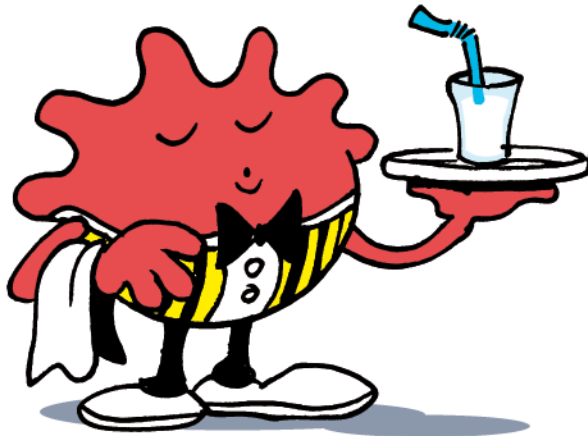


# LACTATE POWER




TEXT : ANNE-KARINE BOUZIER-SORE  
ARTWORK AND BALLOONS : MATYO

BRAIN WEIGHT ACCOUNTS FOR ONLY 1 TO 2% OF TOTAL BODY WEIGHT.



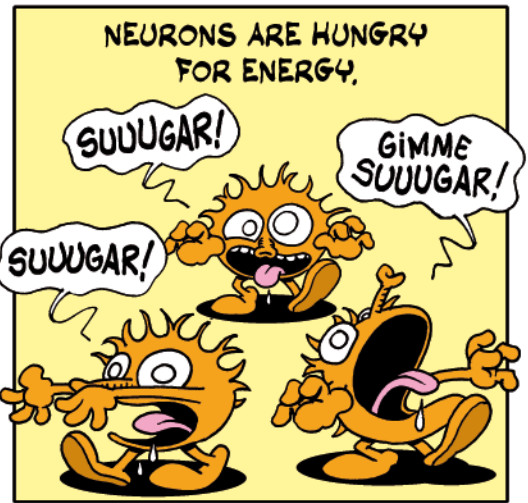
Show-off!

THE BRAIN CONSUMES 25% OF TOTAL BLOOD GLUCOSE.



It's not for me, it's for my brain!

NEURONS ARE HUNGRY FOR ENERGY.



SUUUGAR!

GIMME SUUGAR!

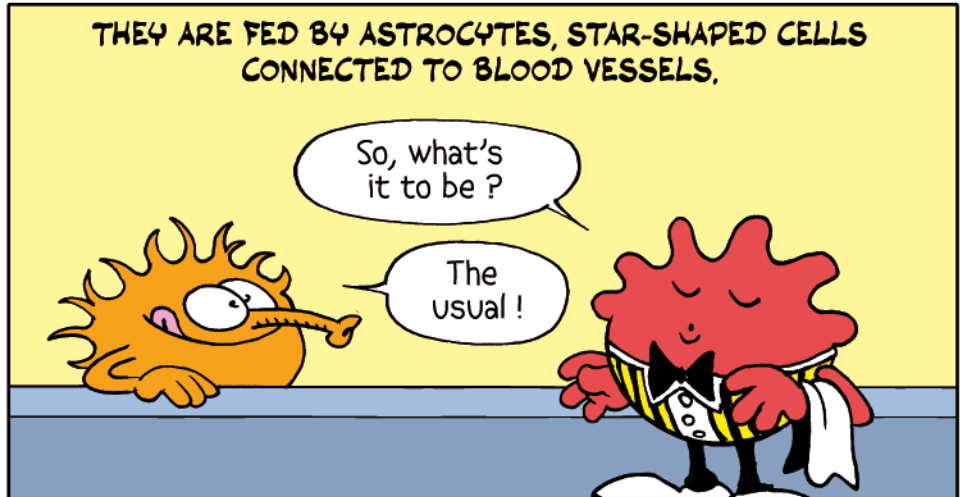
SUUUGAR!

THEY NOT ONLY FEED ON GLUCOSE BUT ALSO ON LACTATE.



HEY! Waiter!

THEY ARE FED BY ASTROCYTES, STAR-SHAPED CELLS CONNECTED TO BLOOD VESSELS.



So, what's it to be?

The usual!

ASTROCYTES TAKE UP GLUCOSE FROM THE BLOOD AND CONVERT PART OF IT...



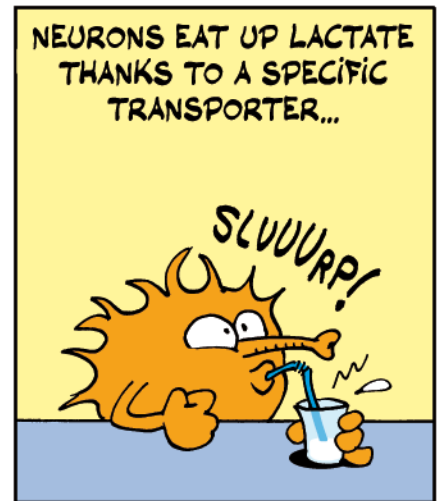
BLOOD SYSTEM

...INTO LACTATE.



Mmm...

NEURONS EAT UP LACTATE THANKS TO A SPECIFIC TRANSPORTER...



SLUUURP!

...AND CONVERT IT INTO ENERGY!



HAHAHA! ONE LACTATE AND IT'S TAKEOFF!!

THIS LACTATE TRANSPORT FROM ASTROCYTES TO NEURONS IS CALLED LACTATE SHUTTLE



Weird name!





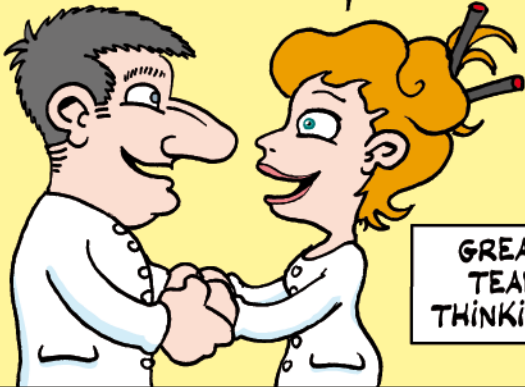
THEN, SOME SCIENTISTS HAD THIS IDEA:

If lactate...

...is good for neurons...

...why not use it...

...to treat some brain diseases?



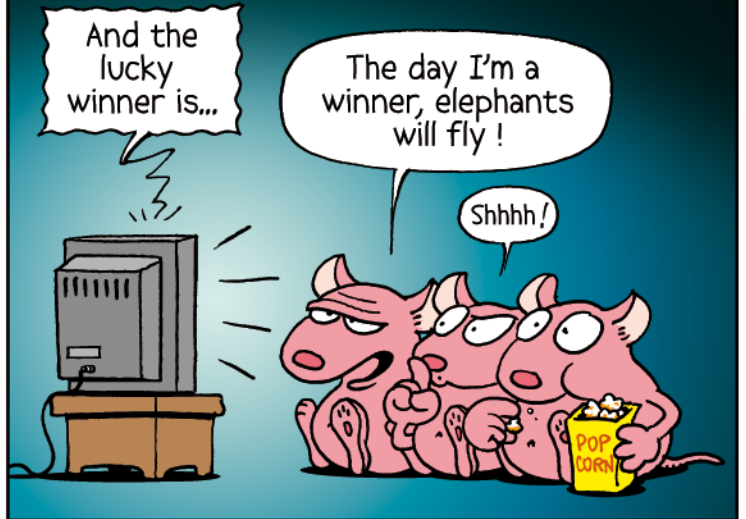
GREAT TEAM THINKING!

THIS EXPERIMENT WAS PERFORMED ON BABY RATS THAT HAD CEREBRAL ISCHEMIA\*: SOME GOT LACTATE AND THE OTHERS DIDN'T.

And the lucky winner is...

The day I'm a winner, elephants will fly!

Shhhh!



RATS WERE SPLITED IN THREE GROUPS :

GROUP 1 :  
ISCHEMIC RAT PUPS  
WITHOUT LACTATE  
INJECTION



GROUP 2 :  
ISCHEMIC RAT PUPS  
WITH LACTATE  
INJECTION



CONTROL GROUP :  
NON-ISCHEMIC RAT PUPS  
WITHOUT LACTATE  
INJECTION



\* ISCHEMIA IS WHEN BLOOD IS NOT GETTING TO AN ORGAN CORRECTLY

Yeah, no supply, you get to die.

Wow ! Poetic, man !



RESULTS: ISCHEMIC RAT PUPS RECEIVING LACTATE RECOVER MUCH FASTER THAN THOSE NOT RECEIVING IT.

BY LACTATIS!!



...and why don't you publish the recipe, Mister NoSecret?...

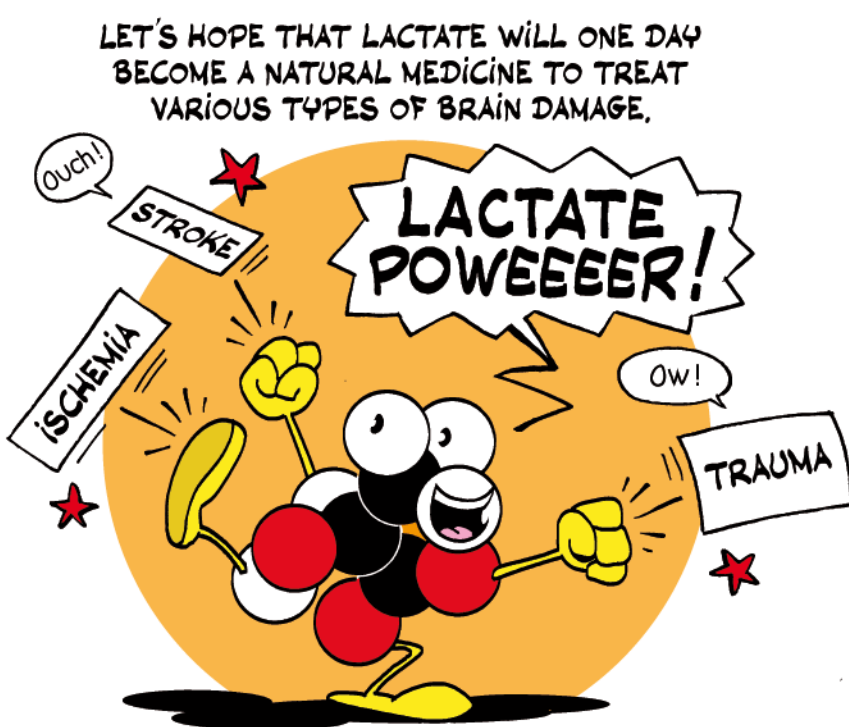
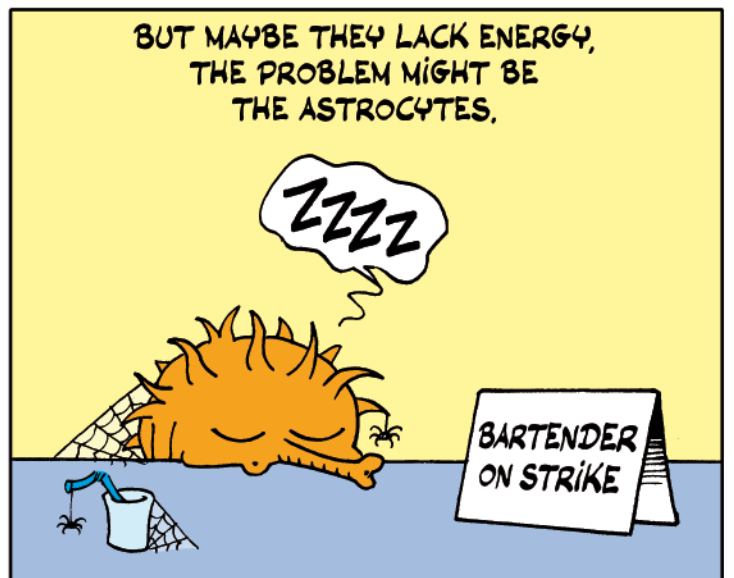
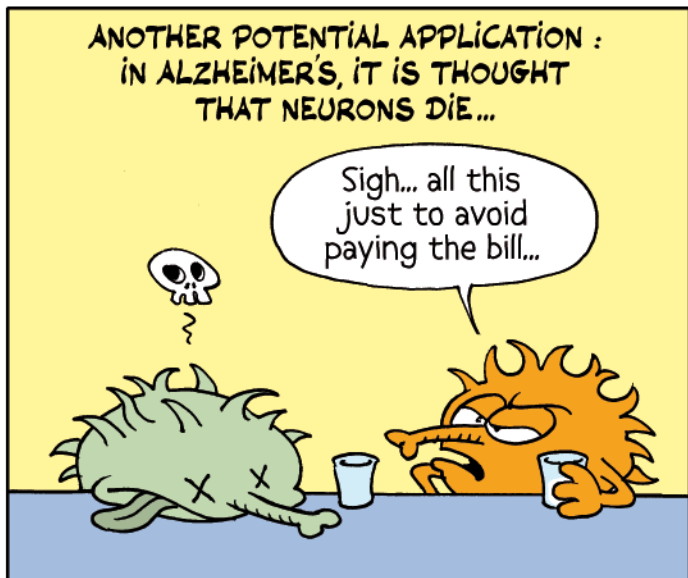
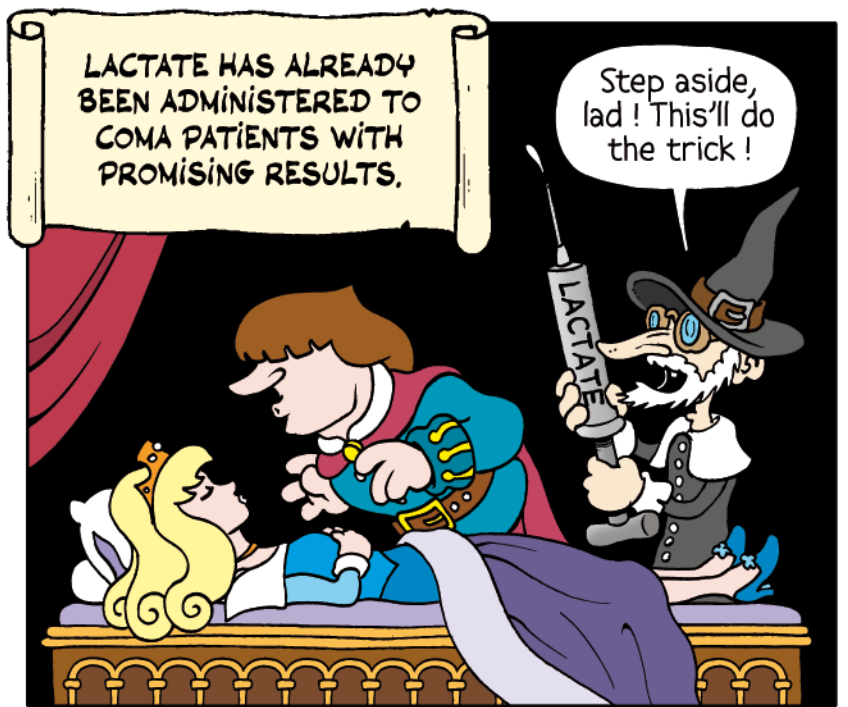
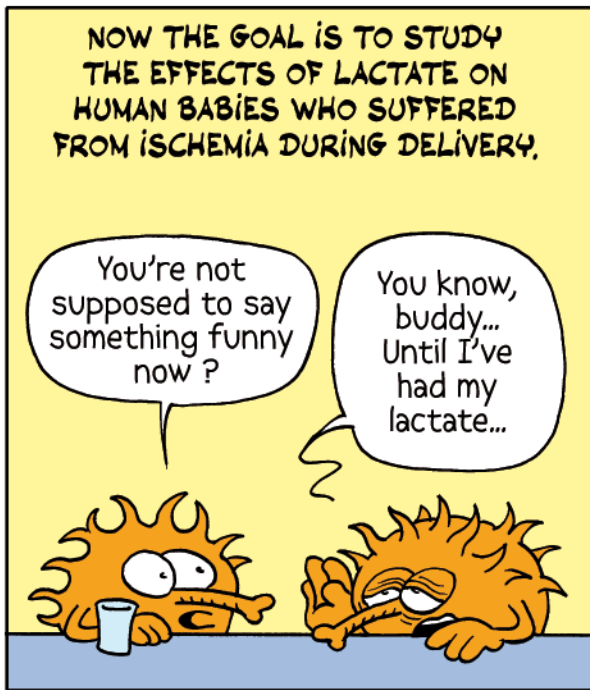


CONCLUSION: LACTATE IS NEUROPROTECTIVE. WE STILL DON'T KNOW HOW IT WORKS IN DETAIL BUT LACTATE MAY BE USED AS A SUBSTRATE WHICH ALLOWS NEURONS TO SURVIVE.

Yep ! Call me Survivor !

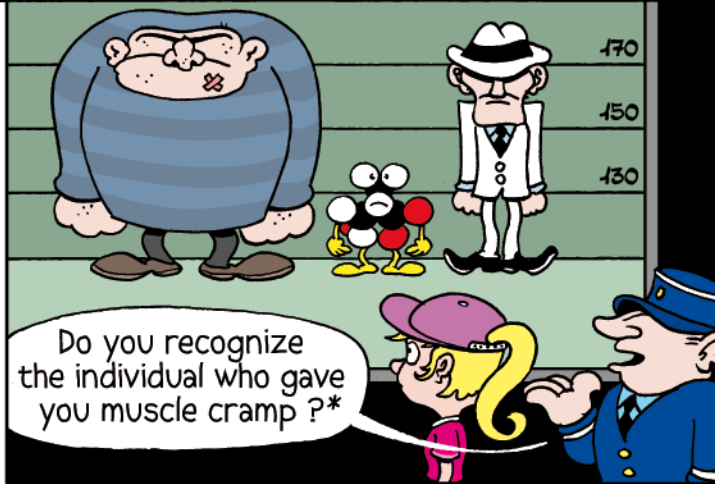
No way, Lance... you were on dope !





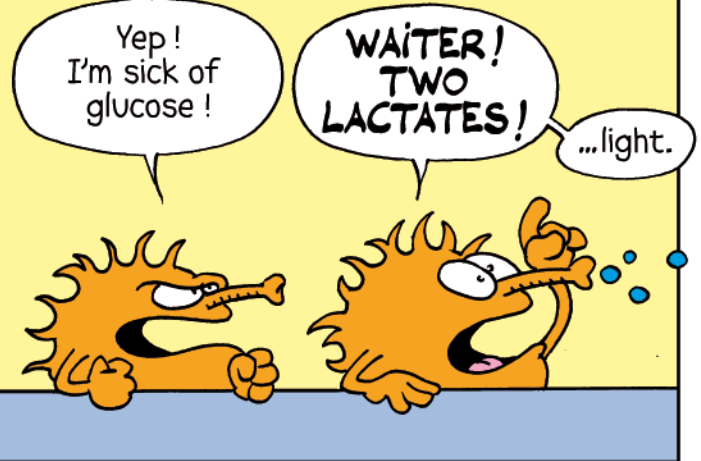


LACTATE HAS HAD A BAD REPUTATION : IT IS PRODUCED BY MUSCLES DURING PHYSICAL ACTIVITY AND INCREASES WITH BRAIN DAMAGE...



\*USUAL SUSPECT!

UNLIKE GLUCOSE, WHICH IS CONSIDERED AN ENERGY SOURCE, LACTATE HAS BEEN CAST AS A TRASHY MOLECULE. WELL IT'S TIME TO CHANGE ALL THAT!



MOREOVER, NEUROSCIENCES HAVE LONG FOCUSED ON NEURONS, THE MASTER CELLS...

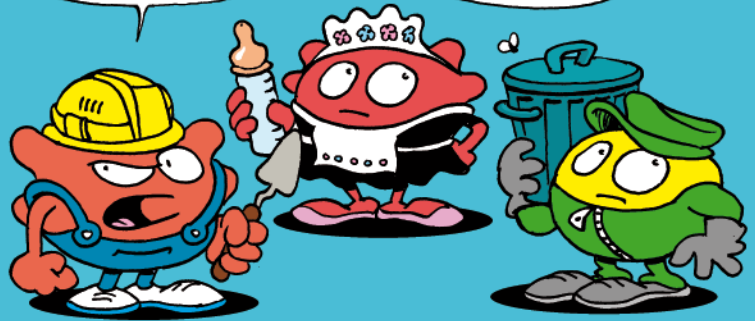
Hey ! When we say "NEUROsciences", it's not for nothing !



...WHILE CONSIDERING GLIAL CELLS AS NANNIES, MASONS OR TRASH COLLECTORS FOR THE BRAIN.

So what?! There's no second-class job!

Is it here the casting for Village People?



THE ROLE OF GLIAL CELLS IS IN FACT MUCH MORE COMPLEX, THERE'S A WHOLE LOT MORE TO DISCOVER!

In fact, if I'm working as a barman, it's to pay for my astrophysics classes...



FINALLY, KEEP IN MIND THAT EINSTEIN'S BRAIN DIDN'T HAVE MORE NEURONS THAN THE COMMON MAN'S, BUT MANY MORE ASTROCYTES ! SO... LET'S HEAR IT FOR ASTROCYTES!

EXACTLY !  $E=MC^2$ , IT'S THANKS TO ME !!!

And the atomic bomb?

