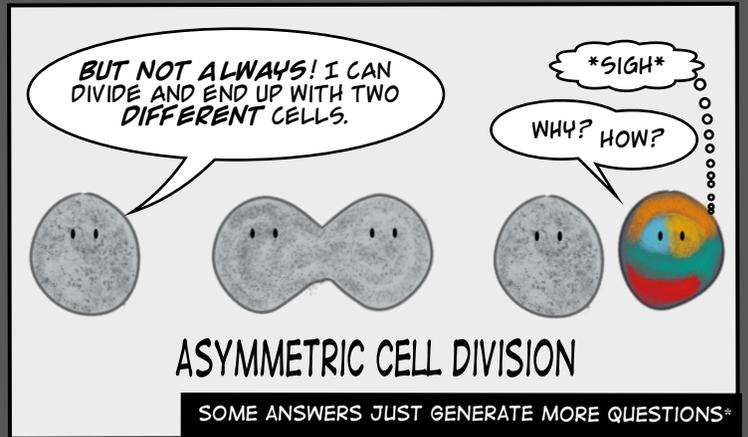
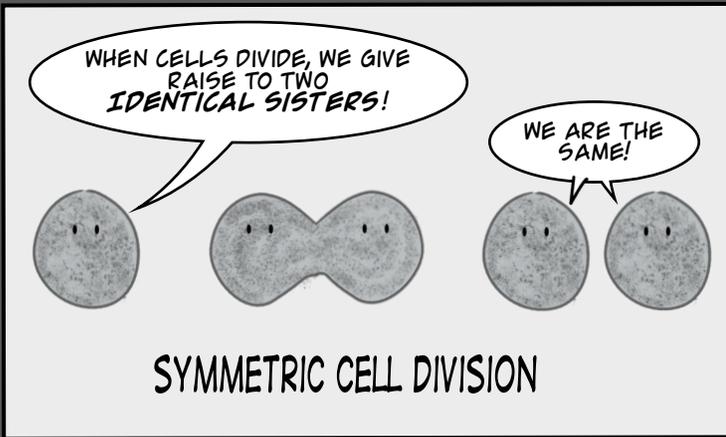
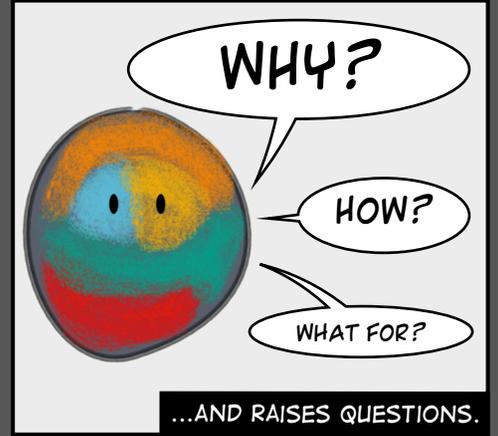
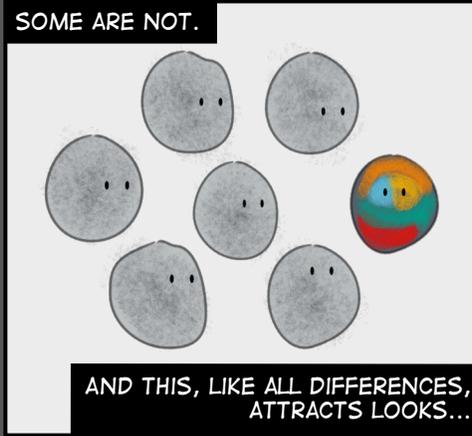
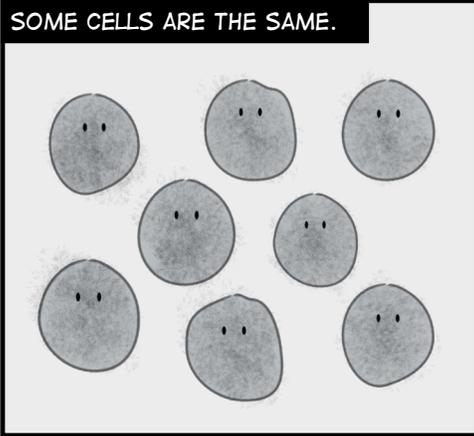
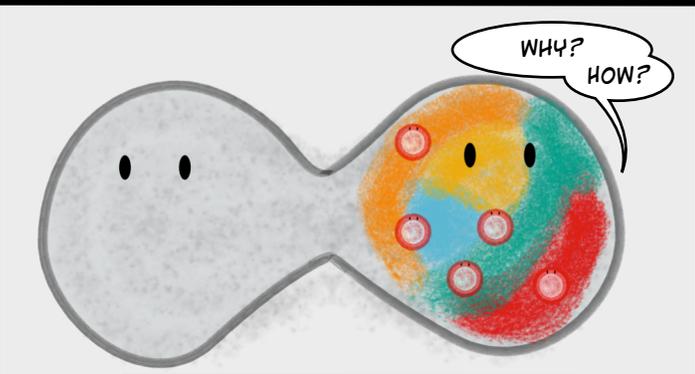


The quest for the asymmetry answer

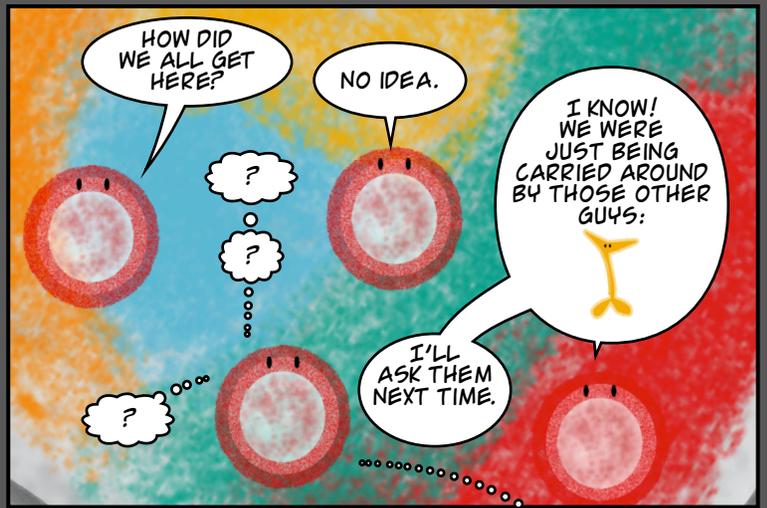
a comic inspired by the talk by Marcos González-Gaitan



AT THE END OF CELL DIVISION ONE CELL GETS MOST OF THE ENDOSOMES.



THE PROTEINS INSIDE THOSE ENDOSOMES WILL ORCHESTRATE THE DIFFERENCE.



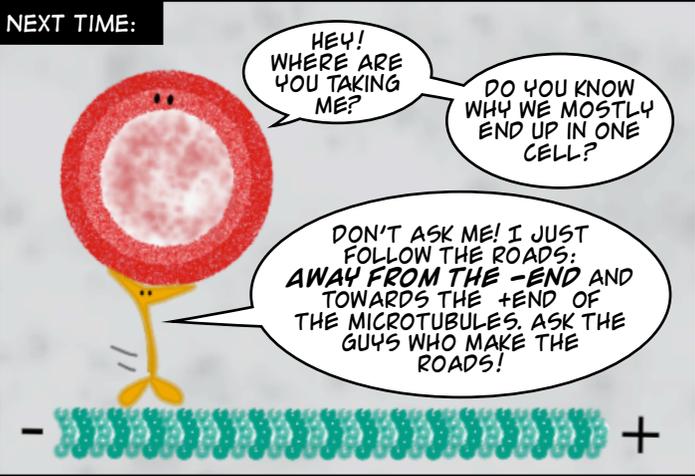
HOW DID WE ALL GET HERE?

NO IDEA.

I KNOW! WE WERE JUST BEING CARRIED AROUND BY THOSE OTHER GUYS:

I'LL ASK THEM NEXT TIME.

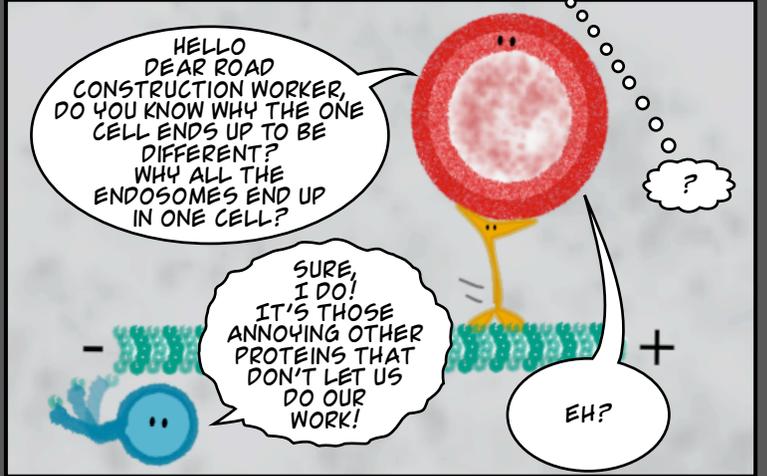
NEXT TIME:



HEY! WHERE ARE YOU TAKING ME?

DO YOU KNOW WHY WE MOSTLY END UP IN ONE CELL?

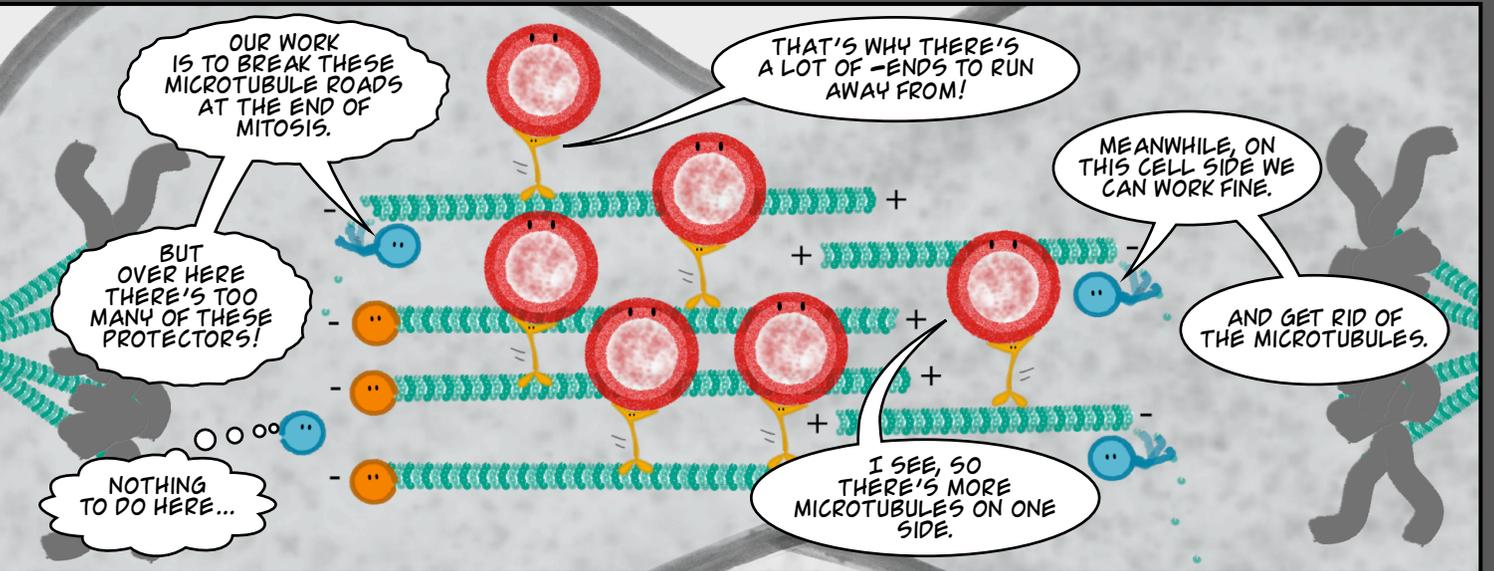
DON'T ASK ME! I JUST FOLLOW THE ROADS: AWAY FROM THE -END AND TOWARDS THE +END OF THE MICROTUBULES. ASK THE GUYS WHO MAKE THE ROADS!



HELLO DEAR ROAD CONSTRUCTION WORKER, DO YOU KNOW WHY THE ONE CELL ENDS UP TO BE DIFFERENT? WHY ALL THE ENDOSOMES END UP IN ONE CELL?

SURE, I DO! IT'S THOSE ANNOYING OTHER PROTEINS THAT DON'T LET US DO OUR WORK!

EH?



OUR WORK IS TO BREAK THESE MICROTUBULE ROADS AT THE END OF MITOSIS.

BUT OVER HERE THERE'S TOO MANY OF THESE PROTECTORS!

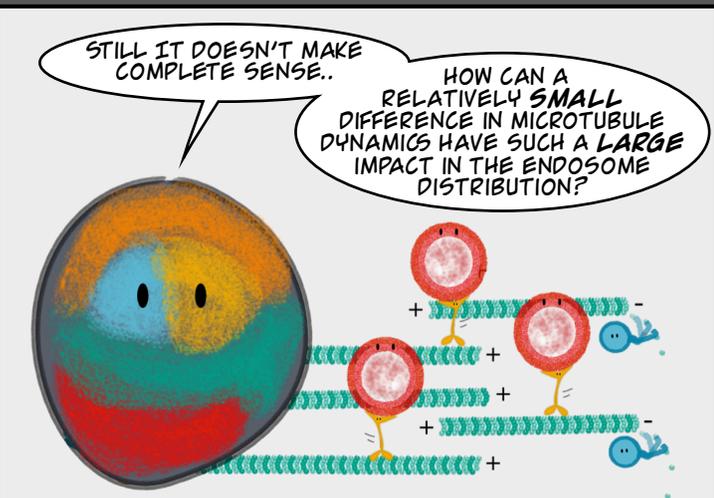
NOTHING TO DO HERE...

THAT'S WHY THERE'S A LOT OF -ENDS TO RUN AWAY FROM!

MEANWHILE, ON THIS CELL SIDE WE CAN WORK FINE.

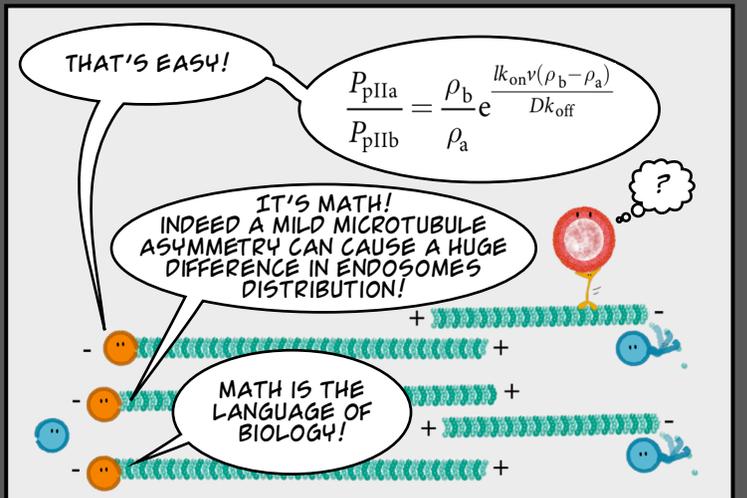
AND GET RID OF THE MICROTUBULES.

I SEE, SO THERE'S MORE MICROTUBULES ON ONE SIDE.



STILL IT DOESN'T MAKE COMPLETE SENSE..

HOW CAN A RELATIVELY SMALL DIFFERENCE IN MICROTUBULE DYNAMICS HAVE SUCH A LARGE IMPACT IN THE ENDOSOME DISTRIBUTION?

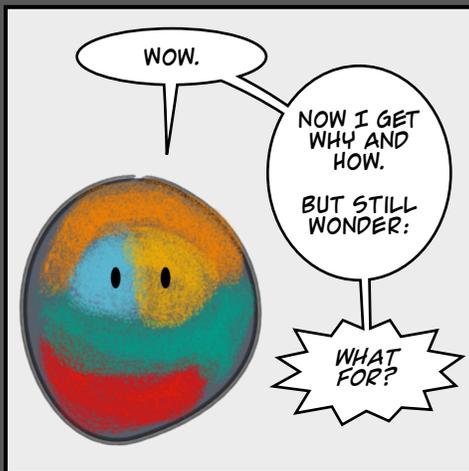
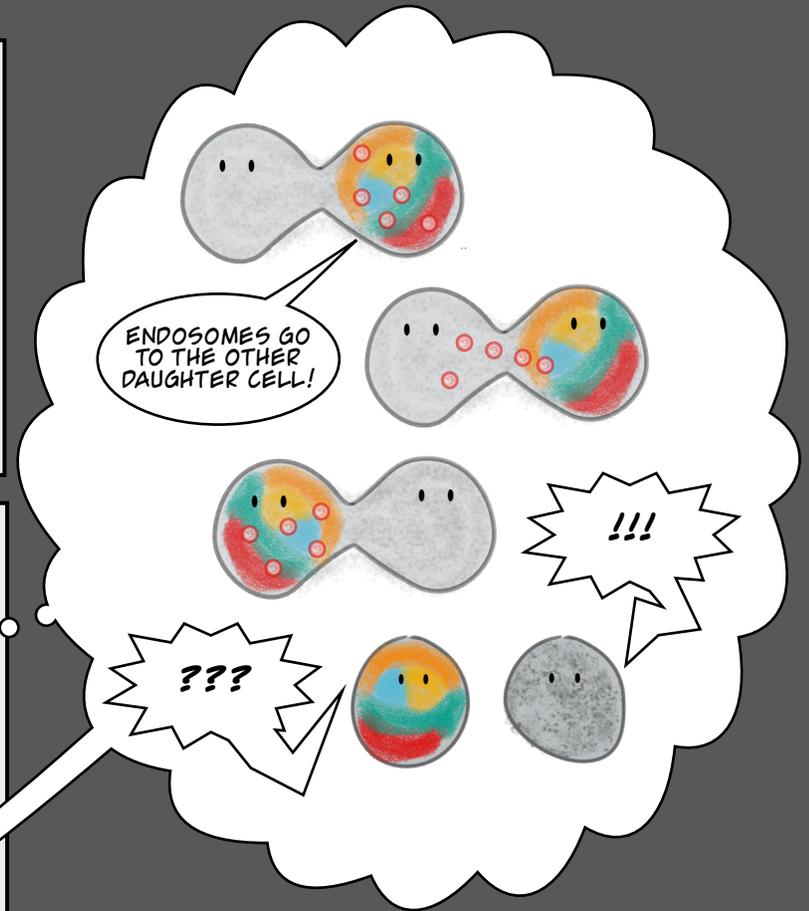
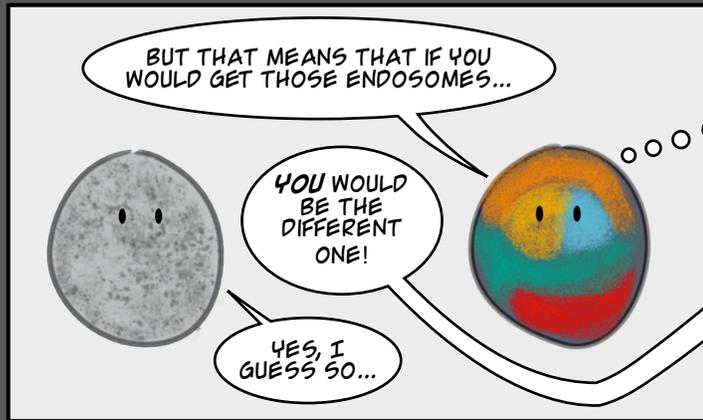
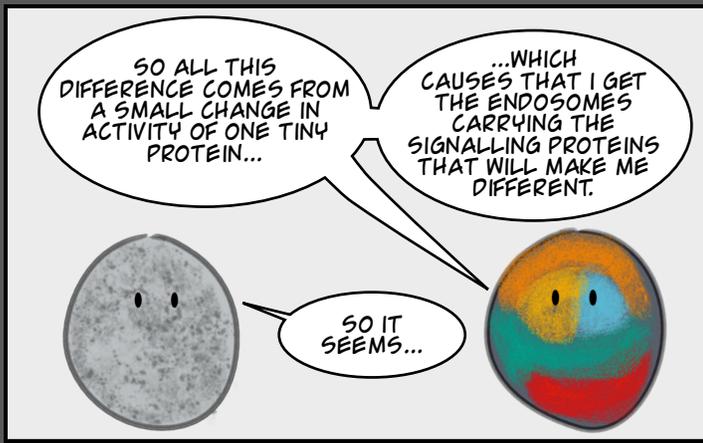


THAT'S EASY!

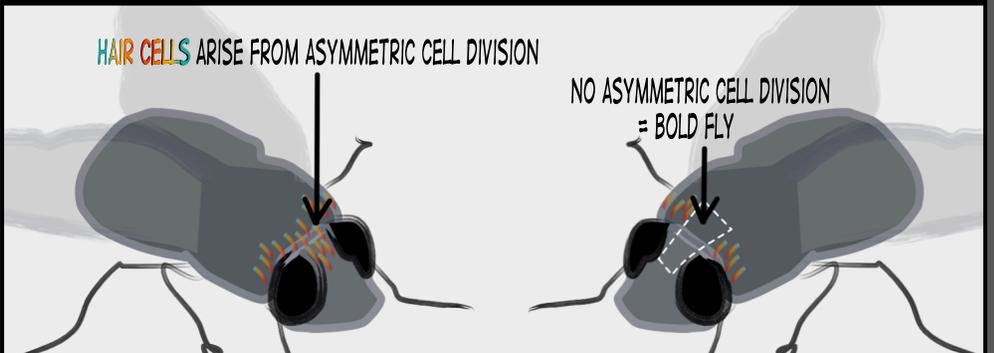
$$\frac{P_{pIIa}}{P_{pIIb}} = \frac{\rho_b}{\rho_a} e^{\frac{k_{on}v(\rho_b - \rho_a)}{Dk_{off}}}$$

IT'S MATH! INDEED A MILD MICROTUBULE ASYMMETRY CAN CAUSE A HUGE DIFFERENCE IN ENDOSOMES DISTRIBUTION!

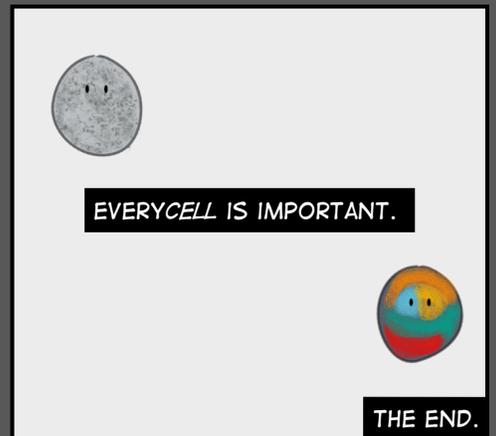
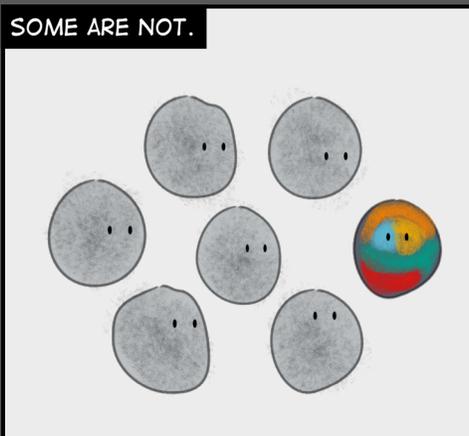
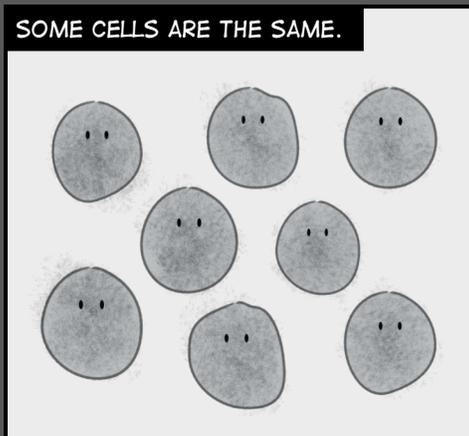
MATH IS THE LANGUAGE OF BIOLOGY!



THE EXAMPLE WHERE THIS WAS STUDIED INVOLVES HAIR CELL FORMATION IN FLIES.



BUT ASYMMETRIC CELL DIVISION IS FOUND IN MANY MORE ORGANISMS. IT'S CRUCIAL TO FORM DIFFERENT CELL TYPES DERIVED FROM STEM CELL POOLS.



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