



# *scientifica*


*presenta le LEZIONI DI SCIENZA*  
*gli eventi di approfondimento sulle materie scientifiche*



**Fondazione  
Umberto Veronesi**  
– per il progresso  
delle scienze



**MONDADORI**  
**EDUCATION**



# Tra scienza ed etica: scopriamo assieme che cos'è la bioetica

Marco Annoni



Fondazione  
Umberto Veronesi  
— per il progresso  
delle scienze



EDUCATION



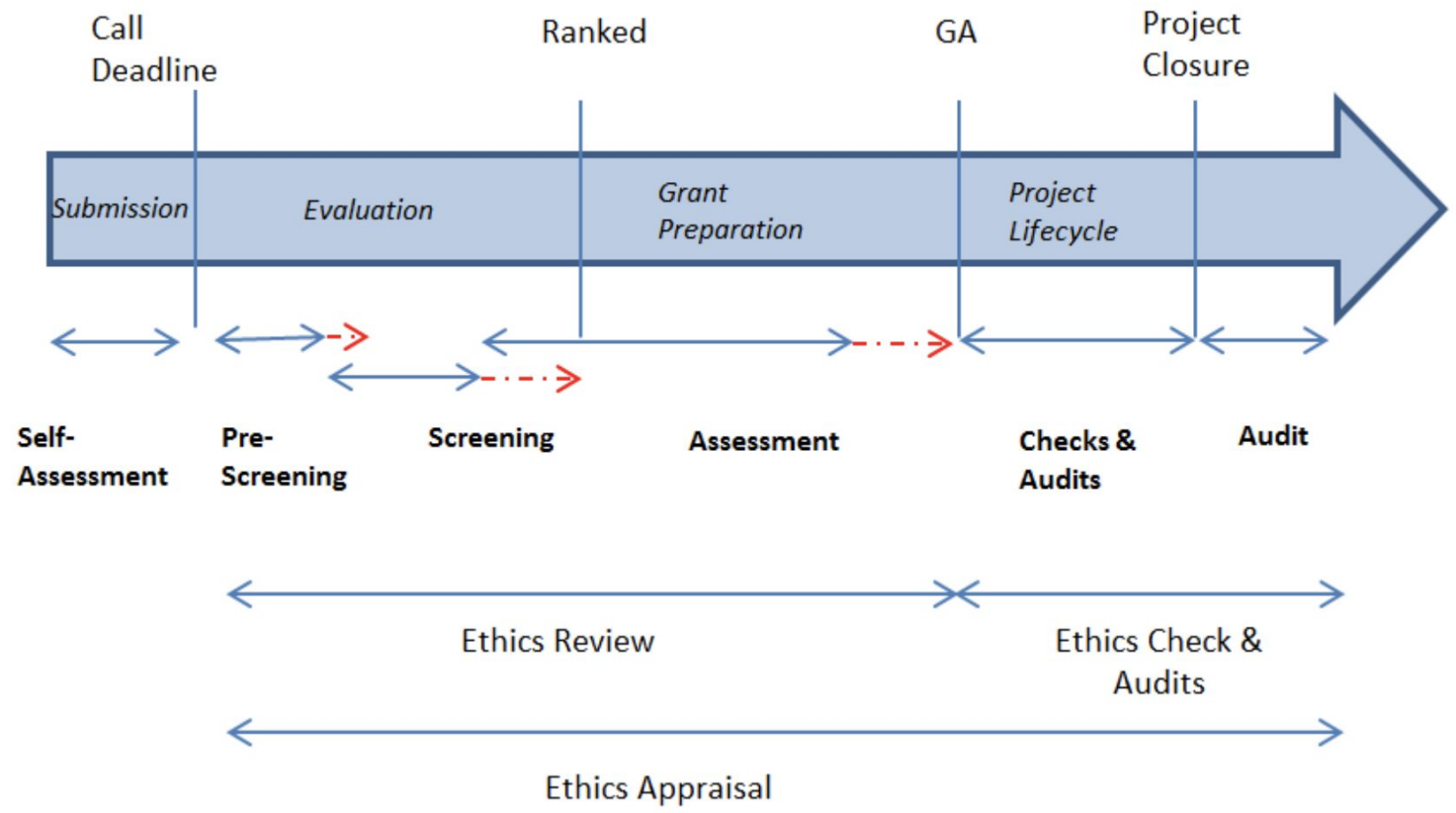
*scientifica*



# REAZIONE



# PREVENZIONE



# INTEGRAZIONE

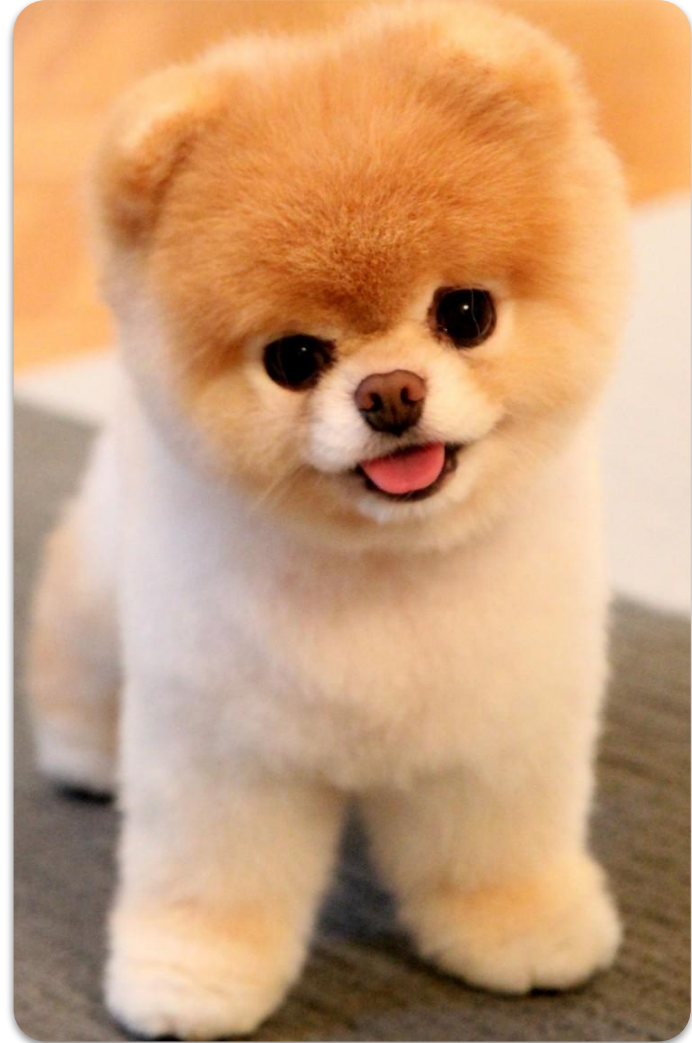


# 1. SCALA GLOBALE

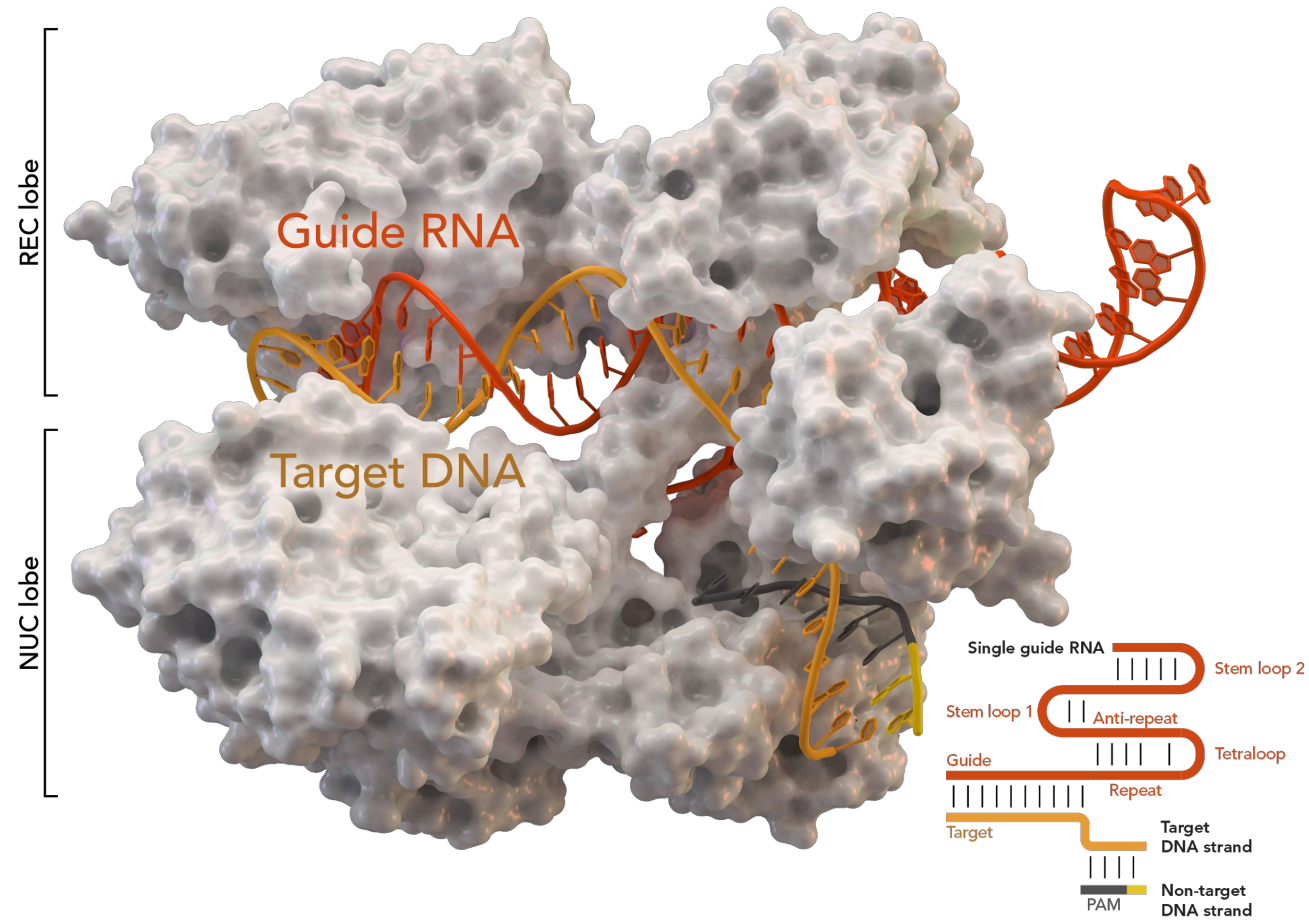


# 1. NUOVE DOMANDE



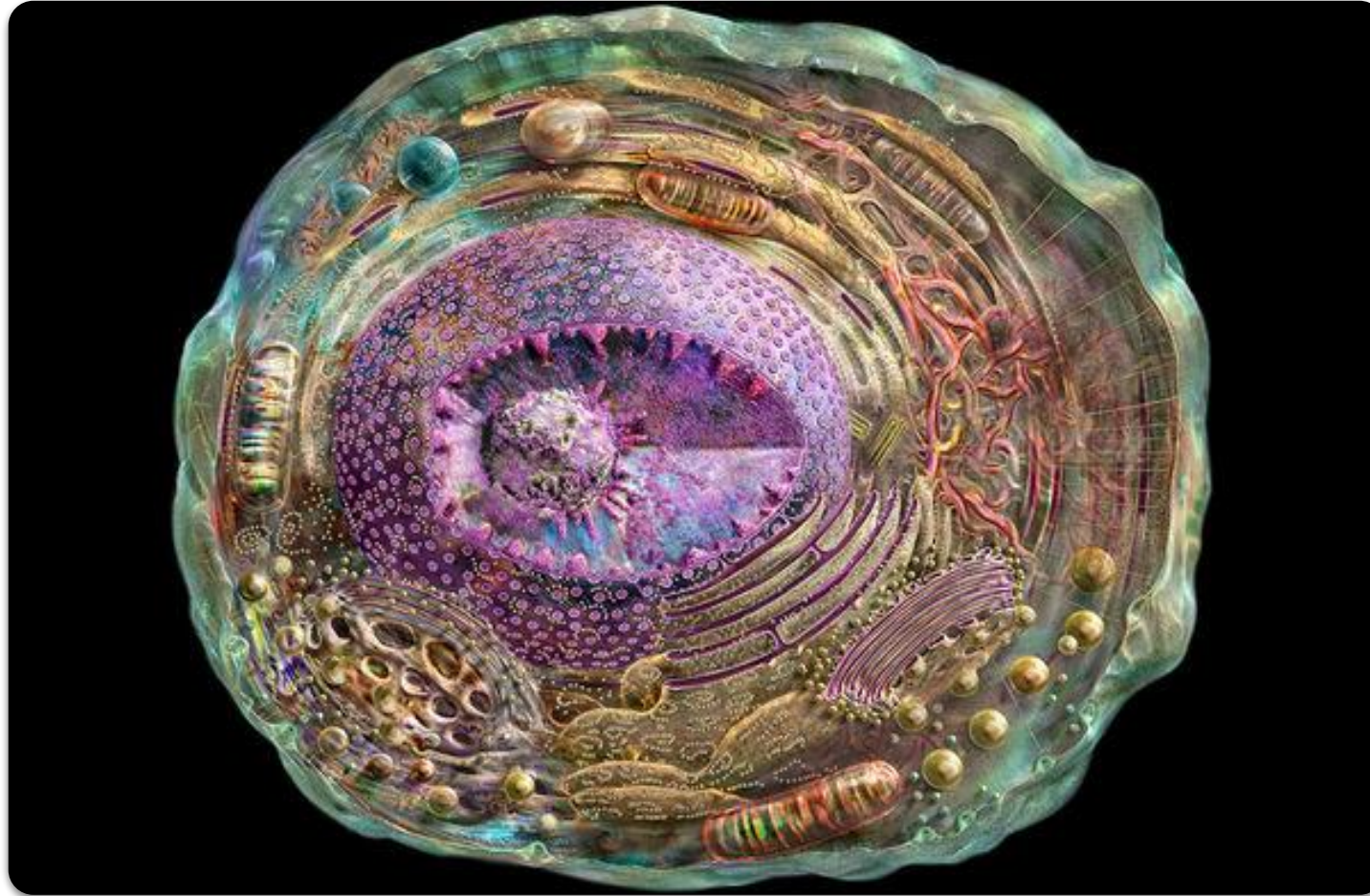


# CRISPR-CAS9



<i>In vivo</i> genome editing to target cancer and genetic diseases	Birth of an <i>in vitro</i> genome-edited human embryo	A new gene-drive insect species avoids insecticide use in agriculture	Transplantation of a gene-edited organ into a human's body
Commercialization of brand new gene-edited species resistant to pathogens	Gene-edited non-human primate to model a human disorder affecting a cognitive function	Gene-edited horses with enhanced speed and muscles	Companion dogs that are genome-edited to be more "calm" (or more playful)

# 1. CONOSCERE



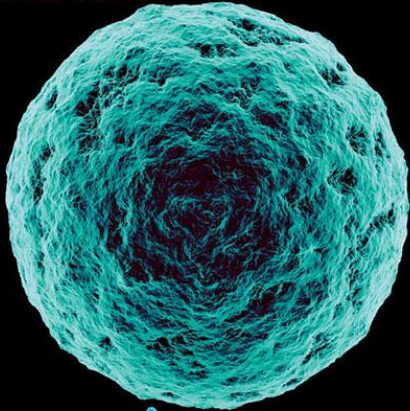


# 2. CURARE

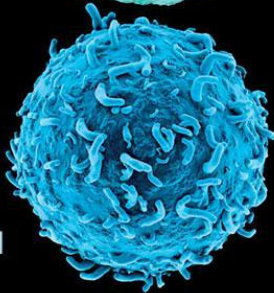
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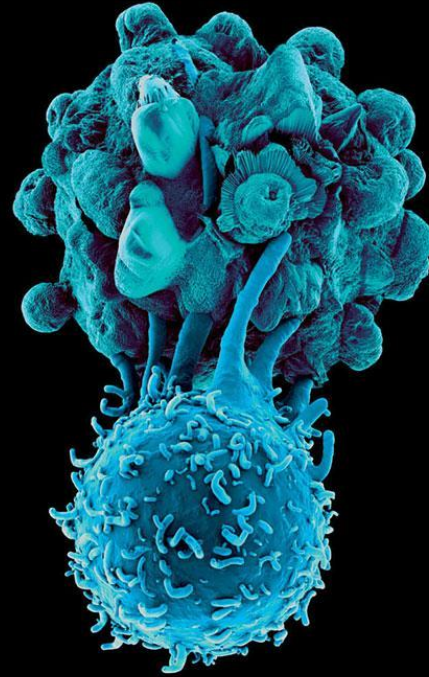
Cancer cell



T cell



T cell approaches cancer cell.



T cell attacks cancer cell.



Cancer cell destroyed.

## New WHO guidance on how to maintain essential health services during the pandemic

1 June 2020 – The guidance, published today, includes critical information for countries on how to safely maintain essential health services in the context of COVID-19. A dedicated chapter on malaria notes that, in some cases, exceptional measures may be recommended – such as presumptive malaria treatment and mass drug administration – with a view to reducing the strain that malaria places on health systems during the pandemic and rapidly driving down the malaria burden in populations at risk of the disease.

[Maintaining essential health services: operational guidance for the COVID-19 context](#)

[Remarks by the WHO Director-General](#)

[More information on the new guidance](#)



UNICEF/UNI309873/Frank Dejongh



### Cases

# 228 million

malaria cases worldwide in 2018

### Deaths

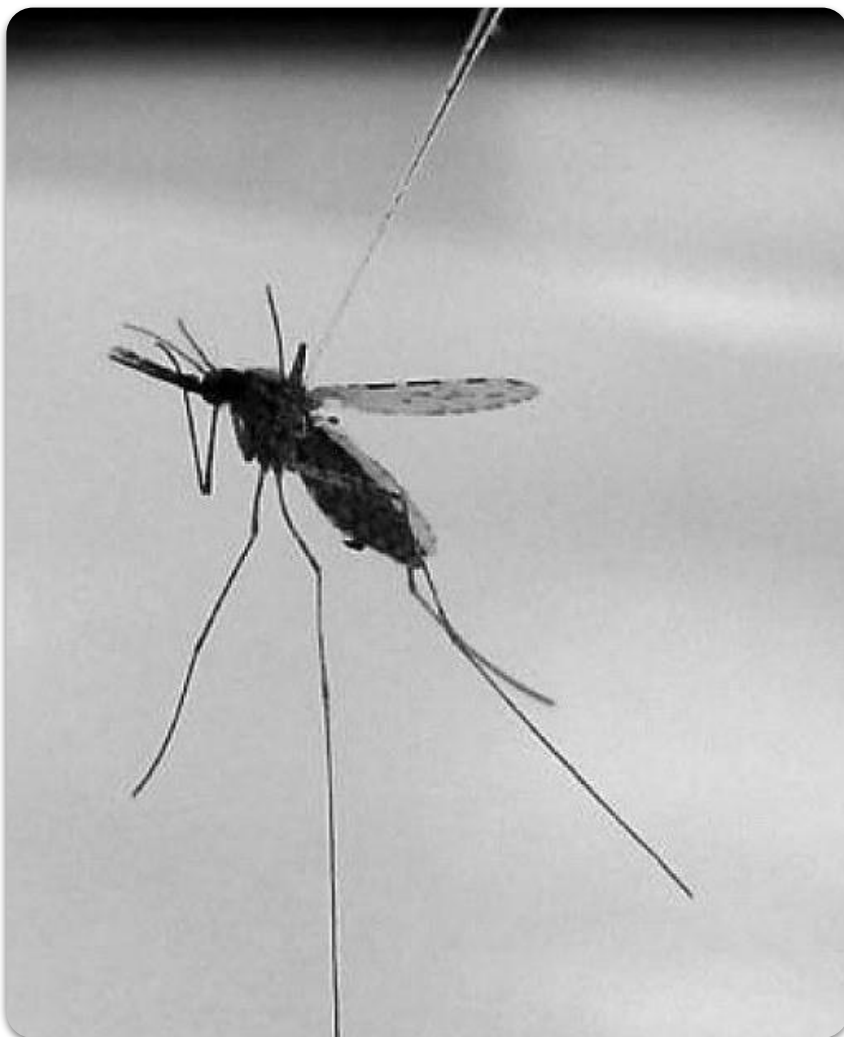
# 405 000

malaria deaths worldwide in 2018

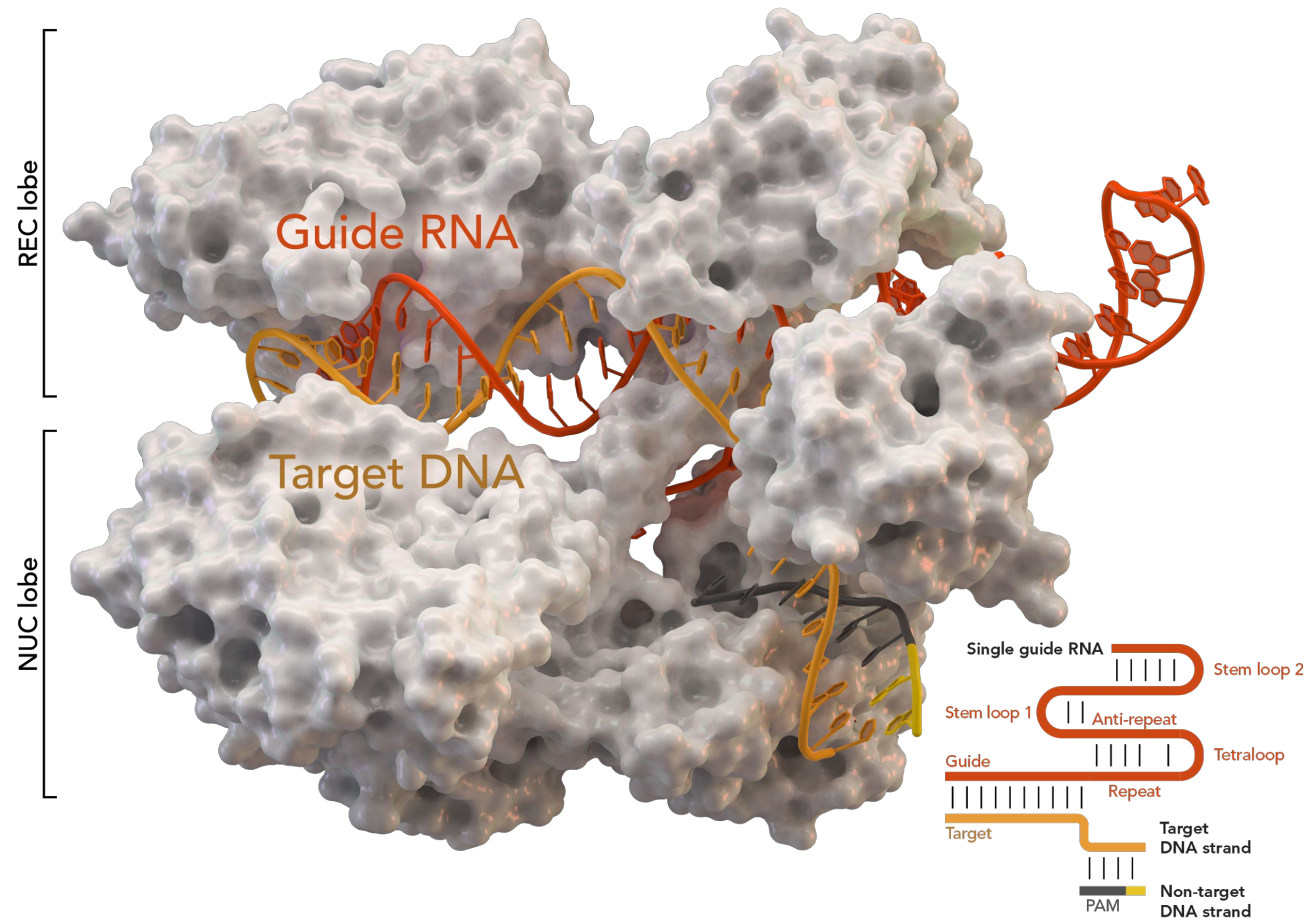
### Funding

# 2.7 billion

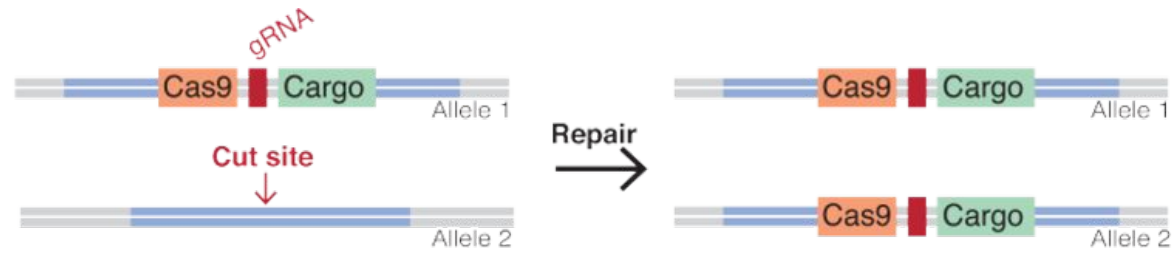
Resources available for malaria in 2018 (in US\$)



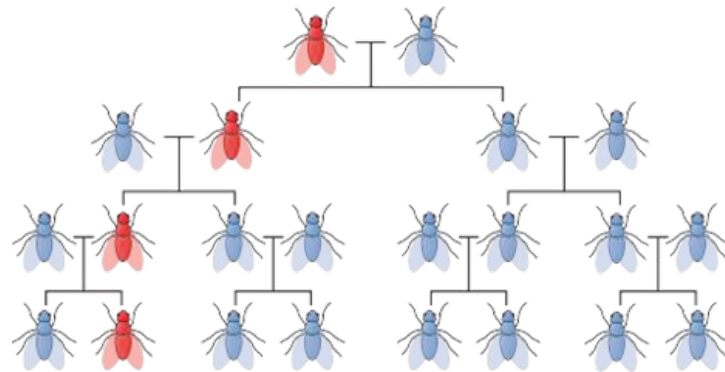
# CRISPR-CAS9



# GENE-DRIVE

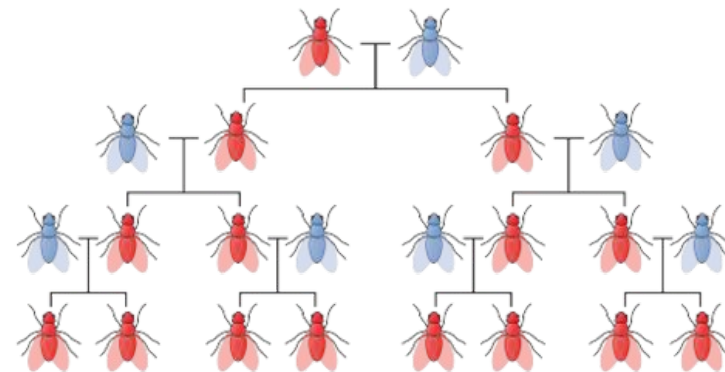


Normal inheritance



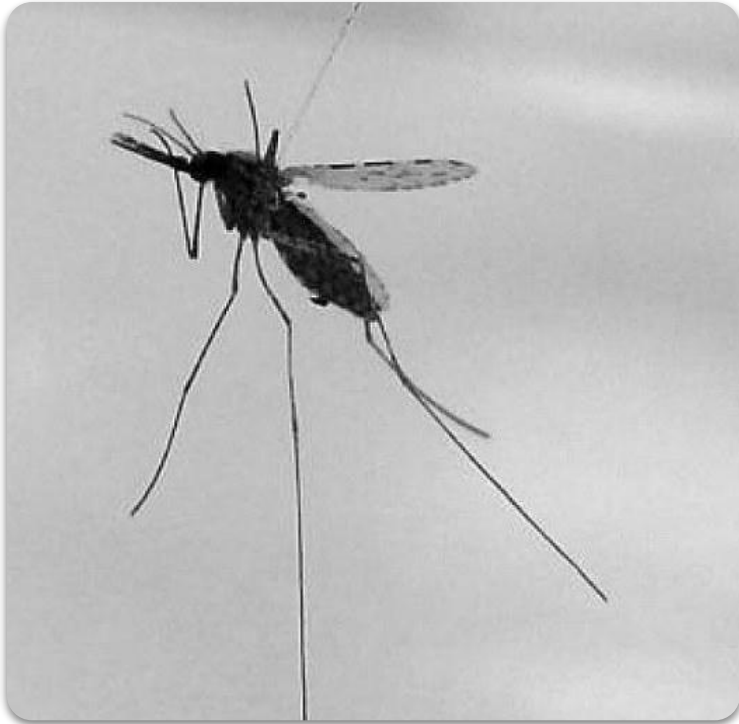
Altered gene does not spread

Gene drive inheritance



Altered gene is always inherited





I quaderni

# **GENE-DRIVE E RESPONSABILITÀ ECOLOGICA**

Parere del Comitato Etico



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**BioLaw Journal**  
Rivista di BioDiritto

1 | 21



Editoriali || Vaccines and solidarity  
A.I. and fundamental rights  
Focus || Fra biologico e artificiale  
Saggi e commenti

The online Journal about law and life sciences



# 3. MIGLIORARE



# THE HARVARD MOLECULAR LAB

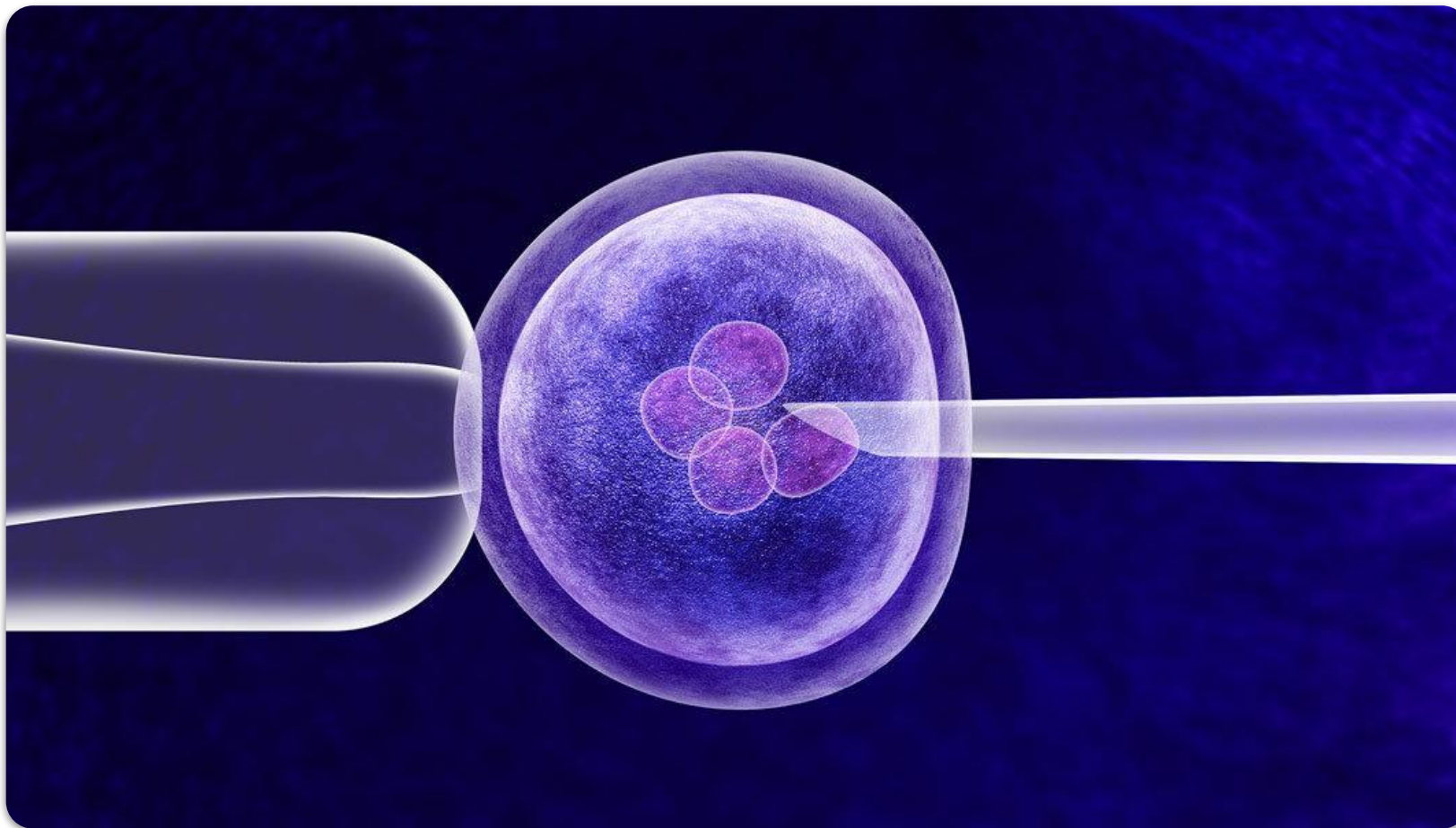
Gene	Genotype	Protective, resilient or extreme effects	Potential Negatives
LRP5	G171V/+	Extra-strong bones	Low Buoyancy
MSTN	-/-	Large, lean muscles, low atherosclerosis	
SCN9A	-/-	Pain insensitive	Unnoticed harm
FAAH-OUT	del/del	Pain insensitive	Unnoticed harm
NTRK1	del/del	Pain insensitive, no sweat	Unnoticed harm, hyperthermia
HSD17B13	+/TA(lof)	Low Chronic Liver Disease	
HOXA11	unstated	Augmented manipulation ability with six-fingered hands	
ABCC11	-/-	Low odor production	
PRNP	G127V	Prion resistance	
IFNL4	dG/TT	High Hepatitis C virus clearance	
CCR5	-/-	HIV resistance	W.Nile Virus & flu; bone
FUT2	-/-	Norovirus resistance	Crohn's disease
IL23R	R381Q/+	IBD: Crohn's disease, Ulcerative colitis	
HBB	E6V/+	Malaria resistance	Exertional rhabdomyolysis
PKU	+/-	Ochratoxin resistance	
CFTR	+/-	TB or other	
HEXA	+/-	TB resistance	



**1. INUTILE**

**2. PERICOLOSO**

**3. ILLEGALE**



# +10 ANNI < GOVERNANCE

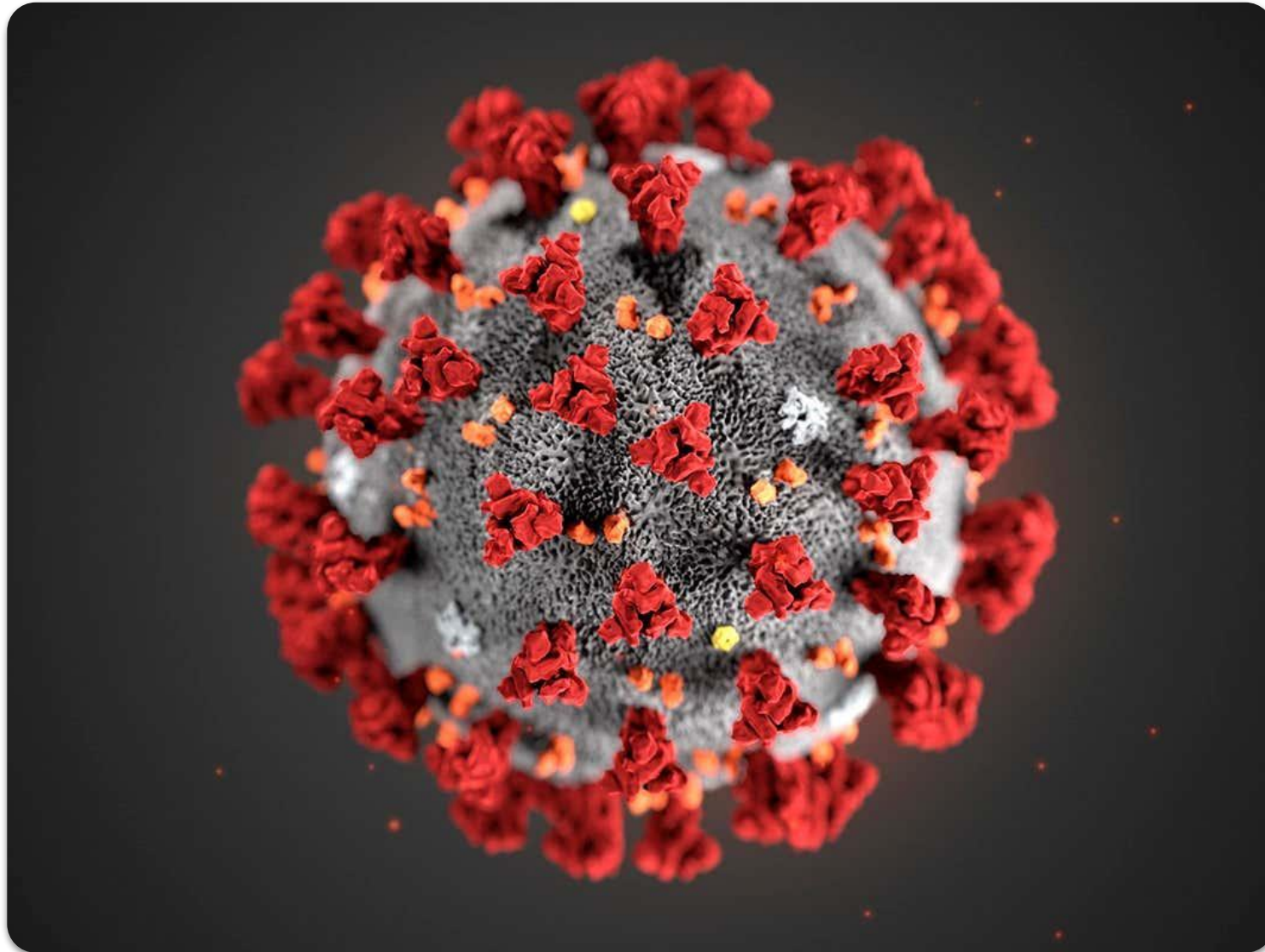
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## **L' EDITING DEL GENOMA UMANO TRA ETICA E DEMOCRAZIA**

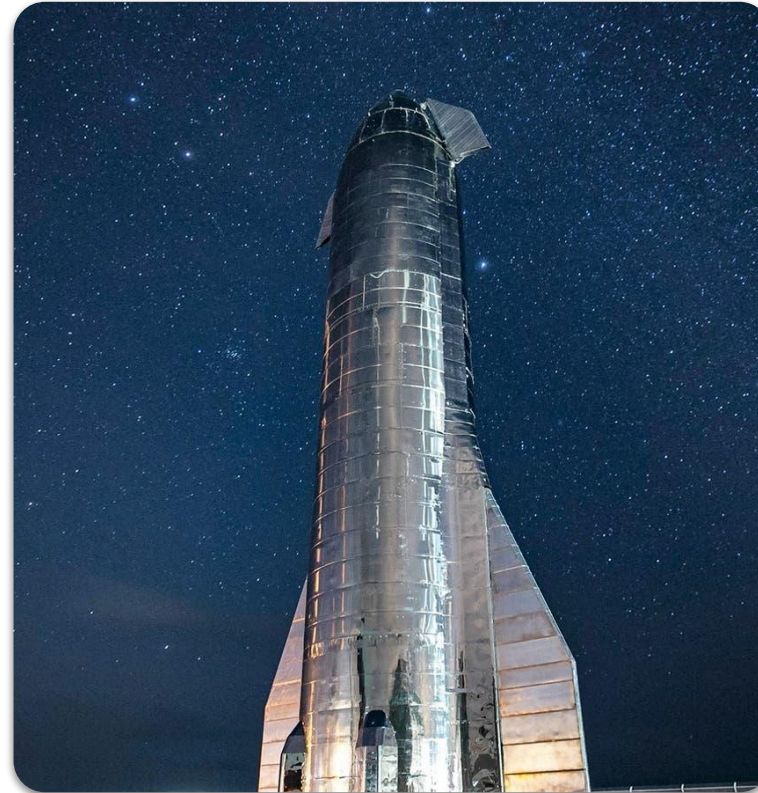
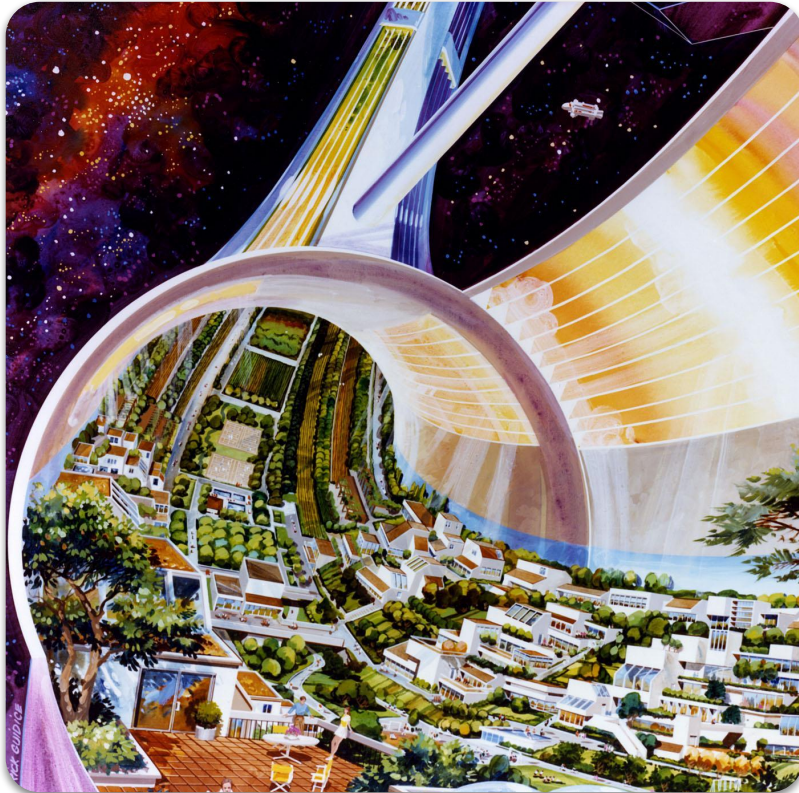
*Parere del Comitato Etico*



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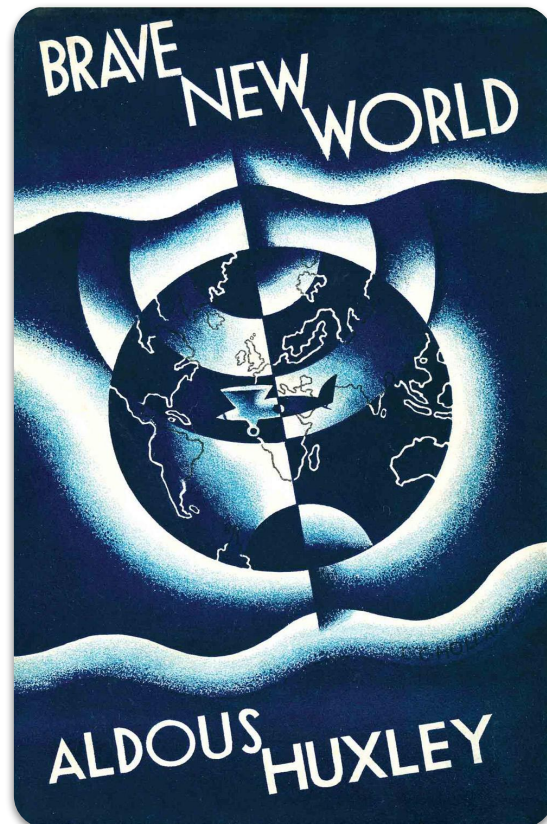


# + 100 ANNI > IMMAGINAZIONE





# + 100 ANNI > IMMAGINAZIONE



# ***Grazie***

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.....

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