

Syllabus

role of synthetic biology in
medicine

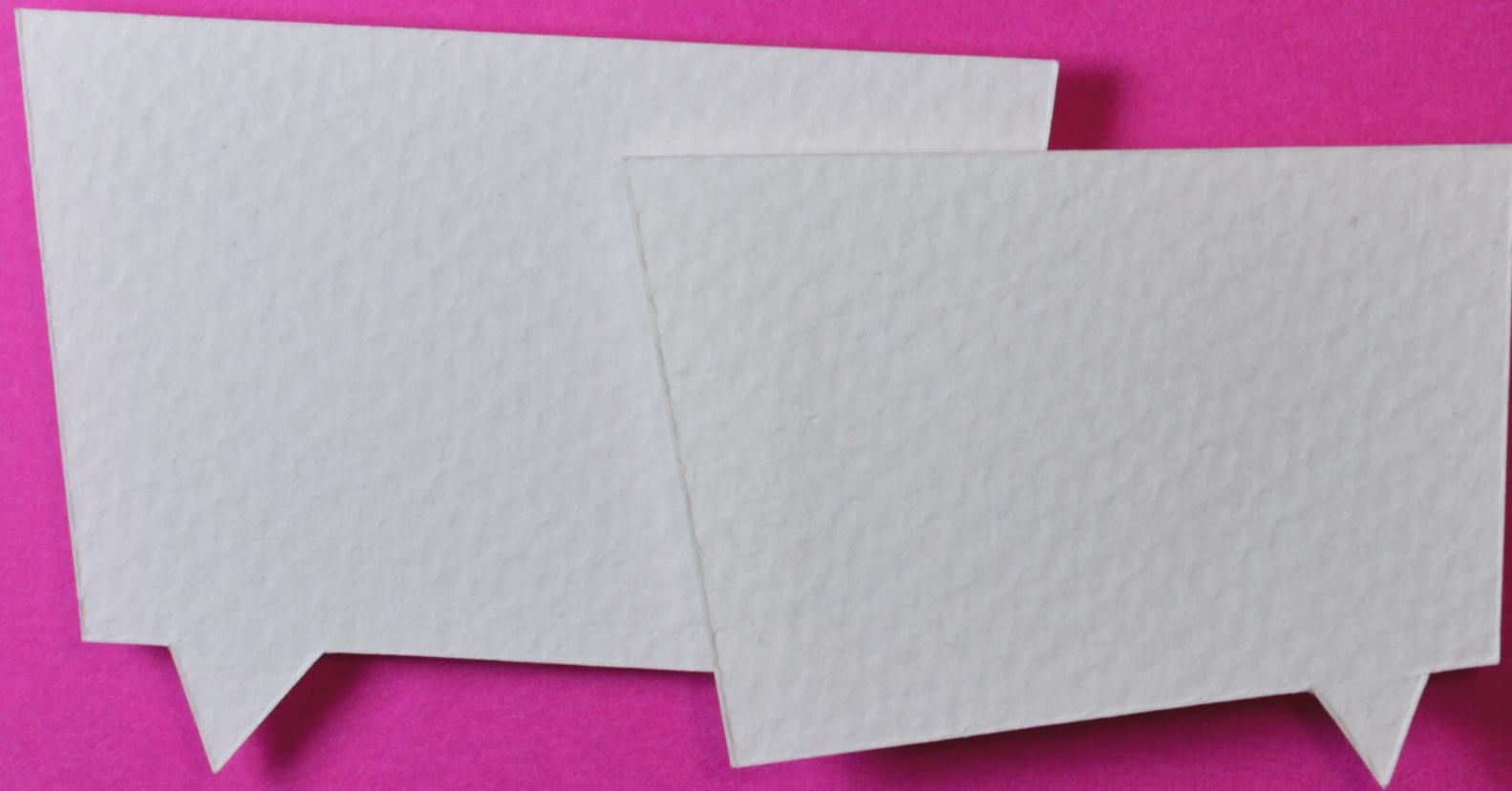
CRISPR technology in the fight
against COVID-19

gene-editing technologies

exploring some ethical
considerations of synthetic
biology in medicine

Week 2: Medicine and Gene-editing Technologies

w/ Shaira Gozun and Anna Beatriz Suavengco

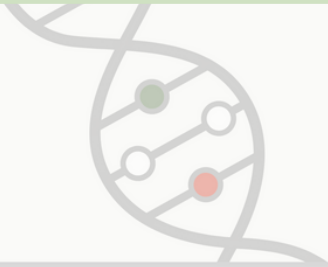


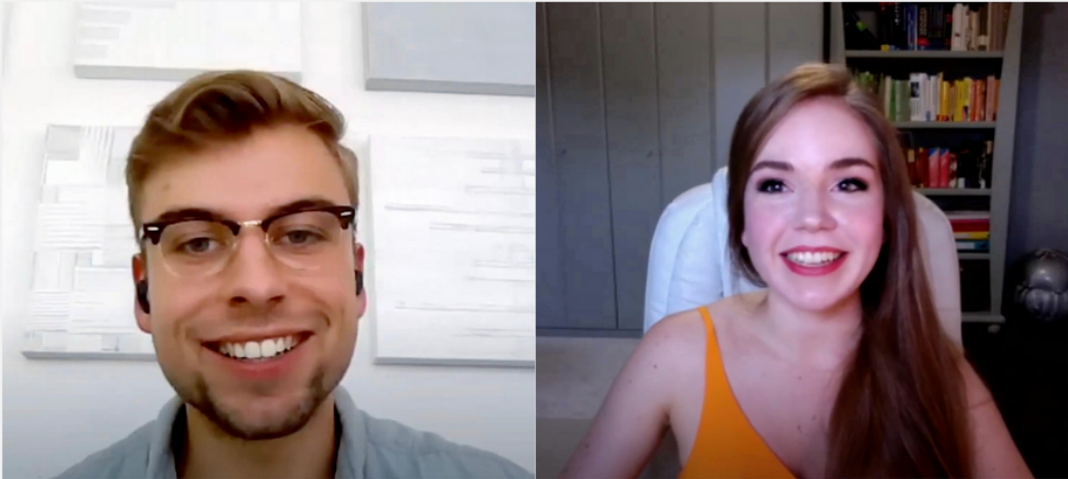
Introduce yourself
in the Zoom chat!

Throwback

- the science of synthetic biology and its ethical implications

ONLINE
COURSE
BUZZ ONLINE







Week 1

Introduction to
Synthetic Biology

6 WEEKS - 6 CLASSES - 4 FREE

Started August 29, Saturdays - 10AM ET

SCENARIOS

B



access to buying genes (DIY biology) available for everyone

C



genetically engineer endangered species for the purpose of preservation (by increasing its fitness)

INTRO TO
SYNTHETIC
BIOLOGY

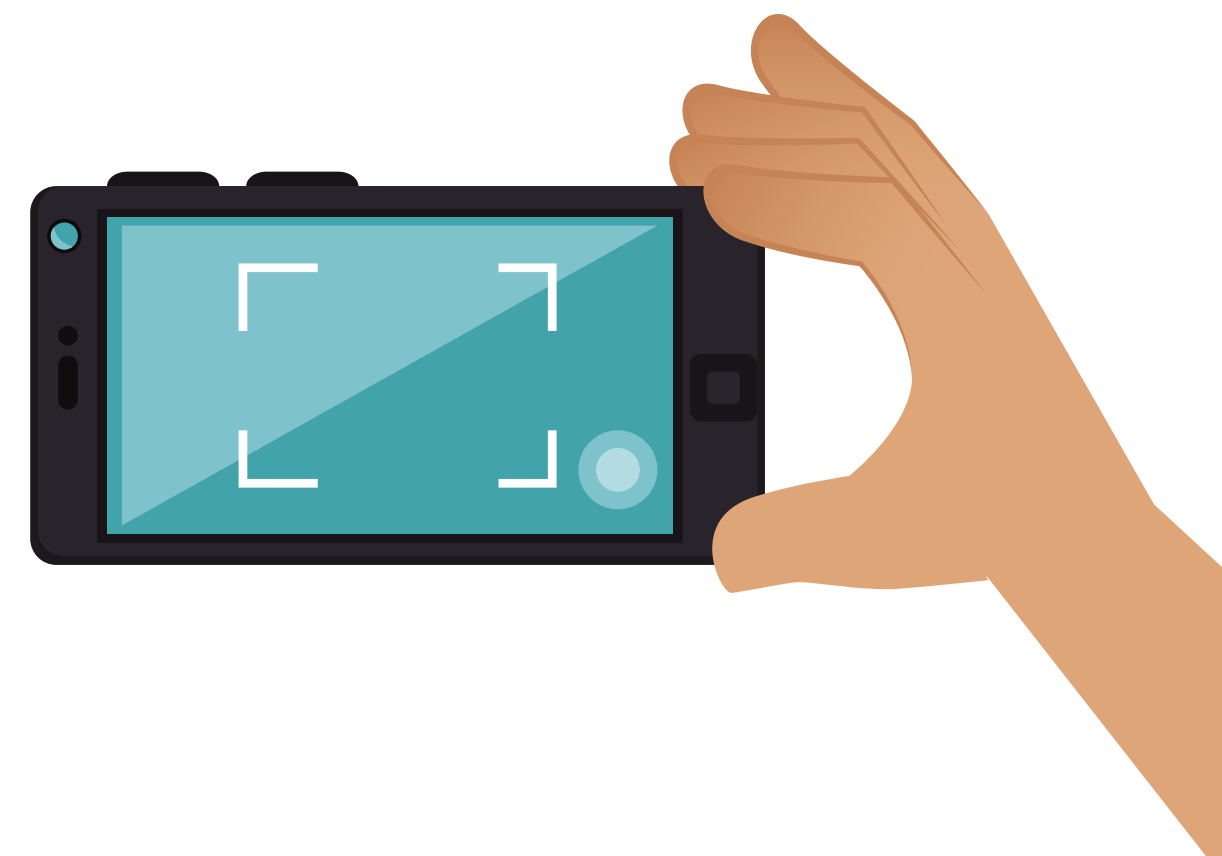
Thank you, everyone!



INTERNATIONAL
CLASS



QR Code!



Go to www.menti.com and use the code 55 73 78 9

BUZZ ONLINE X SYNTHETHICS



 Menti

For you, what is the highlight of last week's lecture?

Press **ENTER** to pause scroll



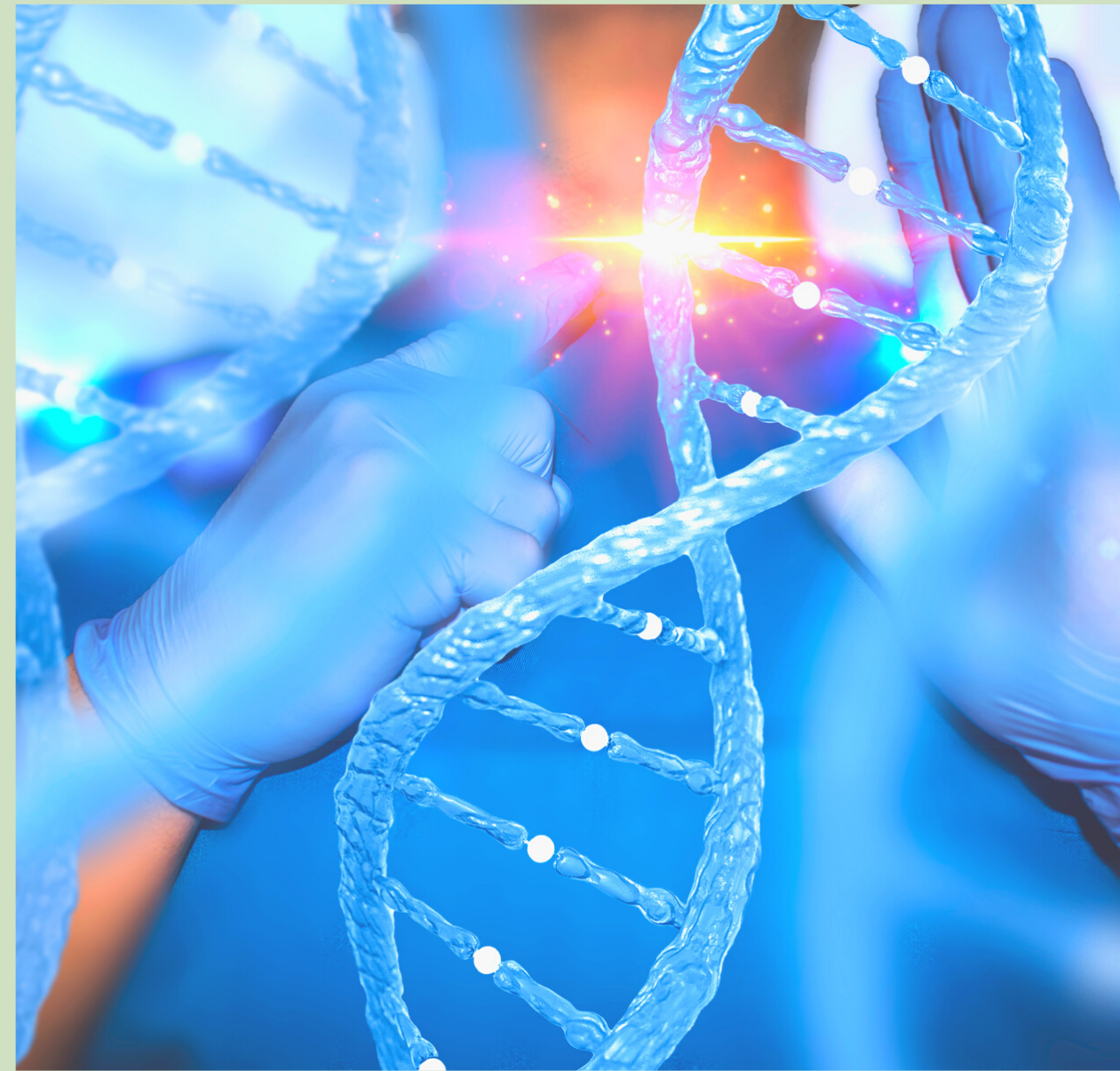
Meet Week 2's Mentors!



hello

Synthetic Biology in Medicine

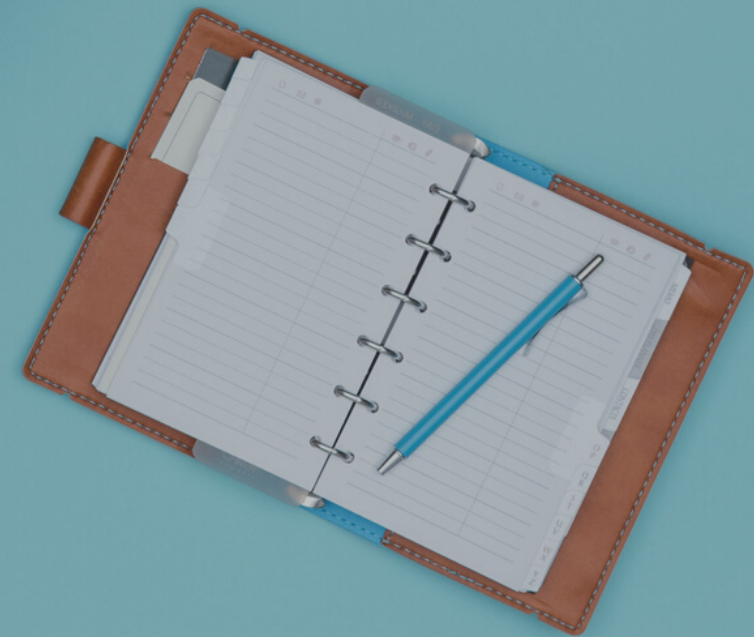
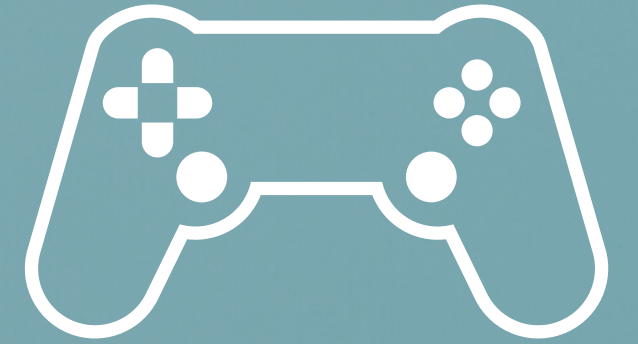
- new technologies - improvements in healthcare



ADVANCES IN
BIOMEDICINE



Go to kahoot.it and
enter our game pin!



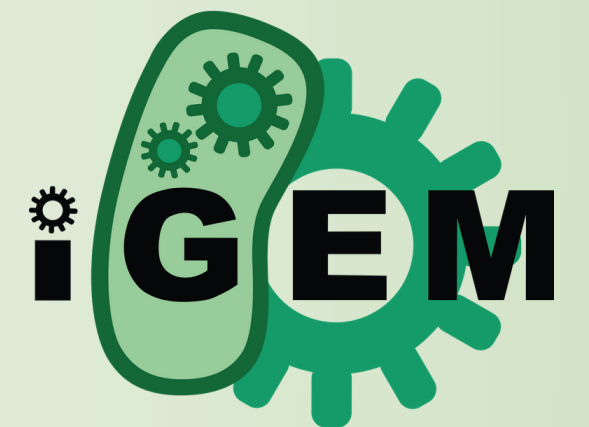
iGem stands for:

A, INTERNATIONAL GENE EDITING AND MODIFICATION

B, INTERNATIONAL GENOME EDITING MACHINE

C, INTERNATIONAL GENETICALLY ENGINEERED MACHINE

D, INTERNATIONAL GENE-EDITED MACHINE



The process when a gene of a person is taken, altered, and genetic defects are corrected thus preventing or curing a genetic disease:

A, GENE EDITING

B, GENE THERAPY

C, GENE ALTERATION

D, GENE DISEASE PREVENTION

Through this, we reprogram and enhance the function of the person's immune cells:

A, GENE IMMUNOLOGY

B, GENE EDITING IN IMMUNOLOGY

C, IMMUNOLOGY PROGRAMMING

D, SYNTHETIC IMMUNOLOGY

Medicine



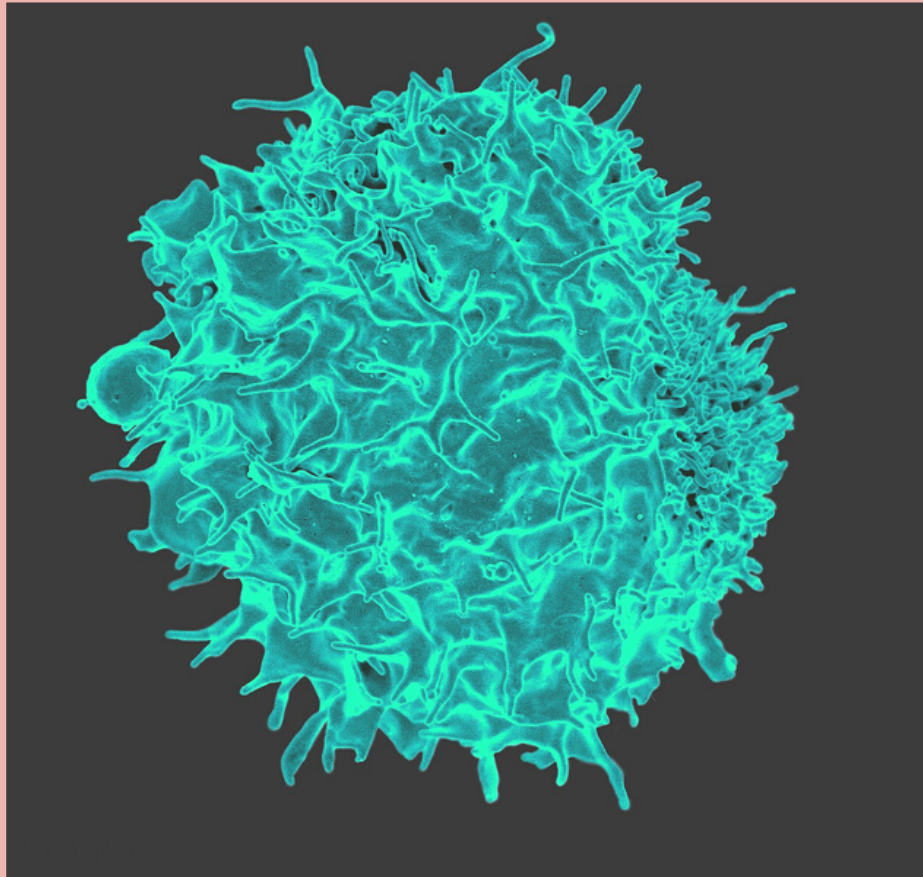
Medicine



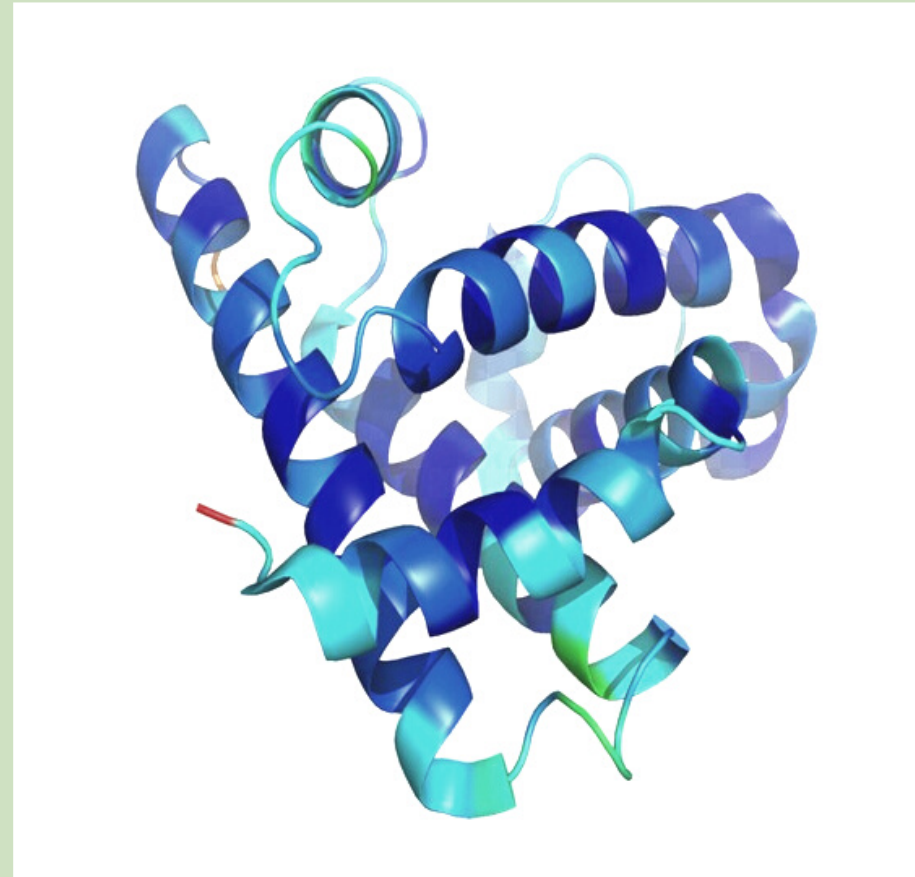
LET'S LEARN!



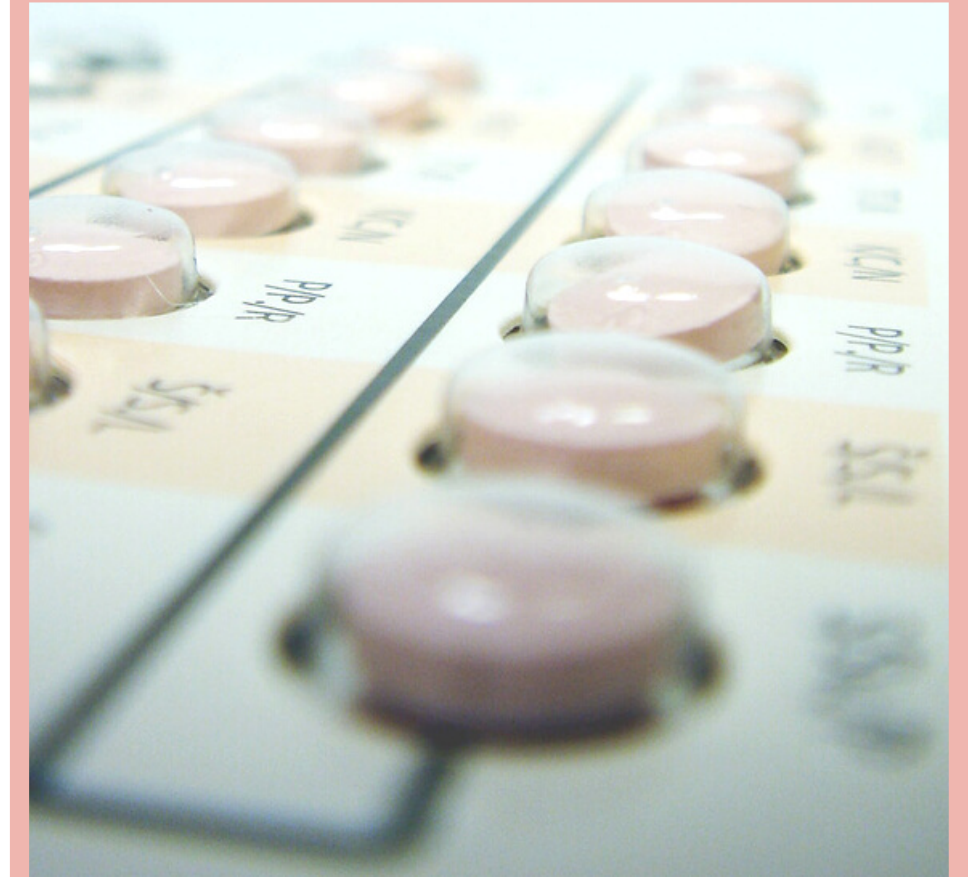
Medicine



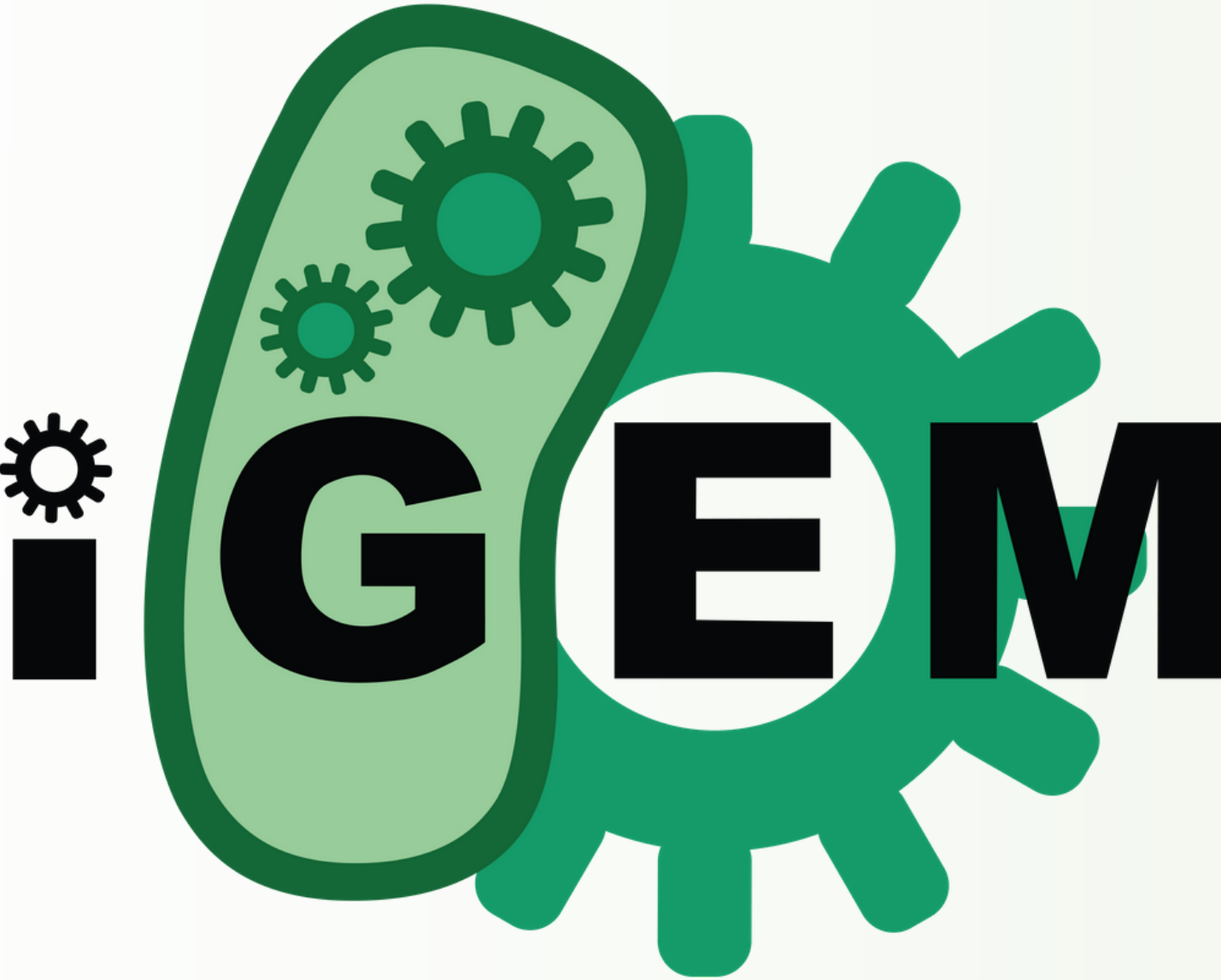
GENE
THERAPY



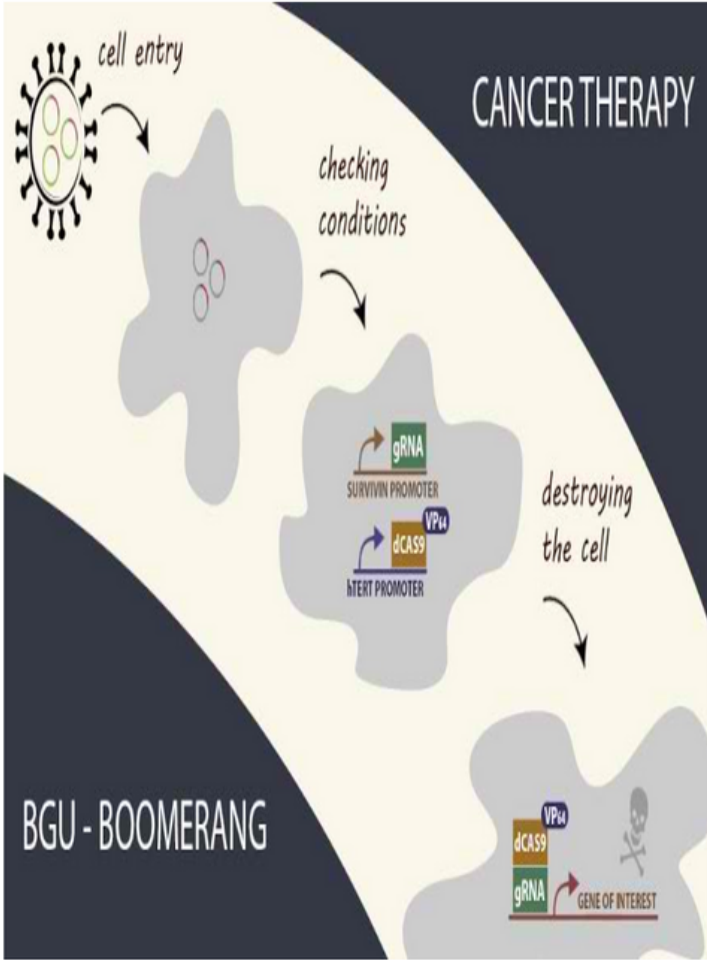
SYNTHETIC
IMMUNOLOGY



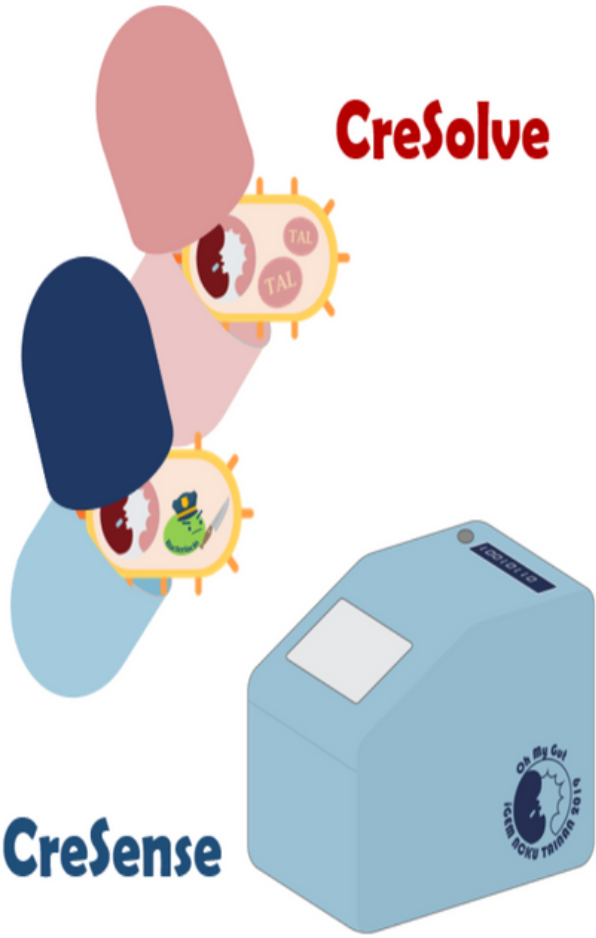
DRUG
DISCOVERY



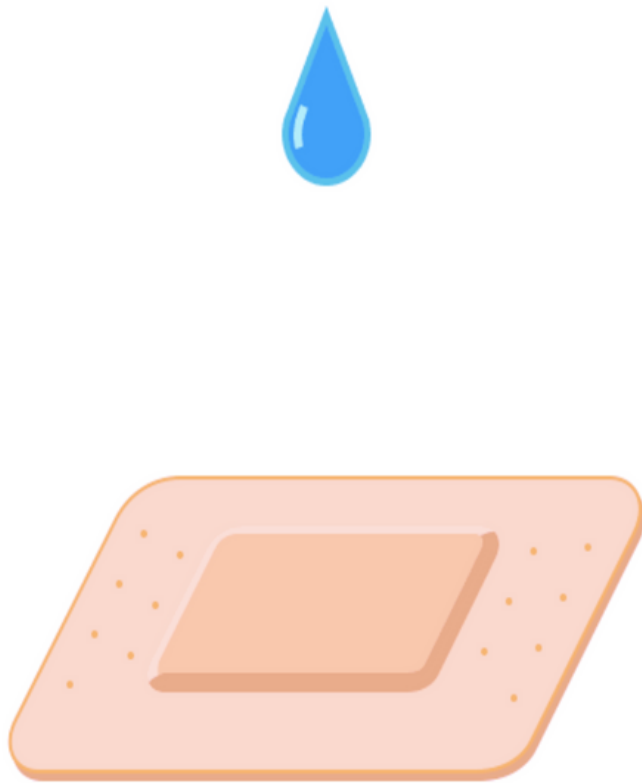
iGEM Projects



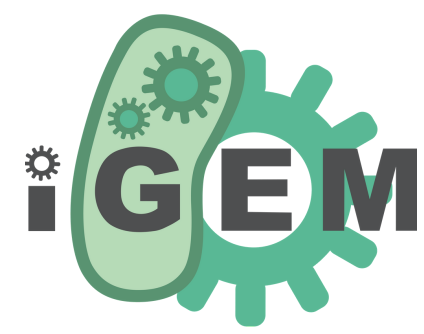
BOOMERANG
TEAM BGU



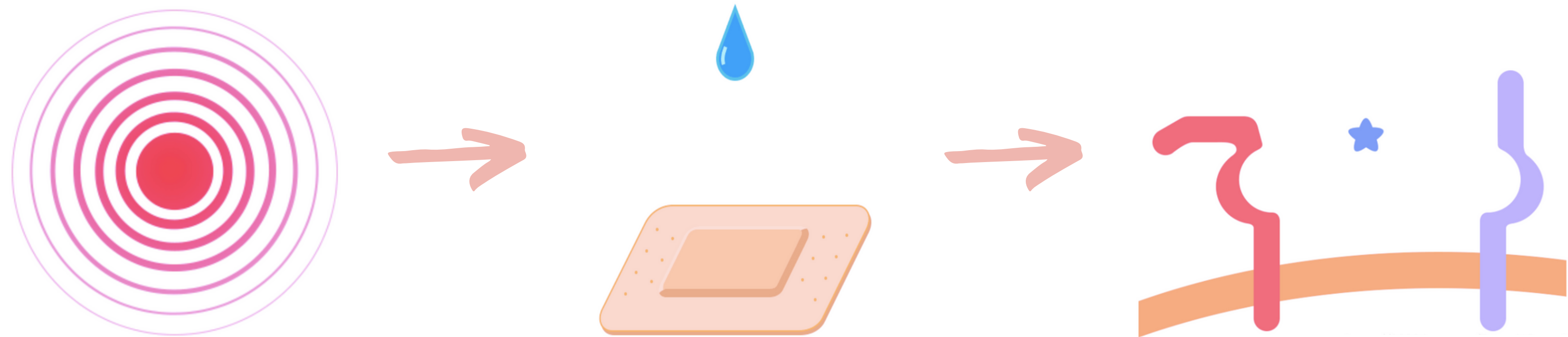
OH MY GUT
NCKU TAINAN



CIDOSIS
COPENHAGEN

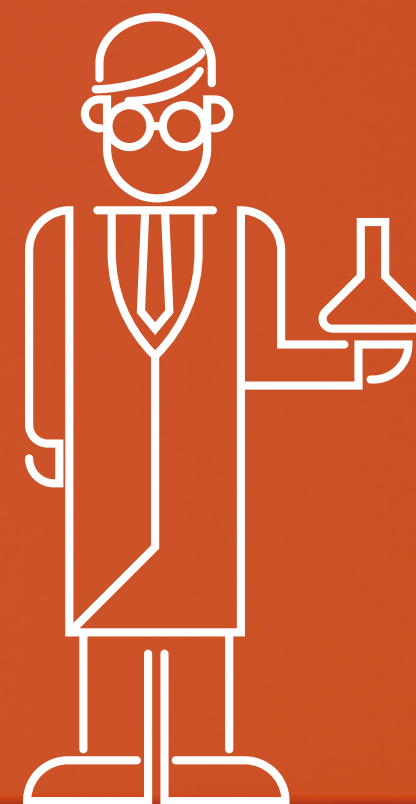


Project Copenhagen





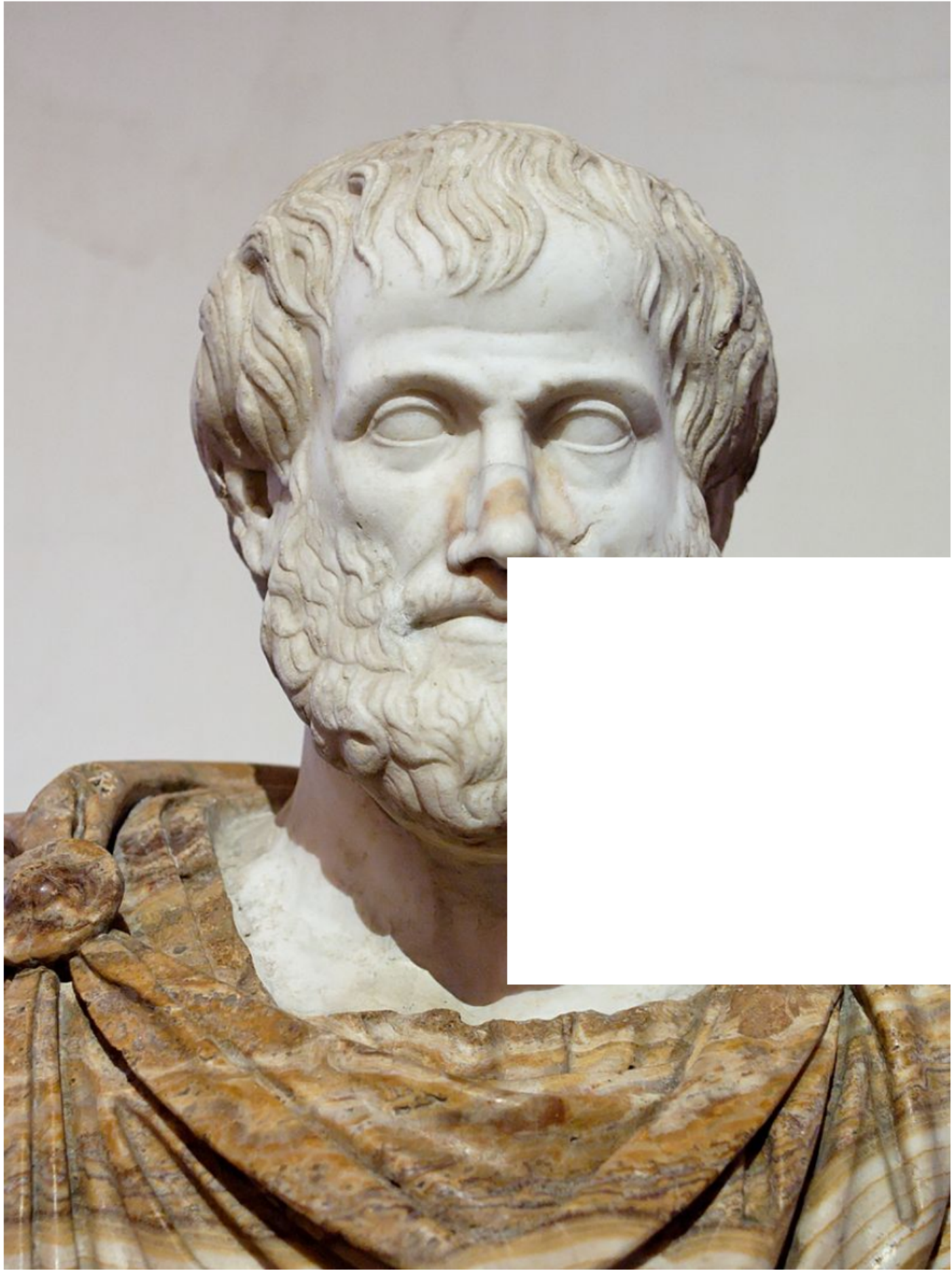
Guess the Scientist!











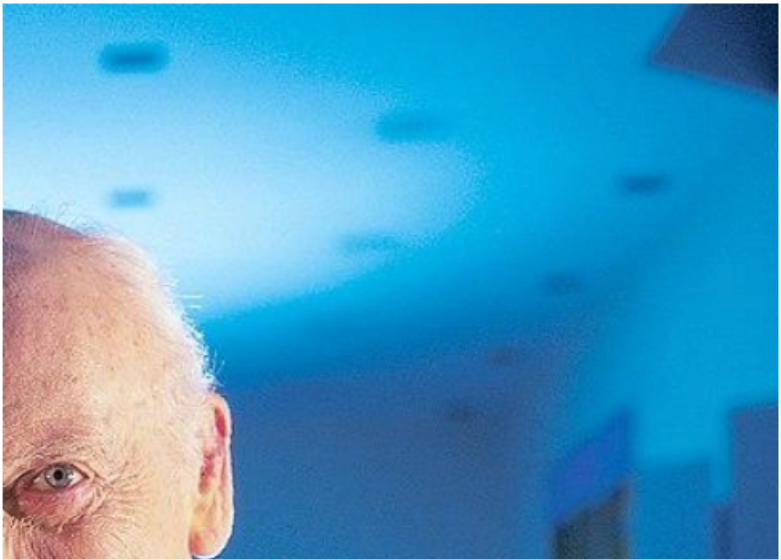


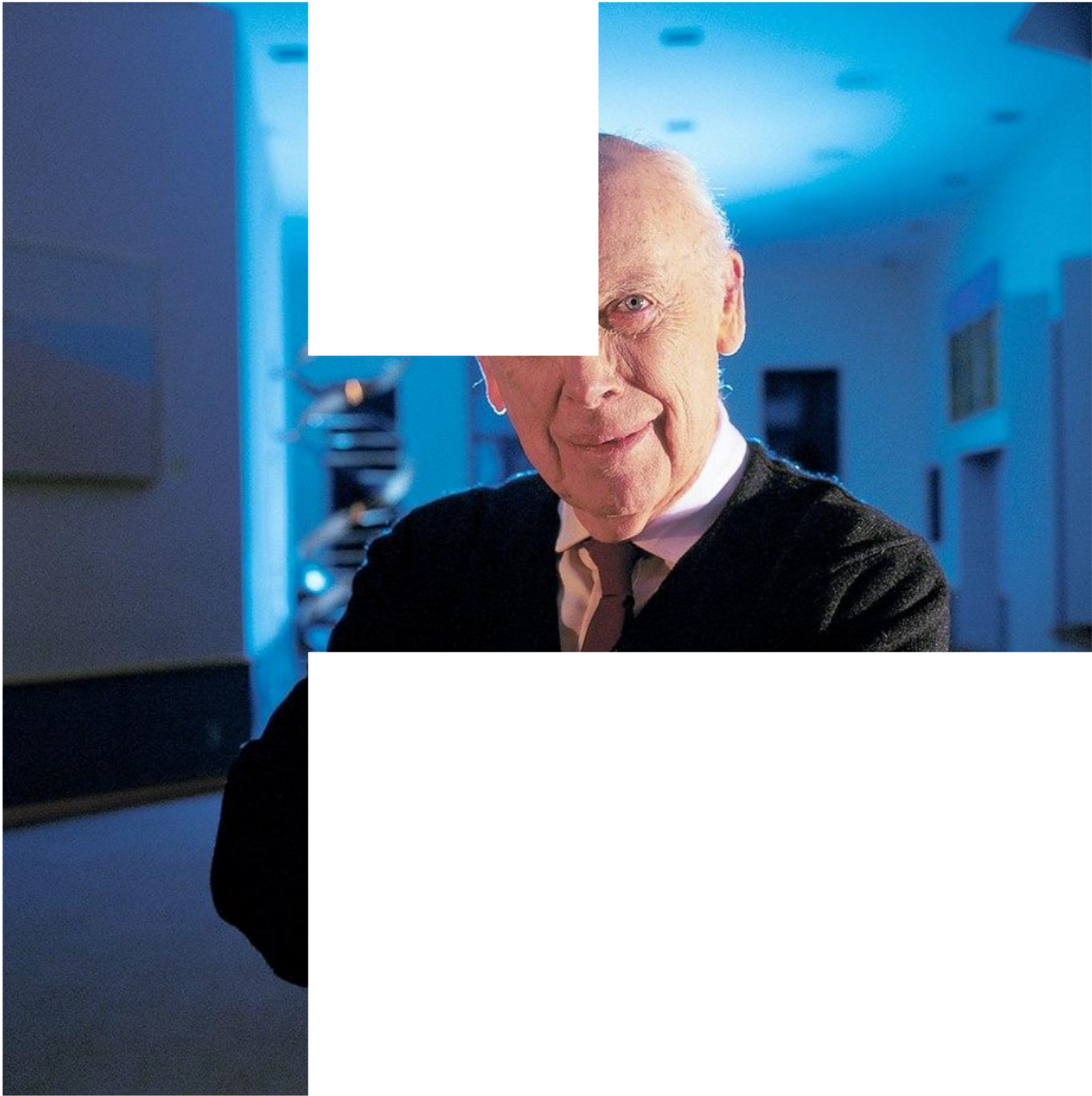


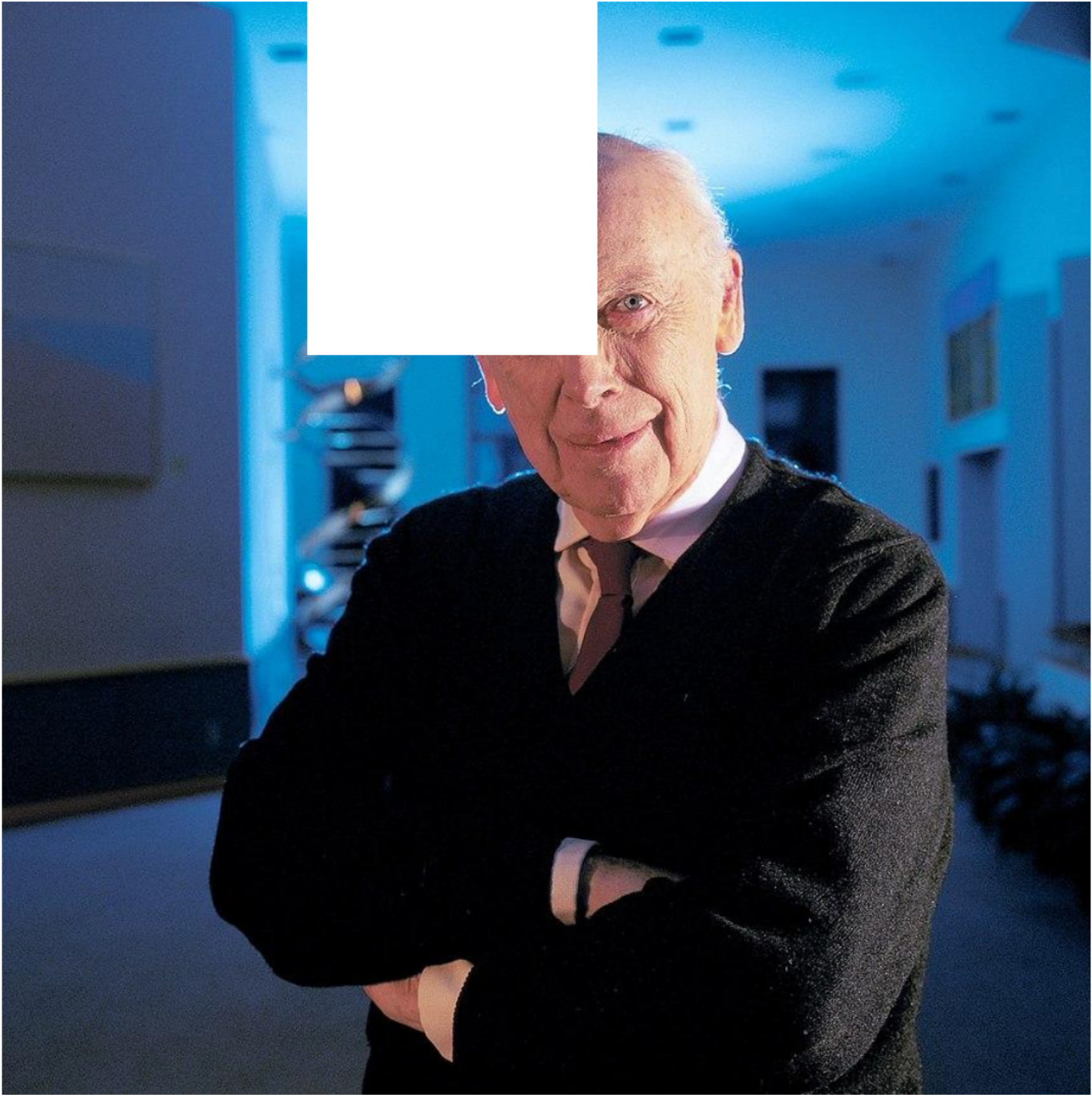
Aristotle



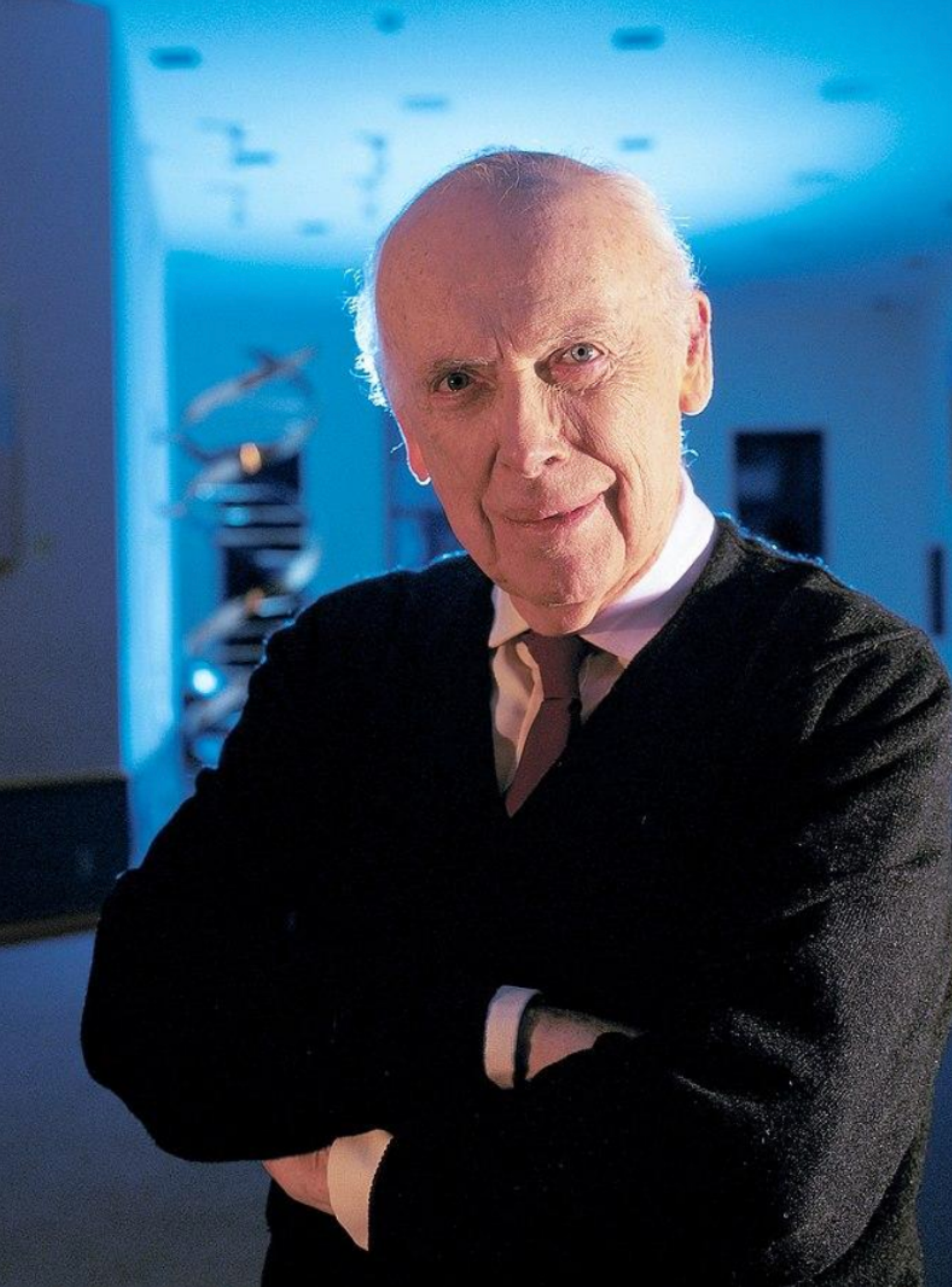










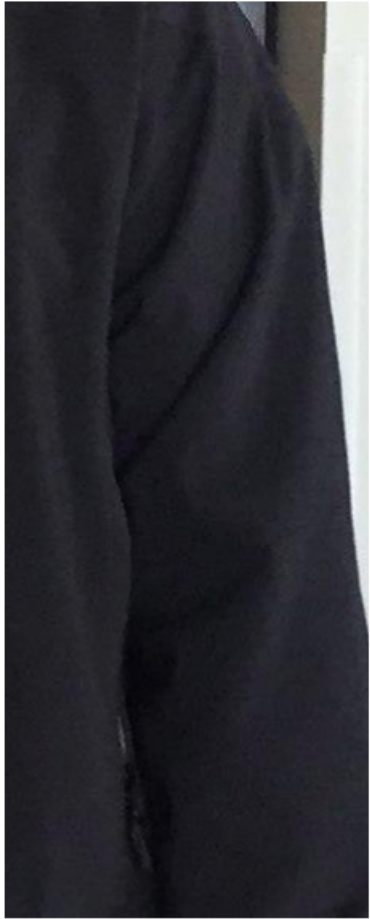
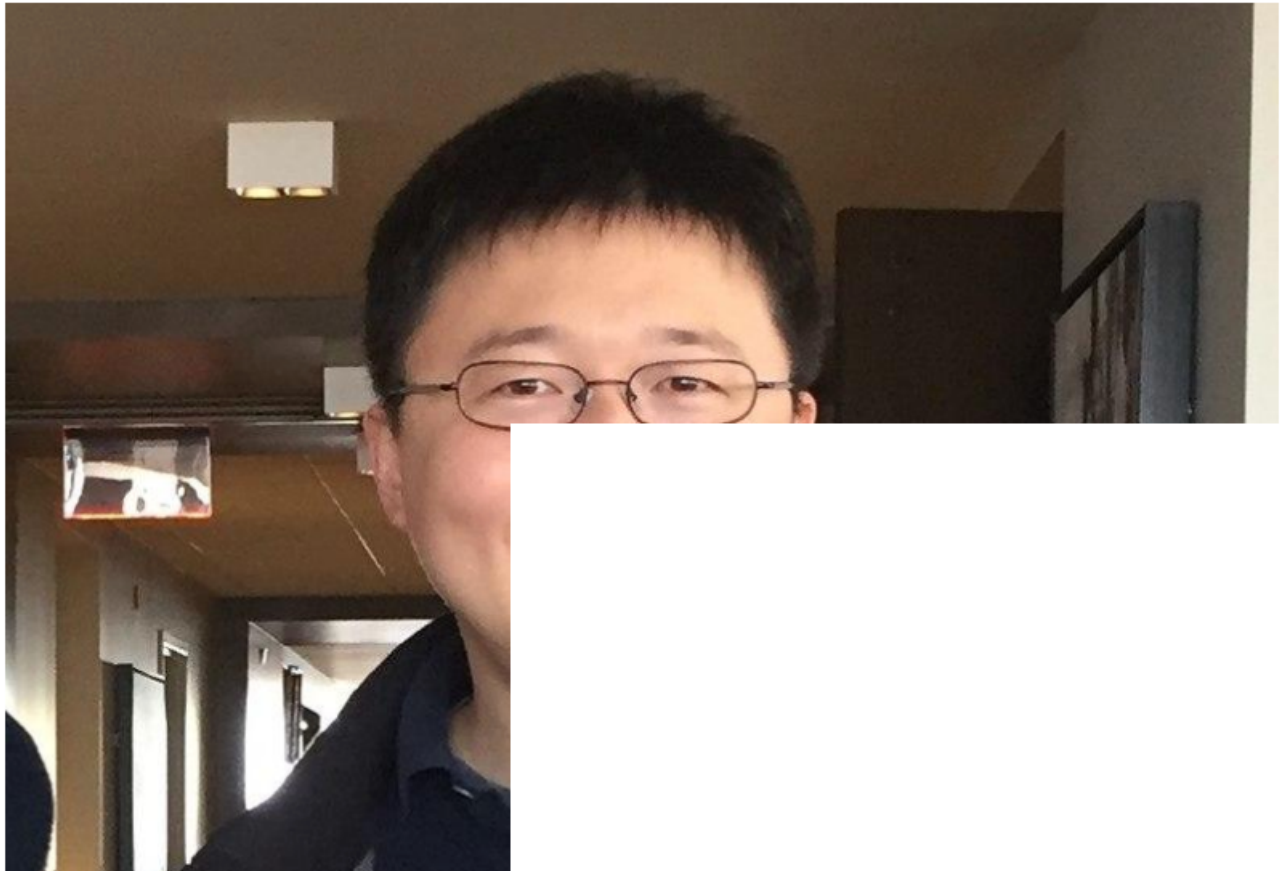


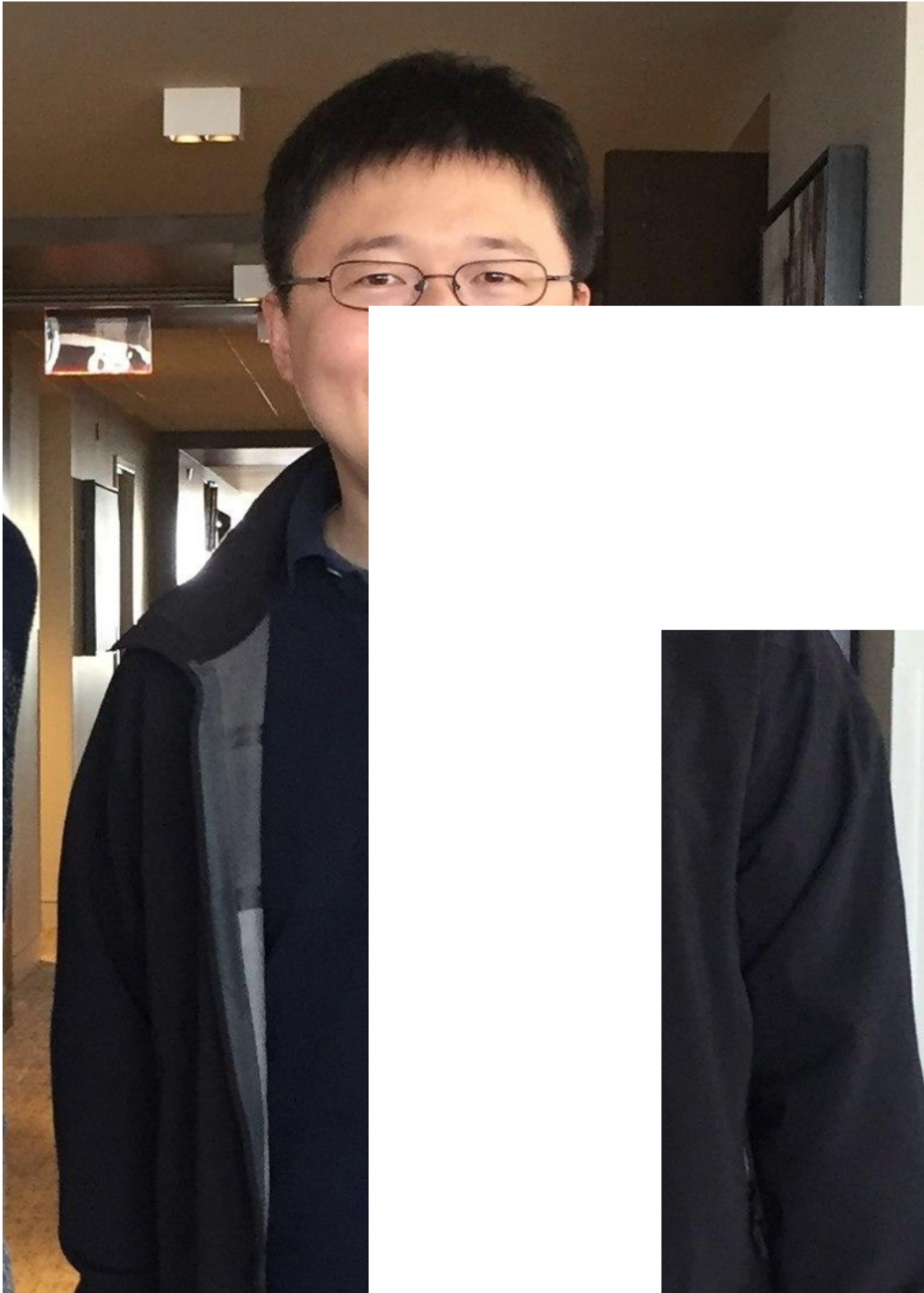
James Watson

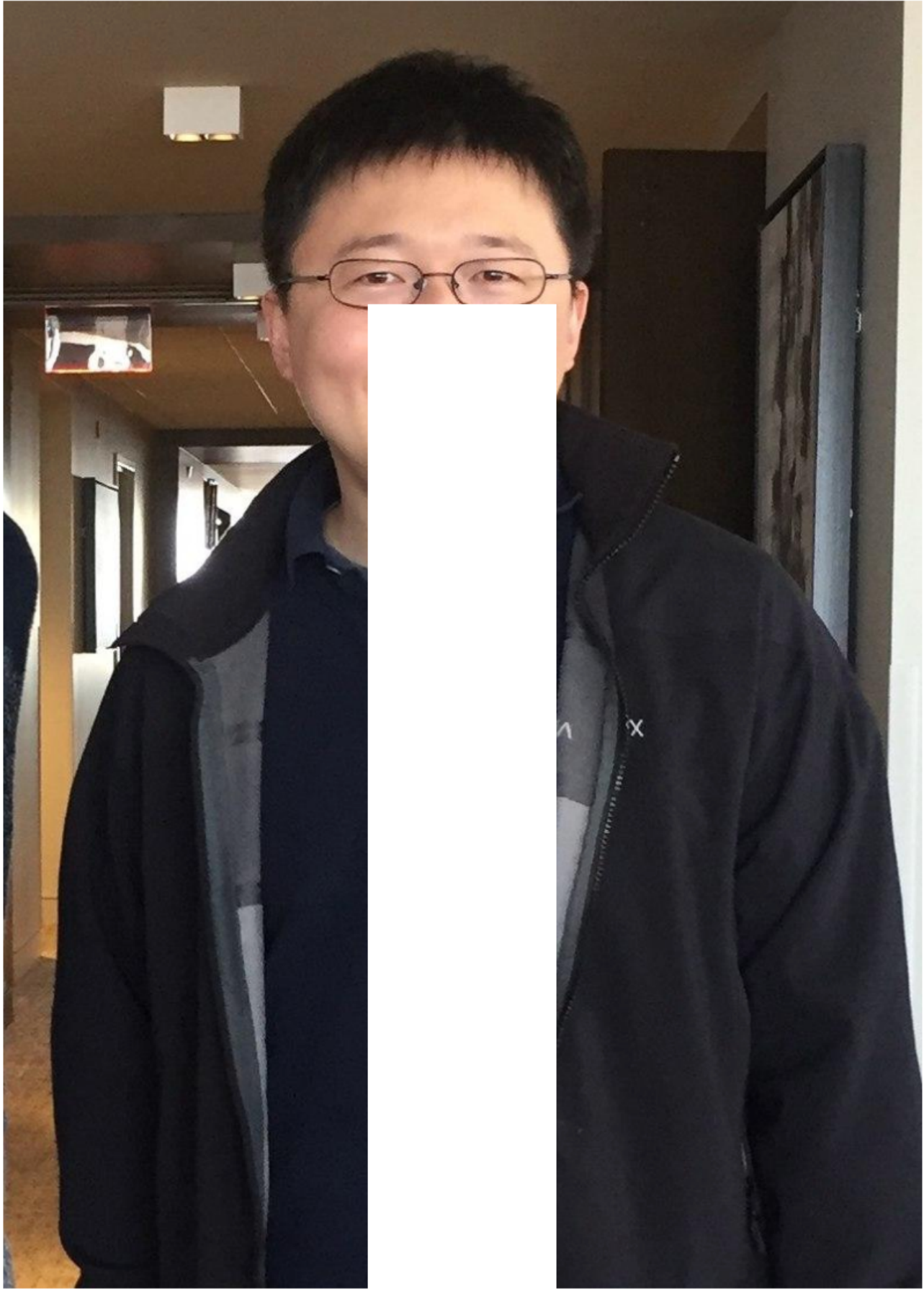












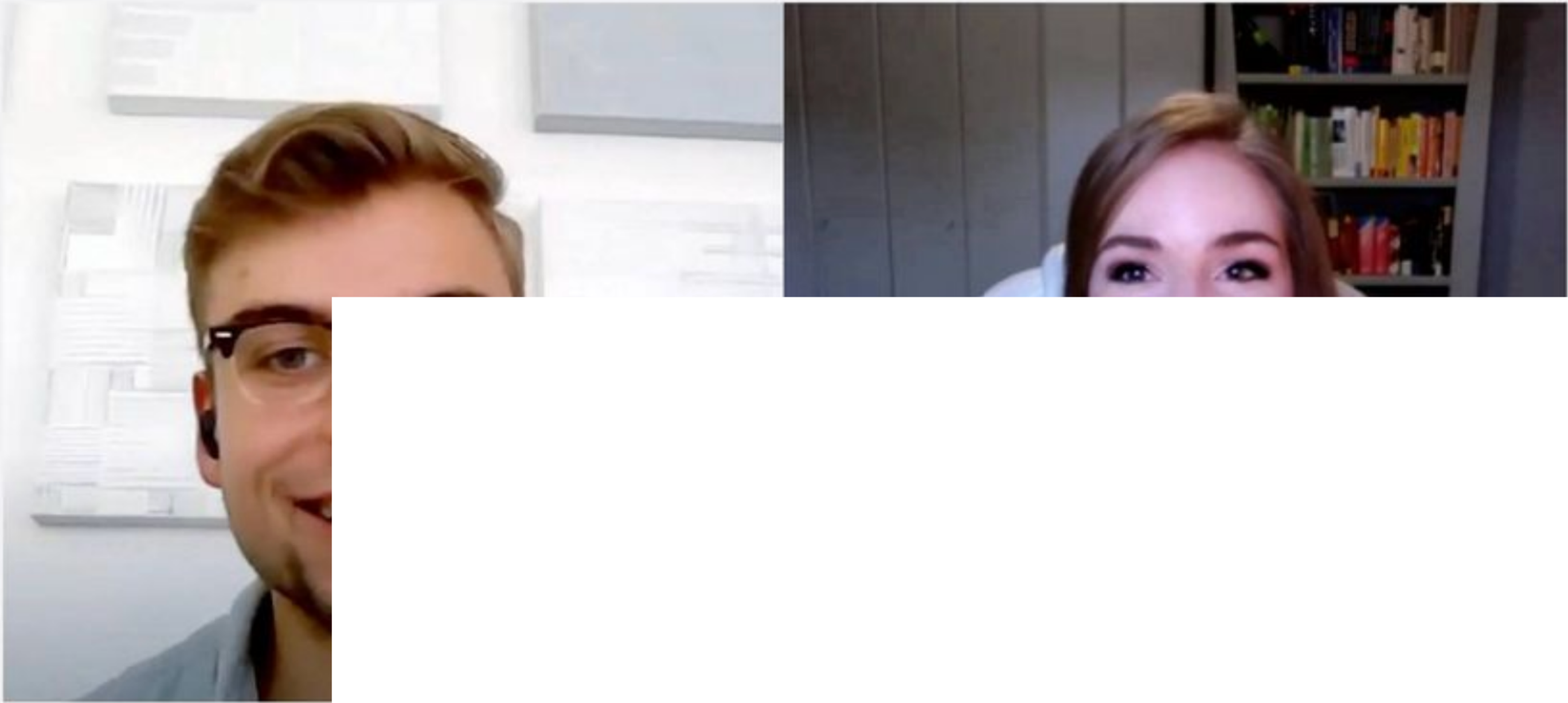


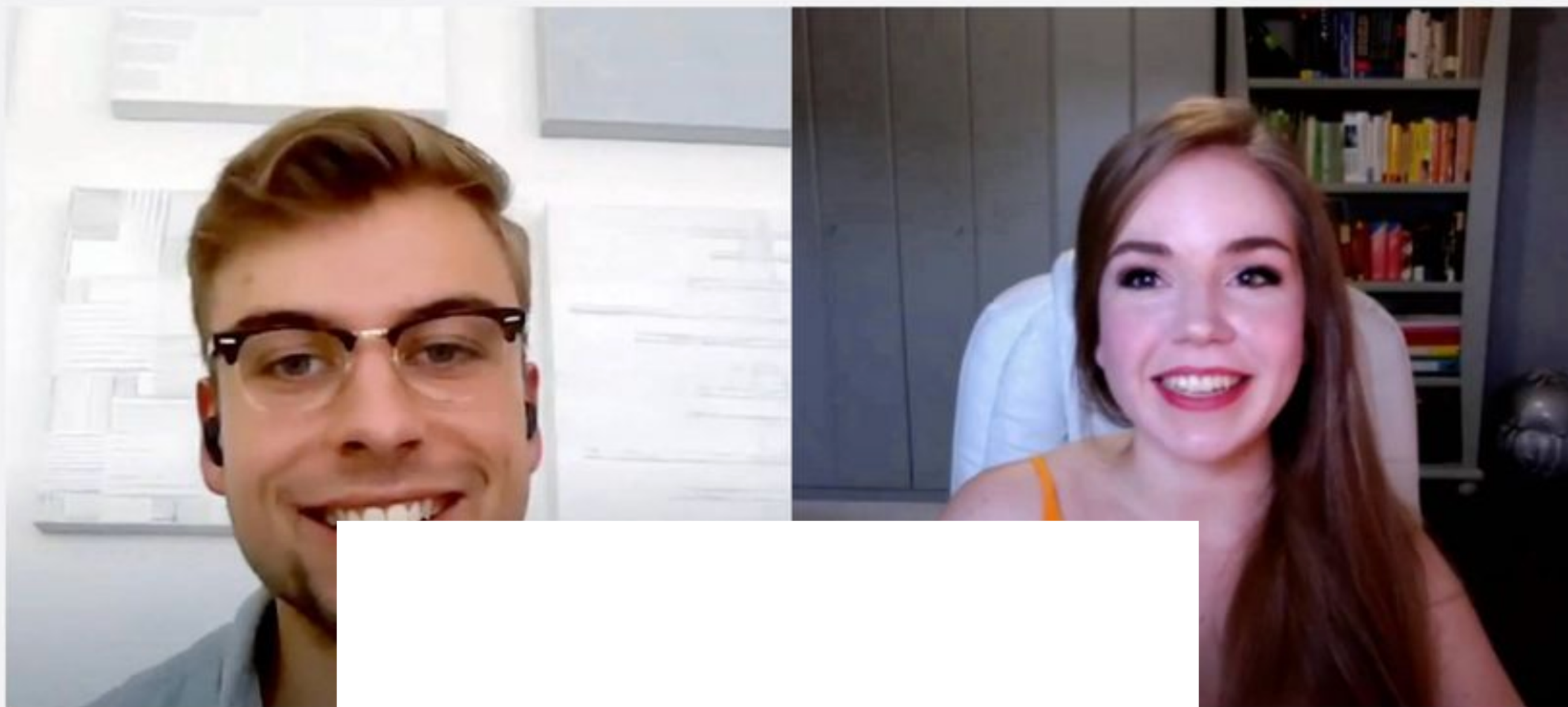


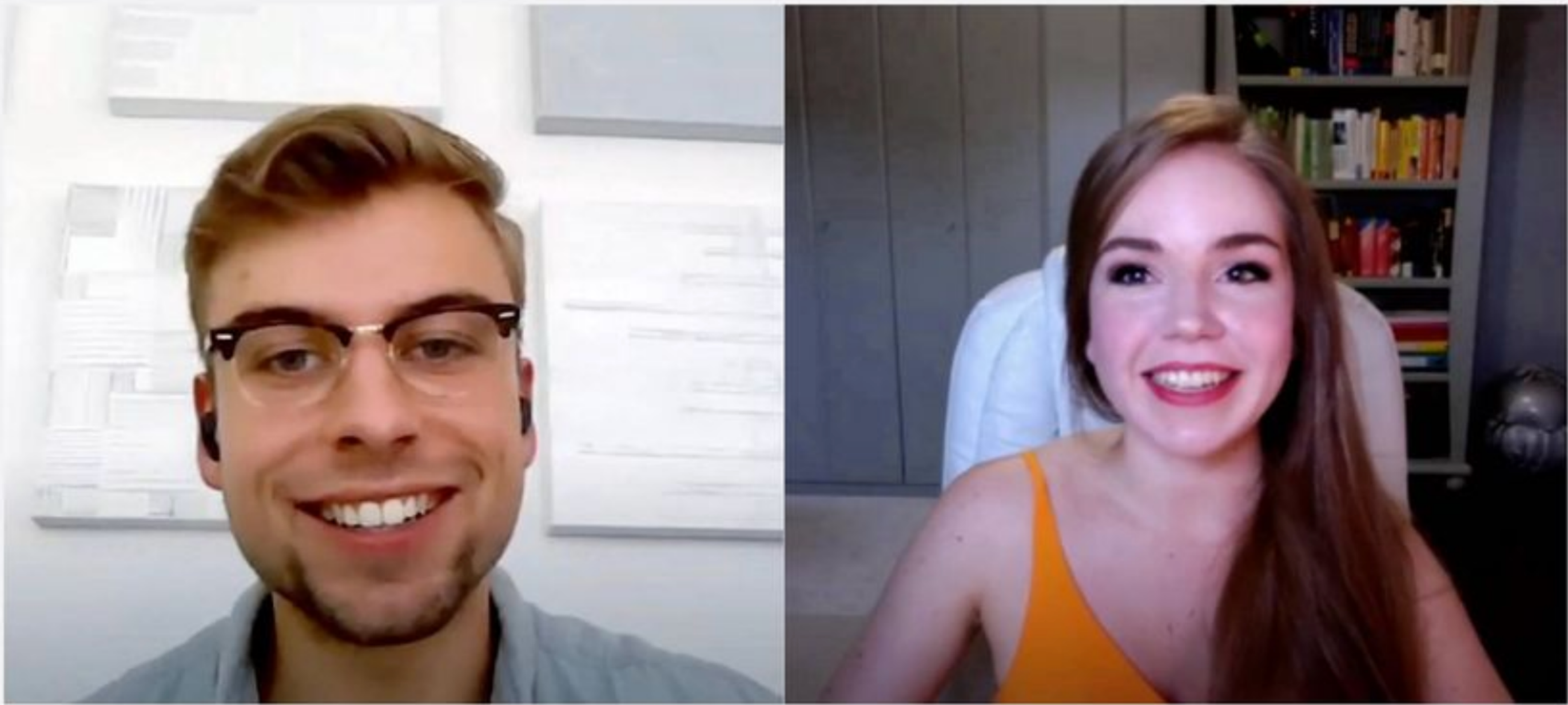
Feng
Zhang













Erik
Hartman



Blanka
Novák



Gene-editing Technologies

- change an organism's DNA - manipulation

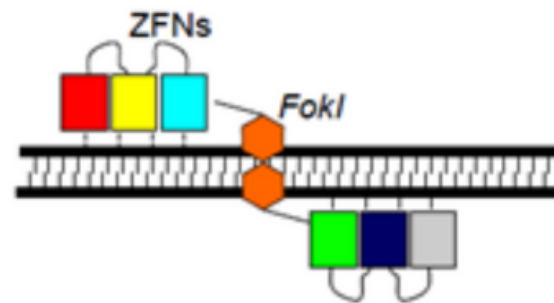


DOUBLE
HELIX

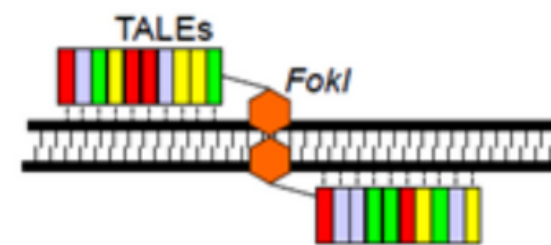
Gene-editing Technologies

- different techniques

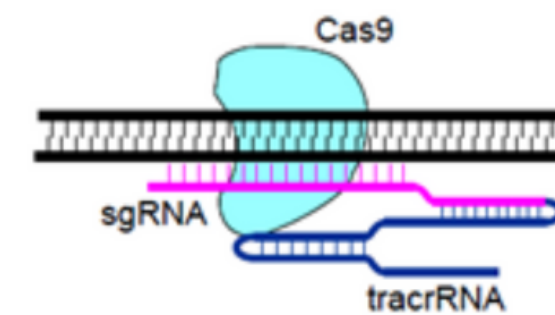
A



B

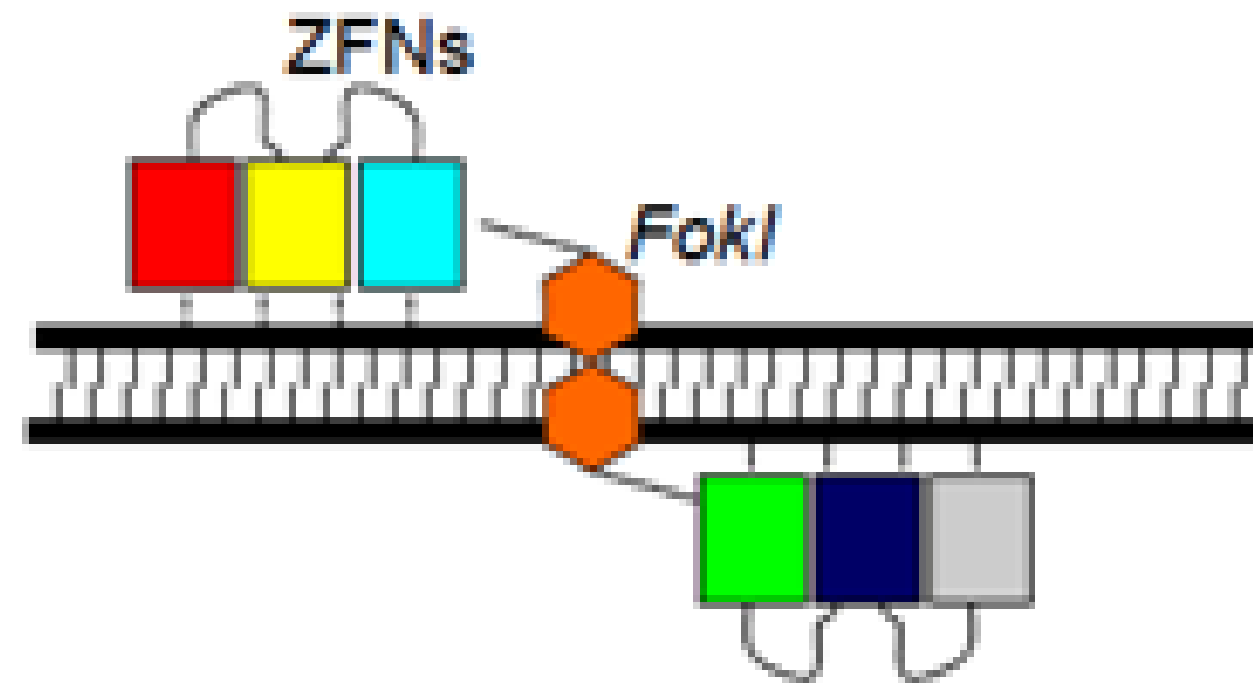


C



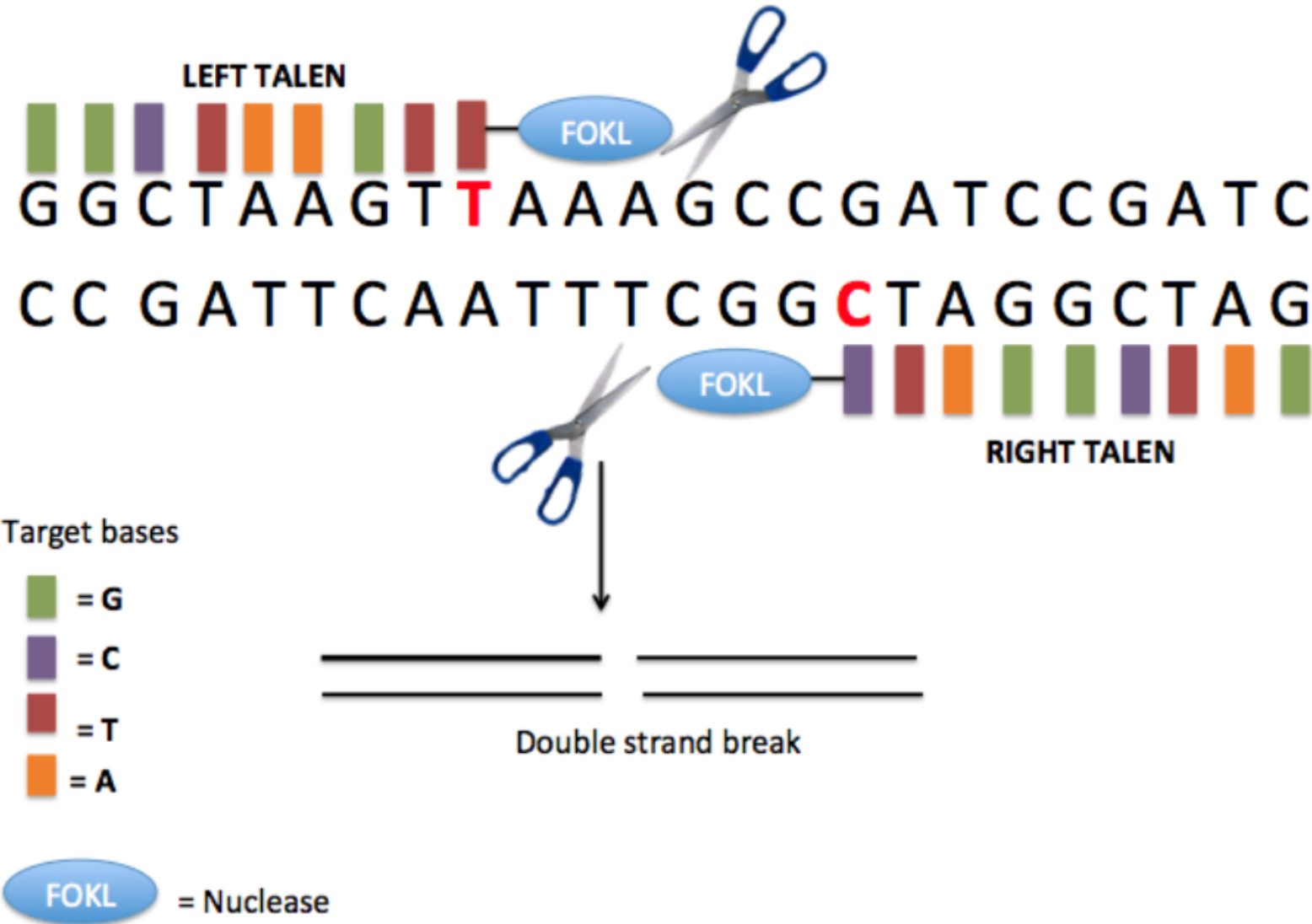
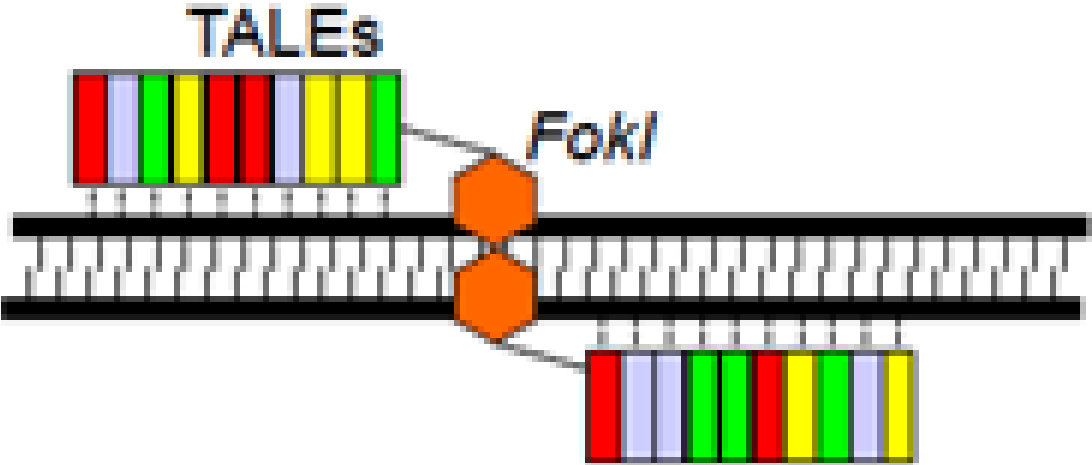
Zinc Finger Nucleases (ZFNs)

- engineered DNA-binding proteins



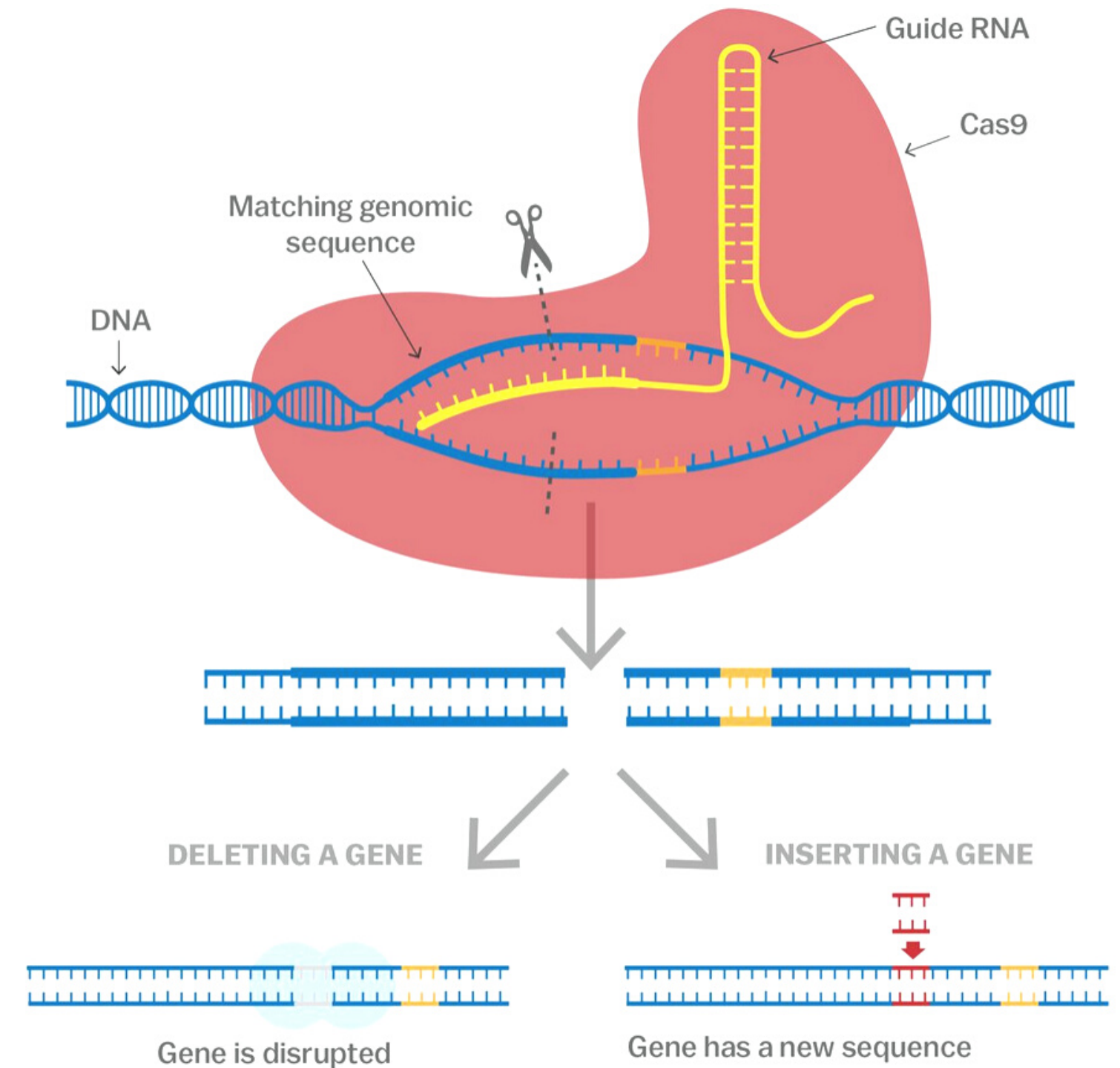
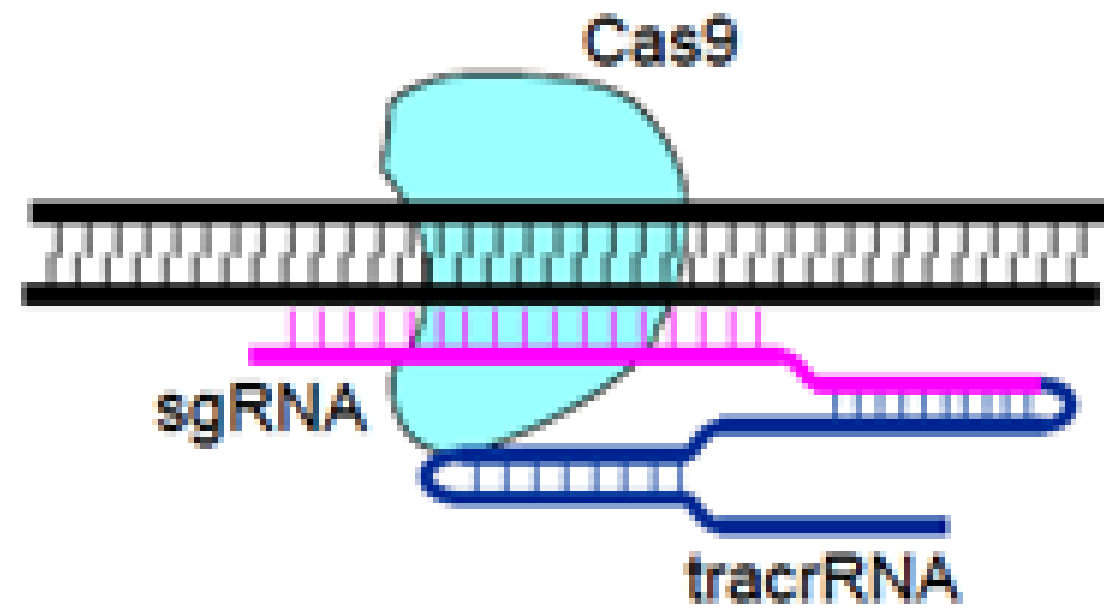
TALENs

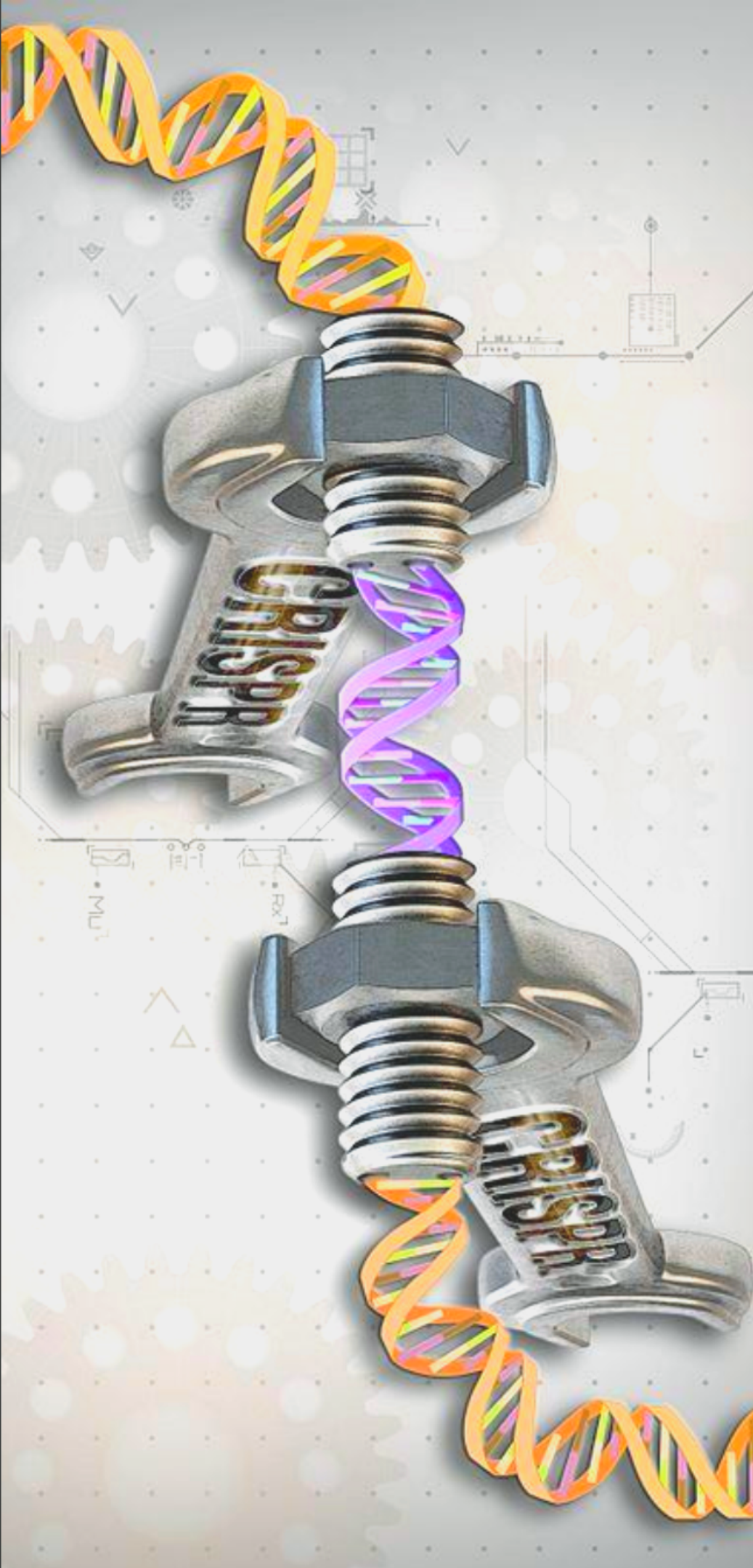
- Transcription Activator-Like Effector Nuclease



CRISPR

- Clustered Regularly Interspaced Short Palindromic Repeats



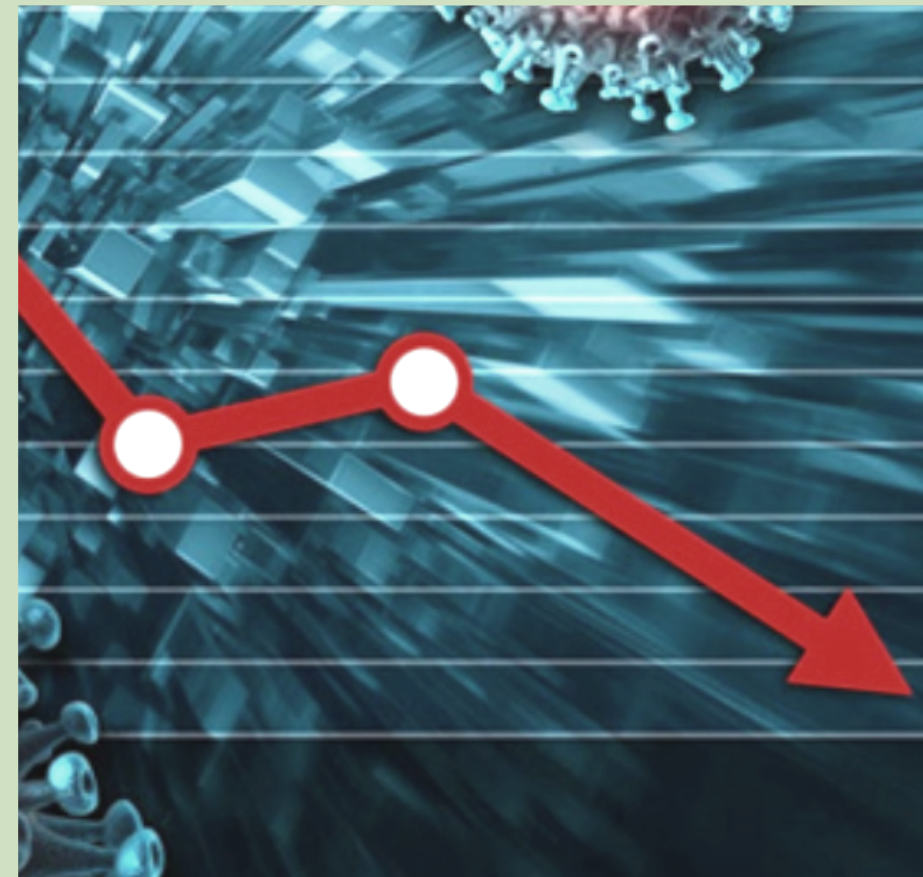


CRISPR technology and its contribution in the fight against COVID-19

COVID-19 Impact



HEALTH



ECONOMY



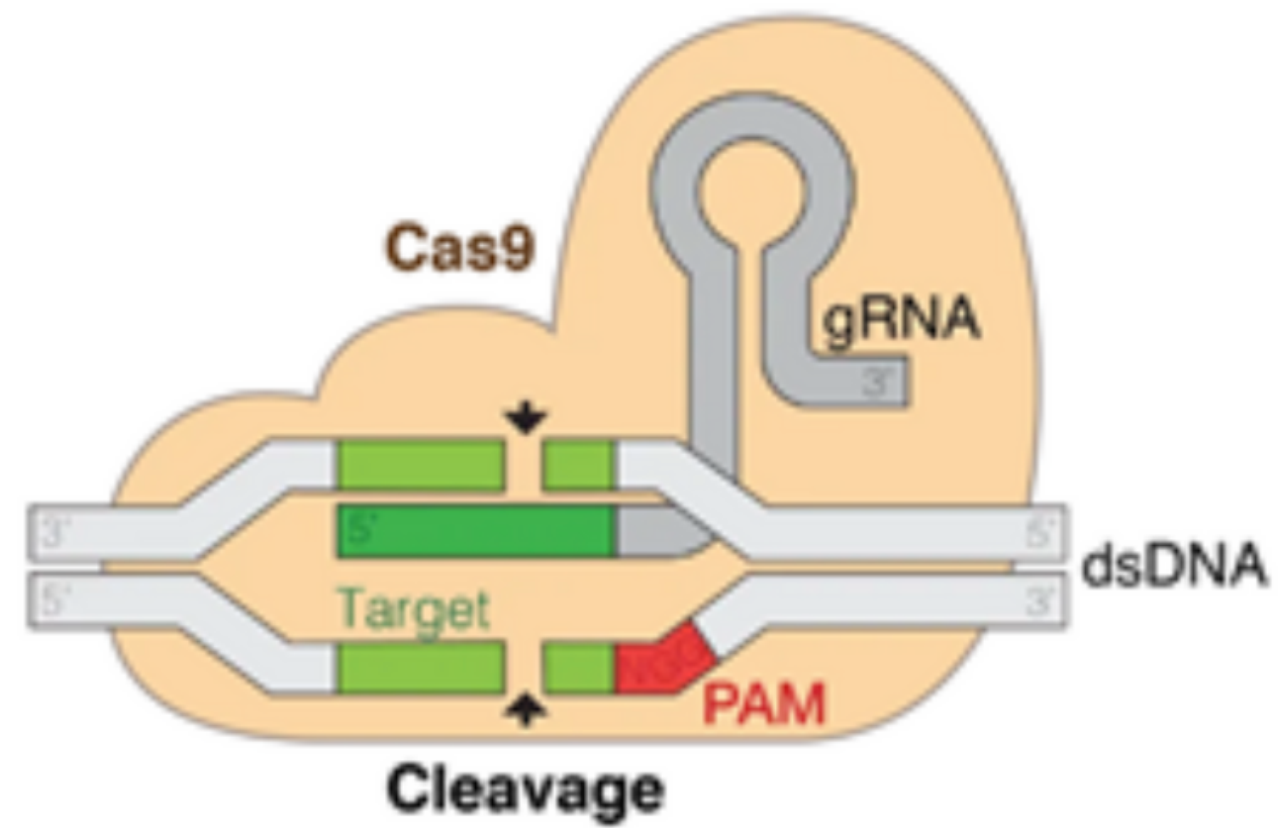
EDUCATION

What is CRISPR?



CRISPR

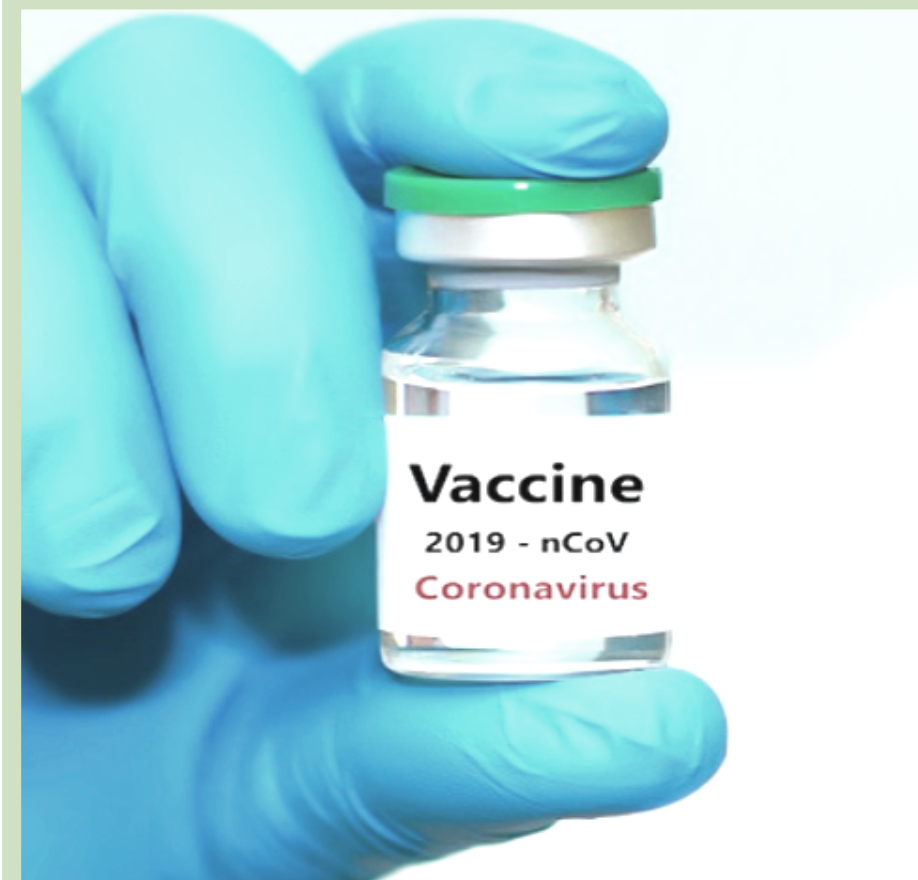
- Clustered Regularly Interspaced Short Palindromic Repeats



CRISPR against COVID-19



DIAGNOSTIC



VACCINE



Ethical Considerations



True or False

THERE ARE ALREADY GENE-EDITED
BABIES ON EARTH.



True or False

THERE ARE ALREADY GENE-EDITED
BABIES ON EARTH.





Synthetic biology has a lot of promising advantages in terms of curing diseases, developing vaccines and even solving today's global pandemic. However, it can also be disadvantageous especially when it falls in the hands of those who have wrong motives and who have no sense of, or care for, what is right or wrong.



Recap



PLAYING GOD



ORGANISMS VS.
MACHINES



MISUSE OF
KNOWLEDGE

Gene-edited babies using CRISPR



Global moratorium





Ethics v.s. Values

Two things to remember

1

THE VALUES IN CAMPUS BECOMES THE VALUES IN SOCIETY.

2

THE FUTURE LEADERS OF SCIENCE ARE IN THE CAMPUS.

Assignment

Thank you!



Sources

<https://unsplash.com/photos/nXt5HtLmlgE2><https://search.creativecommons.org/photos/e0bbd054-bd91-4f7e-95e3-2e1028389f353>.
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<https://www.expresspharma.in/latest-updates/prep-for-covid-19-vaccine-distribution-as-soon-as-late-october-us-cdc/>