



# BioMixing

*Leaders in bioreactor mixing*

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Can you imagine a  
World where...  
**the waiting time for  
vaccines,  
cancer treatments or  
other pharma drugs  
could be reduced ?**

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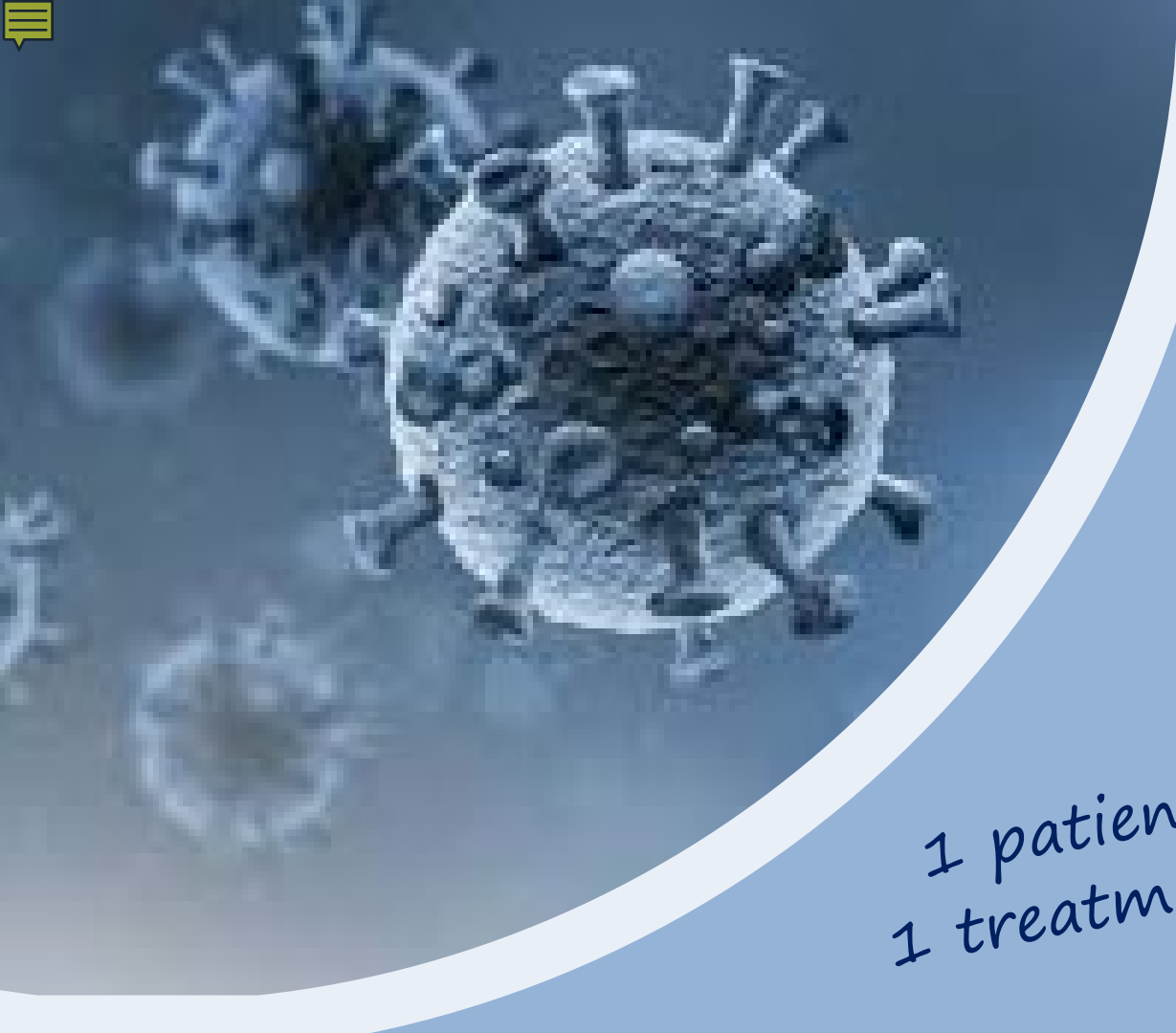
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# Bioreactors

## What are they for?

*They are the basic equipment for...*

*Cancer  
treatment*

*Vaccines  
COVID-19*

*1 patient  
1 treatment*

*Biological  
compounds*

*...many other  
pharma drugs*

## Stirred bioreactors

# Pains in the bioreactor market

"Our processing  
*times* are too long"



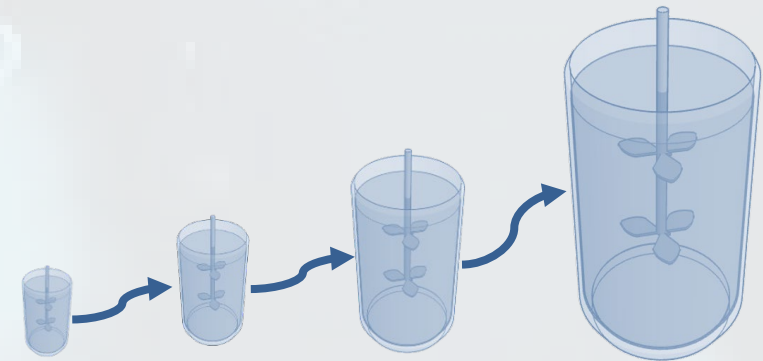
"Product *quality* should be  
improved (homogeneity, shear...)"



"Equipment is  
*expensive*"



"Too many *steps* in  
the process of scaling"



# What we achieve...



Higher efficiency leads to **saving money**



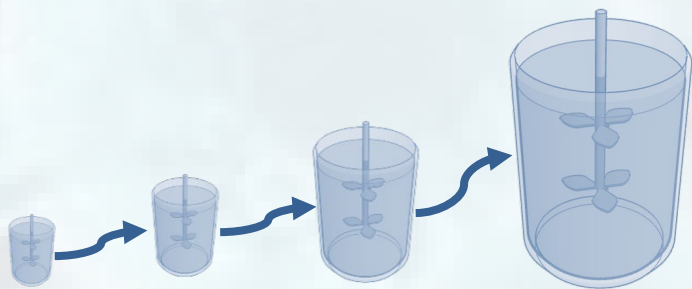
Better mixing that leads to **higher yield & quality** of culture



Our **technology** reduce shear & mixing time (50%-75%)

Make **simulations** that reduce process of scaling

**PATENT pending**



BioMixing





## NEWS

# Coronavirus: EU demands UK-made AstraZeneca vaccine doses

🕒 27 January 2021

🔍 Search

US edition ▾

# The Guardian

News website of the year

## Why has AstraZeneca reduced its projected vaccine supplies to the EU?

AstraZeneca warned the European commission on Friday that there would be a significant shortfall in the promised 100m vaccine doses this quarter, of **up to 60%**. It says this is due to a technical issue: not enough vaccine is being produced by the main plant making the supplies destined for Europe, which is in Belgium.

Making vaccines is not like building houses, where you can add a few more bricks to a wall if it's too short, they say. This is a biological process and it's not possible to be certain how much vaccine is going to be made once production is under way. The yield varies.

WHITE HOUSE

## With Covid funding stalled, White House prepares for vaccine shortage in the fall

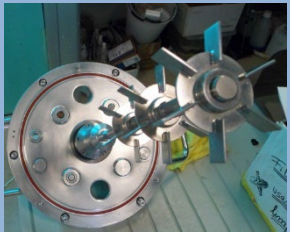
The federal government would need to secure a new vaccine contract in the coming weeks to ensure enough supply for the entire country, an administration official said Monday.



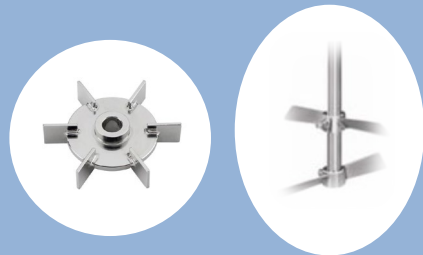
## Stirred bioreactor components



- ✓ Vessel
- ✓ Pumps
- ✓ Aerators
- ✓ Agitator system
- ✓ Heating/cooling
- ✓ Sensors
- ✓ Filters
- ✓ Control system
- ✓ Software...



Standard  
impellers



## Where is our innovation?

*It is based on fluid dynamic principles*

- ✓ Different geometry of the impellers
- ✓ Different number & position of impellers
- ✓ Different baffle geometry
- ✓ Aerator system
- ✓ Combination of agitators-baffles-aeration

*Biomixing* technology allows a better mixing even in large bioreactors, where the blade tip velocity is usually limited to avoid shear

**PATENT  
pending**



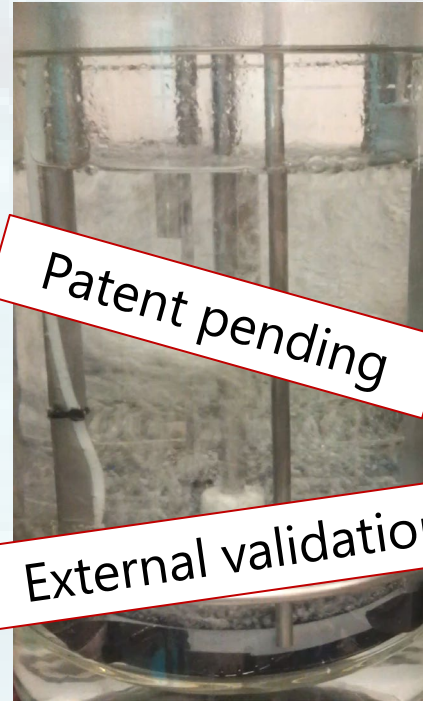
# An example (external validation by a client)

Well-known brand bioreactor



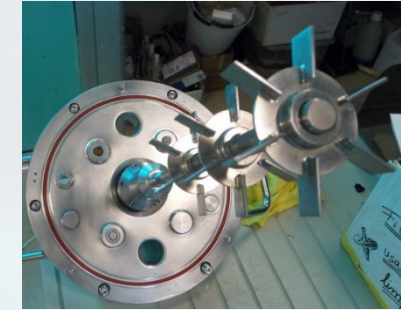
7 liters

**BioMixing** bioreactor



Patent pending

External validation



Original bioreactor

Our bioreactor gets a much more uniform distribution of smaller bubbles thanks to our agitation and aeration systems

**+ 90 % oxygen transfer**  
**- 50 % processing time**  
**With lower shear stress**



## Where are we?

- ✓ More than 20 years of experience
- ✓ Our simulations (CFD) have proven to fit very well real behavior of clients' new bioreactors and the **retrofitted** ones
- ✓ We have demonstrated high improvements in industrial fermentation via a design/service
- ✓ We are in the process of standarization our product







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