

A escola a moldou
para ser uma

cientista

COM APENAS 18 ANOS, MARIA VITÓRIA VALOTO
JÁ É UMA PESQUISADORA COM SONHOS
GRANDIOSOS







FABIO BRUSCHI
INSPIRING EDUCATOR

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LACTOSE-FREE MILK FOR EVERYONE

Around the world, **many people don't have the enzyme they need to properly digest milk**, and in Brazil, at least 50 million people are affected.

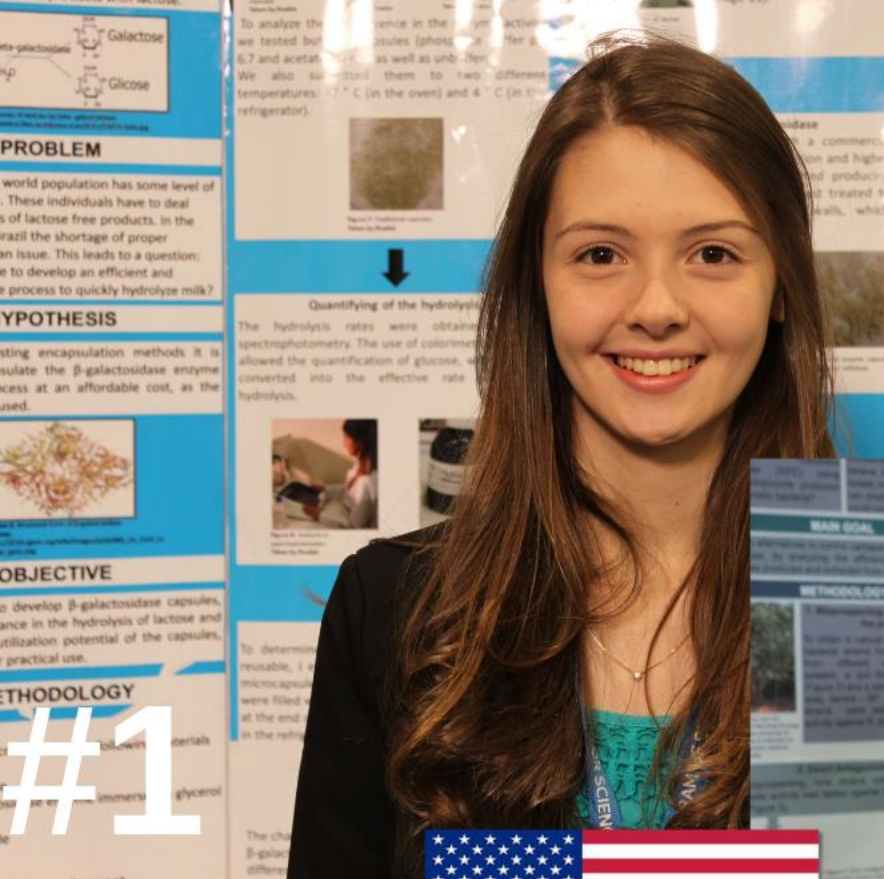
Lactose-free milk and non-dairy alternatives can lack key nutrients and be too expensive for most people to afford regularly, so Maria created a **cheap, reusable capsule to break down the lactose in milk** of any fat content.

Maria's capsule works from fridge temperatures to up to 37 degrees Celsius and can be reused for up to seven days, making the **benefits of drinking milk accessible to anyone**.



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Sachet Simulation
The sachet simulation proved the efficiency of the capsules in milk. In twenty-three hour, twenty capsules reached 100% hydrolysis of 20 ml of milk at 4°C.

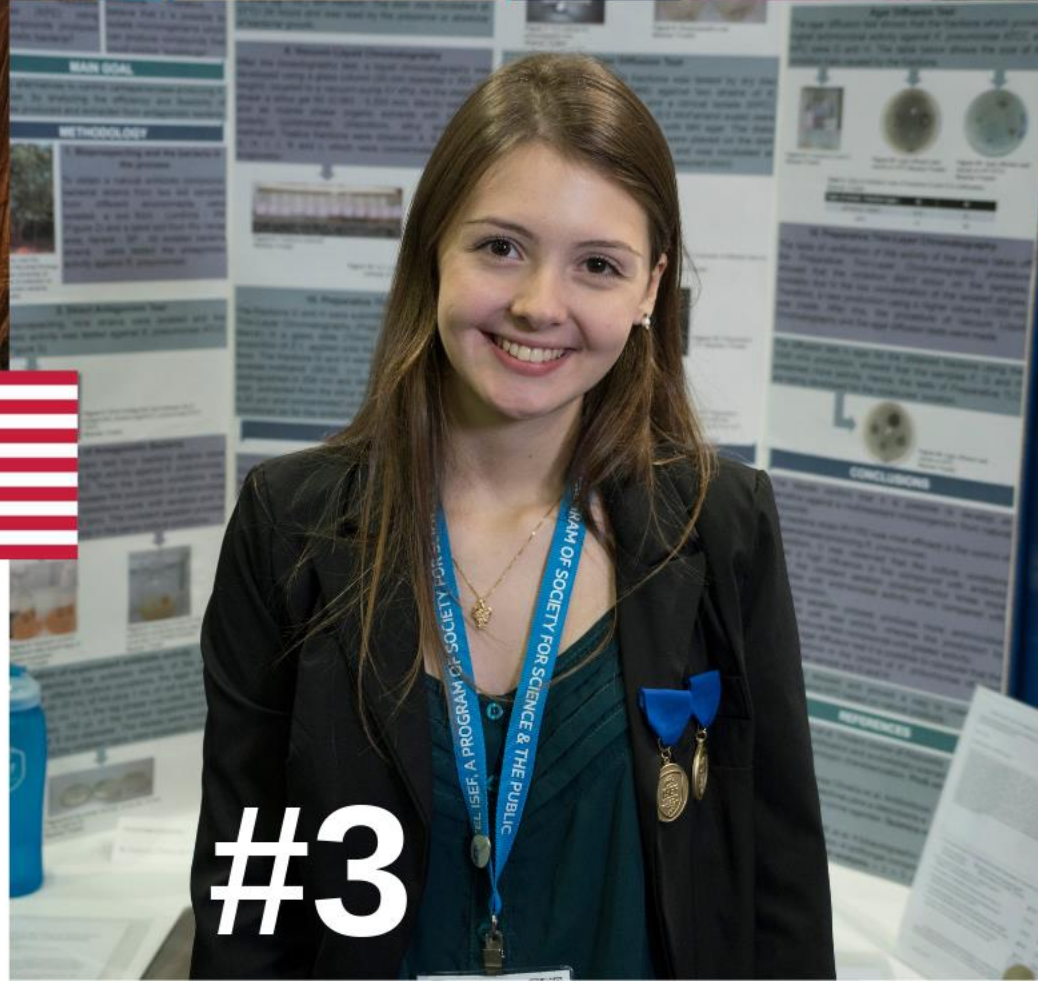
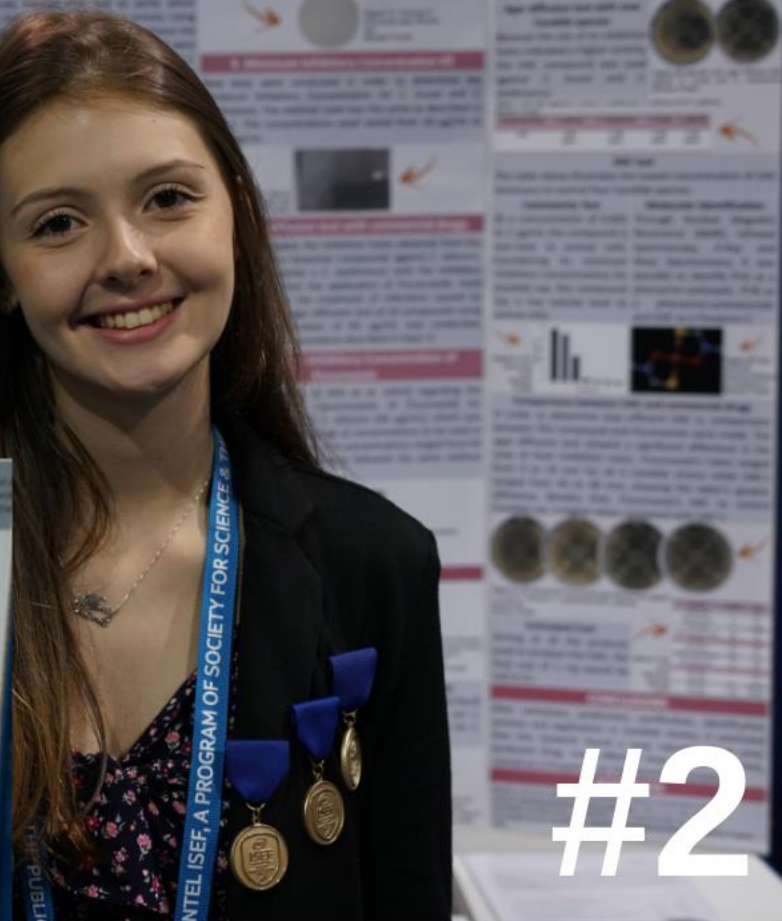
Tests with whole milk and skim milk
The activity of the capsules in commercial milk was also effective. In two hours and thirty minutes, 50 capsules managed to hydrolyse 100% of the lactose in 200 ml of milk. The results were the same in whole milk and skimmed milk, demonstrating that the fat found in the milk does not affect the enzymatic activity of the capsules.

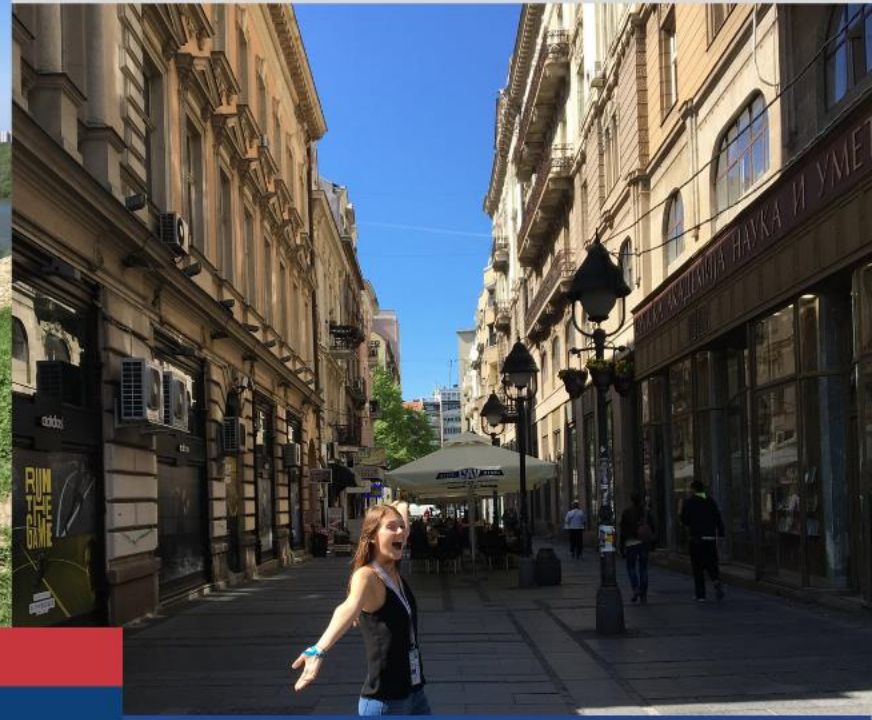
Production of β -Galactosidase
Using *Kluyveromyces fragilis* yeast, it was possible to obtain a 5-day stability in the hydrolysis rate, using capsules containing only the enzyme obtained from the cell walls of the yeast. Capsules with Xaritan gum and Carboxymethyl cellulose showed significantly

PROBLEM
The world population has some level of lactose intolerance. These individuals have to deal with the shortage of proper products. This leads to a question: how to develop an efficient and affordable process to quickly hydrolyze milk?

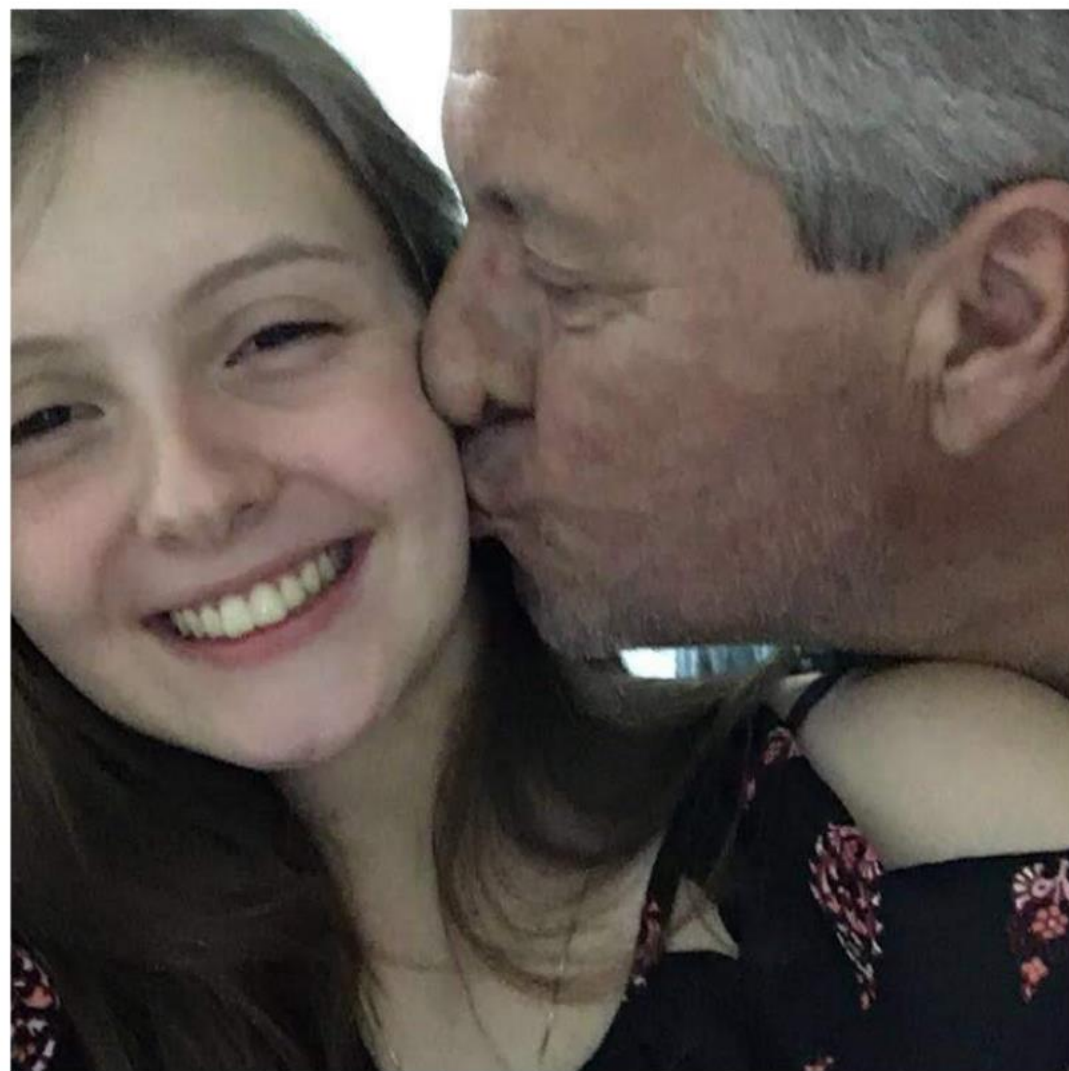
OBJECTIVE
To develop β -galactosidase capsules, which enhance the hydrolysis of lactose and utilization potential of the capsules, for practical use.

METHODOLOGY
To determine the stability of the capsules, 100 capsules were filled with the enzyme at the end of the hydrolysis process in the refrigerator.



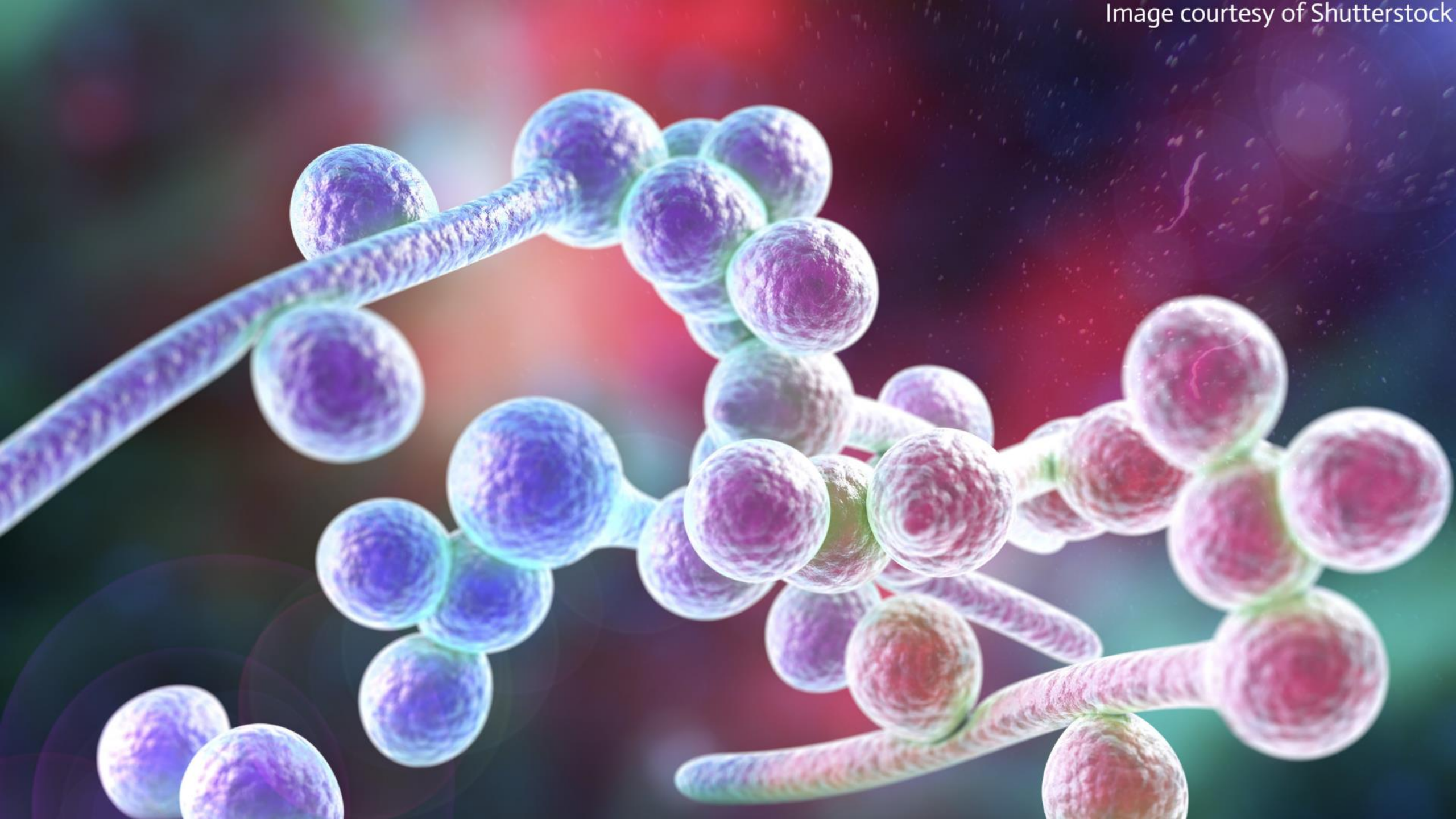








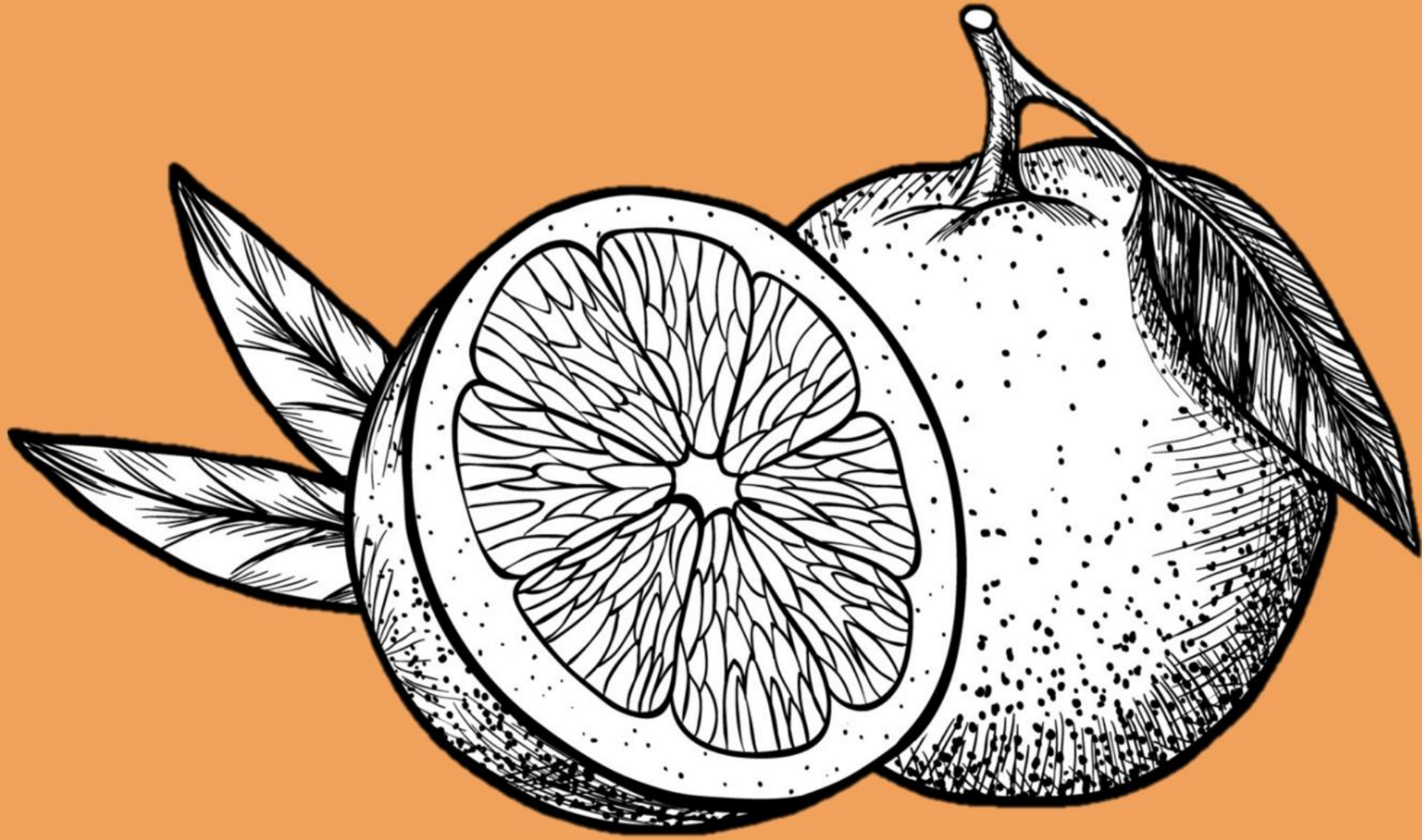




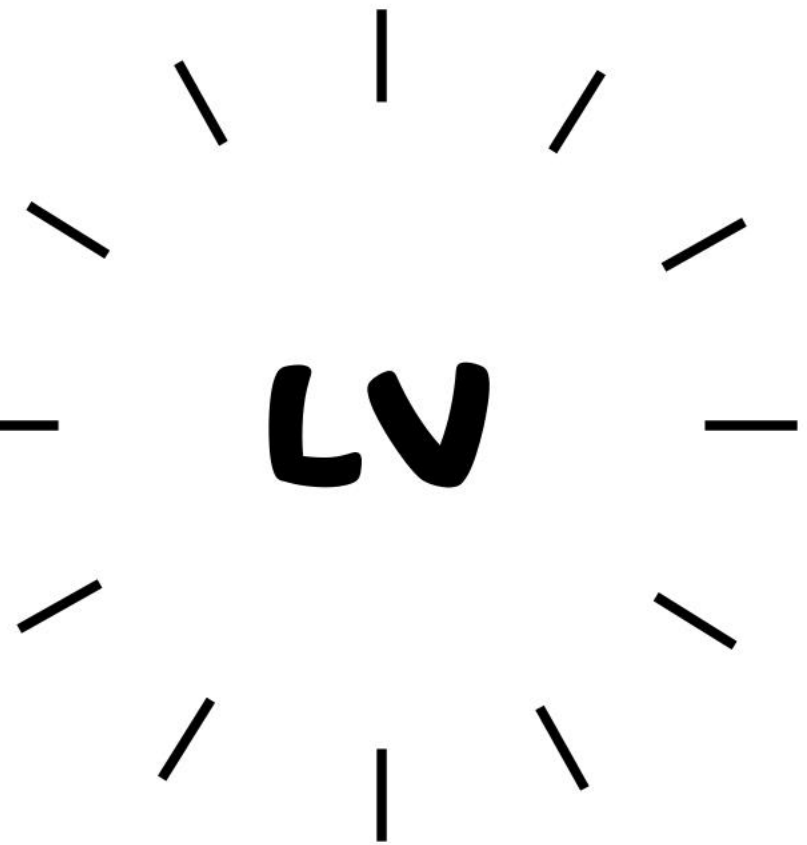
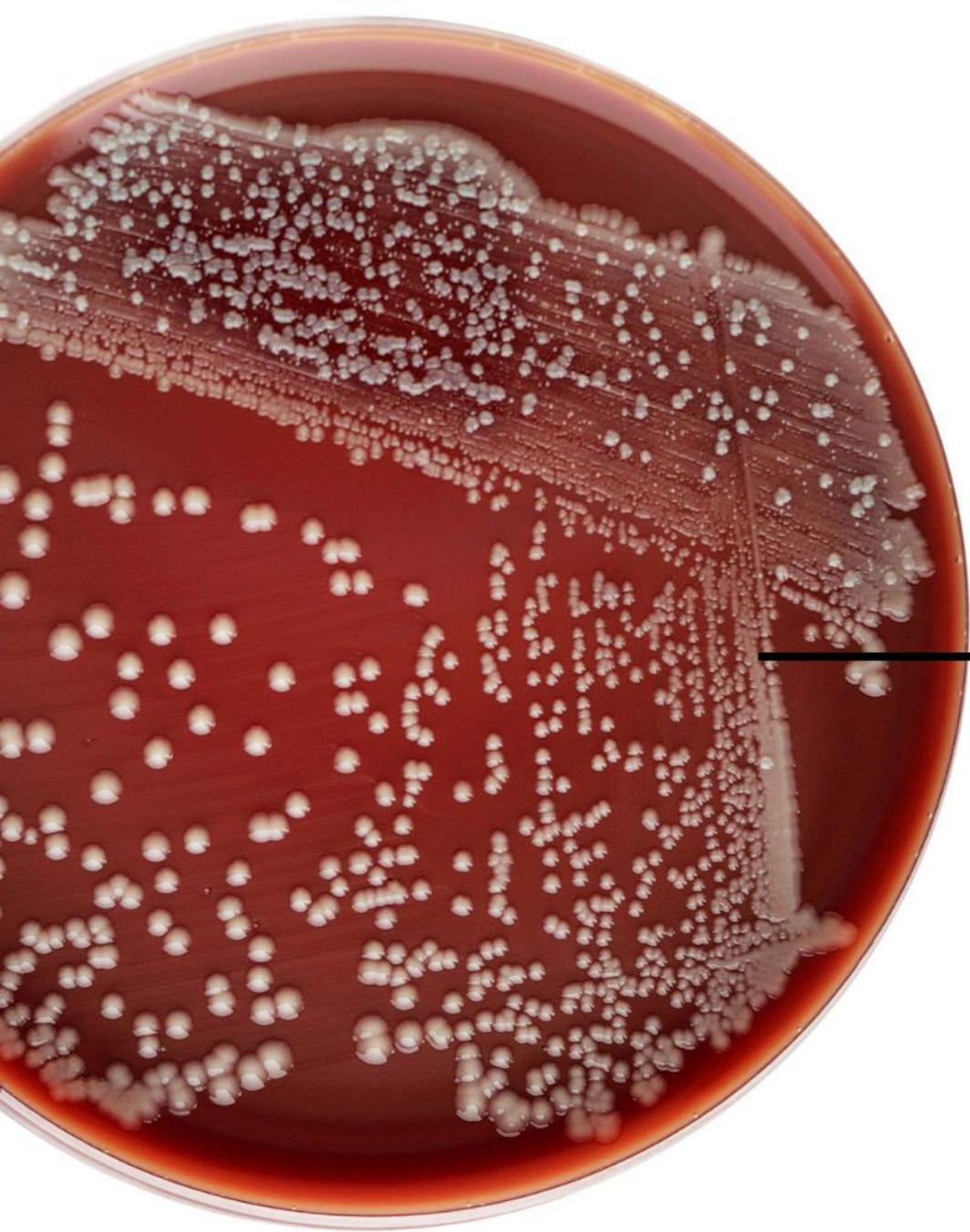


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PRODUÇÃO



EXTRAÇÃO



PURIFICAÇÃO

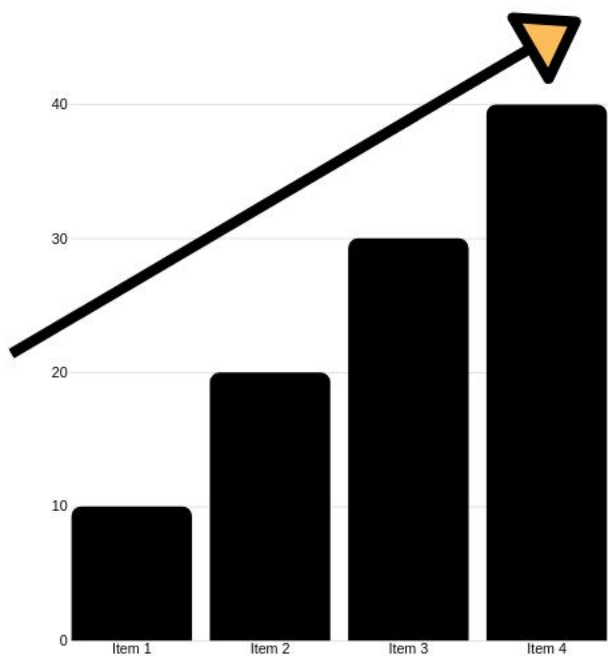


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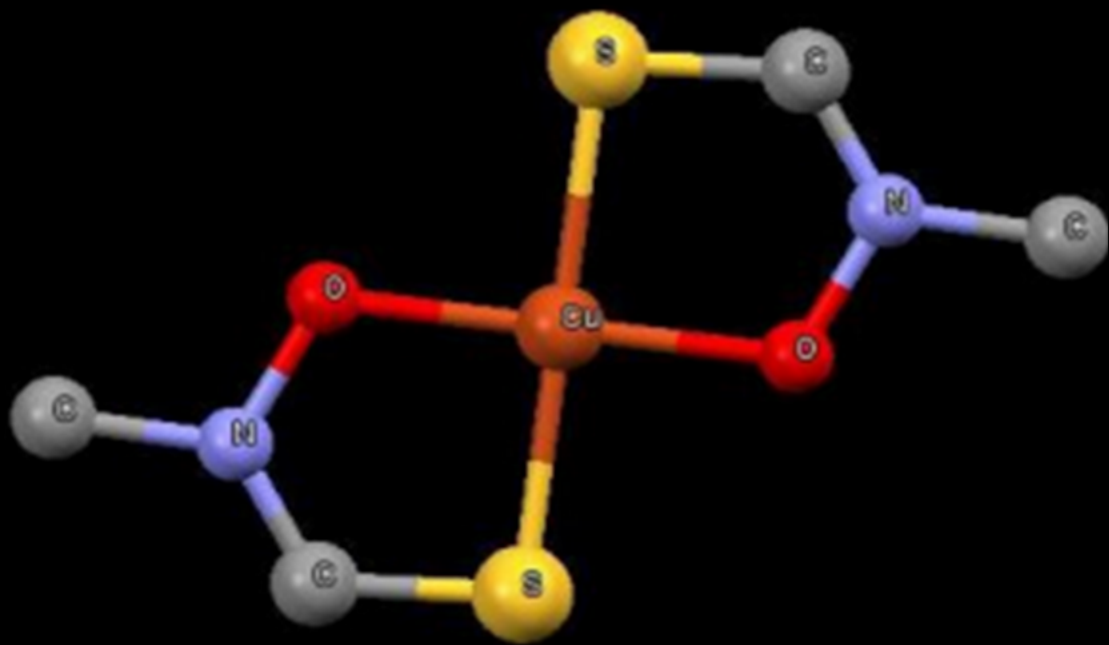
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