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David R. Liu: Can we cure genetic diseases by rewriting DNA? | TED Talk

https://www.ted.com/talks/david_r_liu_can_we_cure_genetic_diseases_by_rewriting_dna

Advanced Words Only

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Session 1: Word List

unhealthy

adj. not conducive to good health; detrimental to physical or mental well-being

synonym: unwholesome, detrimental, insalubrious

(1) **unhealthy** diet, (2) **unhealthy** habit

Sitting for long hours in front of the computer is considered **unhealthy**.

disrupt

v. to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance

synonym: interrupt, disturb, break into

(1) **disrupt** a well-ordered condition, (2) **disrupt** sleep

I'm so sorry to **disrupt** you when you're pretty busy.

misbehave

v. to behave badly

synonym: act up, fool around, trespass

(1) **misbehave** with language, (2) the student who had **misbehaved**

It was unbelievable that they should **misbehave**.

inherit

v. to receive money, property, or a title from someone after they have died

synonym: obtain, gain, acquire

(1) **inherit** estate, (2) **inherit** ancestral property
After his death, his sons **inherited** his business.

sickle

n. a tool consisting of a short curved blade with a handle, used for cutting grass or grain; also a symbol associated with harvest or death

synonym: scythe, crescent, cutter

(1) **sickle-shaped** moon, (2) harvest **sickle**

The blade of the **sickle** glinted in the sunlight as he swung it back and forth.

anemia

n. a medical condition in which the body lacks enough red blood cells or hemoglobin, causing fatigue, weakness, or difficulty breathing; a lack of vitality or liveliness in something

synonym: bloodlessness, pallor, weakness

(1) **anemia** symptoms, (2) **anemia** disease

The doctor diagnosed the patient with **anemia** due to a lack of iron in their blood.

progeria

n. a rare genetic disorder that occurs in children and causes rapid aging and premature death, which is characterized by the appearance of aging-related symptoms, such as wrinkles and stiff joints, and typically leads to death in the teenage years

synonym: rapid aging disease, premature aging

(1) **progeria** syndrome, (2) **progeria** genetics

Children with **progeria** often have a small body size and are prone to heart problems.

dystrophy

n. a group of inherited disorders that involve the progressive weakening and wasting of muscles or tissues, often leading to disability or organ failure; commonly characterized by muscle weakness, atrophy, and degeneration

synonym: degeneration, weakening, wasting

(1) **dystrophy** treatment, (2) **dystrophy** of cervical cartilage

Muscular **dystrophy** is a genetic disease that causes weakness and degeneration of muscles over time.

grievous

adj. causing great suffering, pain, or sorrow; serious, grave, or dire

synonym: atrocious, severe, painful

(1) **grievous** condition, (2) **grievous** mistake

The **grievous** injury he sustained in the car accident left him unable to walk.

hemoglobin

n. a protein-based molecule found in red blood cells that transports oxygen throughout the body

synonym: red cell pigment, oxygen carrier

(1) **hemoglobin** level, (2) abnormal **hemoglobin**

The **hemoglobin** gene mutation can cause genetic disorders such as sickle cell disease.

medicinal

adj. of or relating to the treatment or cure of disease

synonym: curative, therapeutic, healing

(1) **medicinal** chemistry, (2) traditional **medicinal**

The **medicinal** properties of this herb have been known to help with various ailments.

infect

v. to affect a person, an animal, or a plant with a disease-causing organism

synonym: pollute, contaminate, affect

(1) **infect** other animal species, (2) **infect** a computer with a virus

Children often **infect** parents with this head cold.

warhead

n. the explosive or destructive part of a missile, rocket, or other weapons that are designed to explode on impact or detonation

synonym: payload, explosive

(1) **warhead** missile, (2) nuclear **warhead**

The missile launch was successful, and the **warhead** hit its

intended target.

helix

n. a three-dimensional spiral shape or structure, particularly like that of a spring or a DNA molecule

synonym: coil, spiral, twist

(1) **helix** structure, (2) alpha **helix**

The DNA molecule is shaped like a double **helix**.

snippet

n. a small piece or brief extract of something

synonym: fragment, excerpt, brief

(1) **snippet** of wisdom, (2) code **snippet**

The journalist saved a **snippet** of the interview for later reference.

predominate

v. to be the most powerful, important, or frequent; to be more common or prevalent than others

synonym: reign, prevail, rule

(1) **predominate** in the army, (2) **predominate** religion

In this particular field, his work **predominated** over all others.

rearrange

v. to change the order or position of things already made; to change the time, date, or place of an event already planned

synonym: readjust, reorganize, reconstruct

(1) **rearrange** the furniture, (2) **rearrange** his schedule

Please **rearrange** these files as we start a new project tomorrow.

mismatch

v. to put together or match items that are not compatible or do not fit well together; to be different from or not correspond to something else

synonym: mismatch, discord, clash

(1) **mismatch** expectations, (2) **mismatch** socks

The colors of the shirt and pants totally **mismatch**, making the outfit look ridiculous.

remake

- v.* to create a new version of a work of art, such as a film, song, or play, using the same or similar material as the original; to adapt or update something for a new audience or purpose; (noun) a new version or adaptation of a previously existing movie, song, TV show, or other creative work

synonym : revamp, redo, reproduce

(1) video game **remake**, (2) **remake** song

The director plans to **remake** the classic movie with a modern twist.

pathogen

- n.* a bacterium, virus, or other microorganism that causes disease

synonym : germ, microbe, bacterium

(1) plant **pathogen**, (2) the **pathogen** in the air

mRNA vaccines are approved faster because they do not contain inactivated **pathogens**.

stumble

- v.* to miss a step and fall or nearly fall; to walk unsteadily

synonym : bumble, struggle, misstep

(1) **stumble** financially, (2) **stumble** through life

She **stumbled** over the tree root.

applause

- n.* a demonstration of approval or praise by clapping the hands together

synonym : clapping, cheering, acclaim

(1) round of **applause**, (2) earn **applause**

The **applause** burst from the audience.

biomedical

- adj.* relating to the application of the natural sciences, especially biology, and physiology, to clinical medicine and healthcare

synonym : medical, clinical, health-related

(1) **biomedical** assay, (2) cutting-edge **biomedical**

Biomedical engineering focuses on developing new medical technologies and innovations to improve patient health outcomes.

primate

n. any mammal of the order Primates, which includes monkeys, apes, and humans

synonym : ape, monkey, lemur

(1) **primate** species, (2) **primate** sanctuary

Many scientists study **primate** behavior and intelligence.

tyrosine

n. an amino acid that is essential for the synthesis of proteins in the body that is referred to as a non-essential amino acid because the body can produce it, although it is also present in some foods

(1) **tyrosine** kinase, (2) **tyrosine** metabolism

Foods rich in **tyrosine** include cheese, nuts, and meat.

thalassemia

n. a group of inherited blood disorders characterized by inadequate or abnormal synthesis of hemoglobin, the protein in red blood cells that carries oxygen; resulting in anemia, fatigue, and other symptoms

synonym : anemia, blood disorder, blood disease

(1) **thalassemia** minor, (2) Alpha **thalassemia**

Thalassemia major is a severe form of anemia requiring regular blood transfusions.

phenylketonuria

n. a genetic disorder that causes a build-up of phenylalanine (= an essential amino acid) in the body and can lead to intellectual disability, behavioral problems, seizures, and other physical and mental health issues

synonym : PKU, folling's disease

(1) **phenylketonuria** test, (2) **phenylketonuria** diet

Newborns with **phenylketonuria** must follow a strict diet to prevent any negative effects on their health.

congenital

adj. existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth

synonym : innate, inborn, inherent

(1) **congenital** disease, (2) **congenital** disorder

Congenital heart defects can often be diagnosed before a

baby is born.

cofounder

n. one of several people who establishes an organization or starts a business

(1) **cofounder** of the university, (2) late **cofounder**

He is the **cofounder** and chairman of this tech company.

timescale

n. a period or interval of time, particularly one used as a standard for measuring or comparing other periods of time; a reference point or benchmark for the duration or length of a particular event or process

synonym: time frame, schedule, duration

(1) long- **timescale**, (2) realistic **timescale**

The **timescale** for completing the construction project is three years.

relentless

adj. persistent and determined; continuing despite difficulties or setbacks

synonym: unyielding, tireless, unremitting

(1) **relentless** attack, (2) face **relentless** pressure

The athlete's **relentless** training paid off in the end.

dedicate

v. to give all of your energy, time, etc., entirely to a specific person, activity, or cause; to set apart for a particular purpose or use

synonym: consecrate, devote, commit

(1) **dedicate** a few hours, (2) **dedicate** a chapter to the subject

He **dedicated** his life to helping others.

aspiration

n. a strong desire to achieve something; the action or process of drawing breath

synonym: ambition, inhalation, intake

(1) no **aspiration** for fame, (2) **aspiration** into the lungs

He has an **aspiration** to become a doctor.

Session 2: Spelling

1. con_____al disorder
adj. existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth
2. he__x structure
n. a three-dimensional spiral shape or structure, particularly like that of a spring or a DNA molecule
3. pr_____ia syndrome
n. a rare genetic disorder that occurs in children and causes rapid aging and premature death, which is characterized by the appearance of aging-related symptoms, such as wrinkles and stiff joints, and typically leads to death in the teenage years
4. traditional me_____al
adj. of or relating to the treatment or cure of disease
5. harvest si___e
n. a tool consisting of a short curved blade with a handle, used for cutting grass or grain; also a symbol associated with harvest or death
6. pre_____te religion
v. to be the most powerful, important, or frequent; to be more common or prevalent than others
7. code sn_____t
n. a small piece or brief extract of something
8. re_____ge his schedule
v. to change the order or position of things already made; to change the time, date, or place of an event already planned

ANSWERS: 1. congenital, 2. helix, 3. progeria, 4. medicinal, 5. sickle, 6. predominate, 7. snippet, 8. rearrange

9. nuclear wa_____d *n.* the explosive or destructive part of a missile, rocket, or other weapons that are designed to explode on impact or detonation
10. un_____hy diet *adj.* not conducive to good health; detrimental to physical or mental well-being
11. de_____te a chapter to the subject *v.* to give all of your energy, time, etc., entirely to a specific person, activity, or cause; to set apart for a particular purpose or use
12. pre_____te in the army *v.* to be the most powerful, important, or frequent; to be more common or prevalent than others
13. mi_____ch expectations *v.* to put together or match items that are not compatible or do not fit well together; to be different from or not correspond to something else
14. gr_____us condition *adj.* causing great suffering, pain, or sorrow; serious, grave, or dire
15. in_____t estate *v.* to receive money, property, or a title from someone after they have died
16. bio_____al assay *adj.* relating to the application of the natural sciences, especially biology, and physiology, to clinical medicine and healthcare
17. the pa_____en in the air *n.* a bacterium, virus, or other microorganism that causes disease
18. round of ap_____se *n.* a demonstration of approval or praise by clapping the hands together

ANSWERS: 9. warhead, 10. unhealthy, 11. dedicate, 12. predominate, 13. mismatch, 14. grievous, 15. inherit, 16. biomedical, 17. pathogen, 18. applause

19. ty_____ne metabolism *n.* an amino acid that is essential for the synthesis of proteins in the body that is referred to as a non-essential amino acid because the body can produce it, although it is also present in some foods
20. mi_____ch socks *v.* to put together or match items that are not compatible or do not fit well together; to be different from or not correspond to something else
21. de_____te a few hours *v.* to give all of your energy, time, etc., entirely to a specific person, activity, or cause; to set apart for a particular purpose or use
22. ty_____ne kinase *n.* an amino acid that is essential for the synthesis of proteins in the body that is referred to as a non-essential amino acid because the body can produce it, although it is also present in some foods
23. earn ap_____se *n.* a demonstration of approval or praise by clapping the hands together
24. face rel_____ss pressure *adj.* persistent and determined; continuing despite difficulties or setbacks
25. rel_____ss attack *adj.* persistent and determined; continuing despite difficulties or setbacks
26. si___e-shaped moon *n.* a tool consisting of a short curved blade with a handle, used for cutting grass or grain; also a symbol associated with harvest or death

ANSWERS: 19. tyrosine, 20. mismatch, 21. dedicate, 22. tyrosine, 23. applause, 24. relentless, 25. relentless, 26. sickle

27. long-ti_____le *n.* a period or interval of time, particularly one used as a standard for measuring or comparing other periods of time; a reference point or benchmark for the duration or length of a particular event or process
28. an___a symptoms *n.* a medical condition in which the body lacks enough red blood cells or hemoglobin, causing fatigue, weakness, or difficulty breathing; a lack of vitality or liveliness in something
29. re_____ge the furniture *v.* to change the order or position of things already made; to change the time, date, or place of an event already planned
30. st_____e financially *v.* to miss a step and fall or nearly fall; to walk unsteadily
31. in___t a computer with a virus *v.* to affect a person, an animal, or a plant with a disease-causing organism
32. con_____al disease *adj.* existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth
33. no asp_____on for fame *n.* a strong desire to achieve something; the action or process of drawing breath
34. wa_____d missile *n.* the explosive or destructive part of a missile, rocket, or other weapons that are designed to explode on impact or detonation
35. the student who had mi_____ved *v.* to behave badly

ANSWERS: 27. timescale, 28. anemia, 29. rearrange, 30. stumble, 31. infect, 32. congenital, 33. aspiration, 34. warhead, 35. misbehave

36. pr_____e species *n.* any mammal of the order Primates, which includes monkeys, apes, and humans
37. dy_____hy treatment *n.* a group of inherited disorders that involve the progressive weakening and wasting of muscles or tissues, often leading to disability or organ failure; commonly characterized by muscle weakness, atrophy, and degeneration
38. phe_____ria test *n.* a genetic disorder that causes a build-up of phenylalanine (= an essential amino acid) in the body and can lead to intellectual disability, behavioral problems, seizures, and other physical and mental health issues
39. realistic ti_____le *n.* a period or interval of time, particularly one used as a standard for measuring or comparing other periods of time; a reference point or benchmark for the duration or length of a particular event or process
40. in___t other animal species *v.* to affect a person, an animal, or a plant with a disease-causing organism
41. alpha he__x *n.* a three-dimensional spiral shape or structure, particularly like that of a spring or a DNA molecule
42. st_____e through life *v.* to miss a step and fall or nearly fall; to walk unsteadily
43. un_____hy habit *adj.* not conducive to good health; detrimental to physical or mental well-being

ANSWERS: 36. primate, 37. dystrophy, 38. phenylketonuria, 39. timescale, 40. infect, 41. helix, 42. stumble, 43. unhealthy

44. dy_____hy of cervical cartilage *n.* a group of inherited disorders that involve the progressive weakening and wasting of muscles or tissues, often leading to disability or organ failure; commonly characterized by muscle weakness, atrophy, and degeneration
45. asp_____on into the lungs *n.* a strong desire to achieve something; the action or process of drawing breath
46. an___a disease *n.* a medical condition in which the body lacks enough red blood cells or hemoglobin, causing fatigue, weakness, or difficulty breathing; a lack of vitality or liveliness in something
47. di_____t a well-ordered condition *v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance
48. tha_____ia minor *n.* a group of inherited blood disorders characterized by inadequate or abnormal synthesis of hemoglobin, the protein in red blood cells that carries oxygen; resulting in anemia, fatigue, and other symptoms
49. plant pa_____en *n.* a bacterium, virus, or other microorganism that causes disease
50. abnormal hem_____in *n.* a protein-based molecule found in red blood cells that transports oxygen throughout the body
51. gr_____us mistake *adj.* causing great suffering, pain, or sorrow; serious, grave, or dire

ANSWERS: 44. dystrophy, 45. aspiration, 46. anemia, 47. disrupt, 48. thalassemia, 49. pathogen, 50. hemoglobin, 51. grievous

52. sn_____t of wisdom *n.* a small piece or brief extract of something
53. in_____t ancestral property *v.* to receive money, property, or a title from someone after they have died
54. Alpha tha_____ia *n.* a group of inherited blood disorders characterized by inadequate or abnormal synthesis of hemoglobin, the protein in red blood cells that carries oxygen; resulting in anemia, fatigue, and other symptoms
55. re____e song *v.* to create a new version of a work of art, such as a film, song, or play, using the same or similar material as the original; to adapt or update something for a new audience or purpose; (noun) a new version or adaptation of a previously existing movie, song, TV show, or other creative work
56. pr_____e sanctuary *n.* any mammal of the order Primates, which includes monkeys, apes, and humans
57. hem_____in level *n.* a protein-based molecule found in red blood cells that transports oxygen throughout the body
58. me_____al chemistry *adj.* of or relating to the treatment or cure of disease
59. di_____t sleep *v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance

ANSWERS: 52. snippet, 53. inherit, 54. thalassemia, 55. remake, 56. primate, 57. hemoglobin, 58. medicinal, 59. disrupt

60. co_____er of the university *n.* one of several people who establishes an organization or starts a business
61. cutting-edge bio_____al *adj.* relating to the application of the natural sciences, especially biology, and physiology, to clinical medicine and healthcare
62. late co_____er *n.* one of several people who establishes an organization or starts a business
63. pr_____ia genetics *n.* a rare genetic disorder that occurs in children and causes rapid aging and premature death, which is characterized by the appearance of aging-related symptoms, such as wrinkles and stiff joints, and typically leads to death in the teenage years
64. mi_____ve with language *v.* to behave badly
65. phe_____ria diet *n.* a genetic disorder that causes a build-up of phenylalanine (= an essential amino acid) in the body and can lead to intellectual disability, behavioral problems, seizures, and other physical and mental health issues
66. video game re___e *v.* to create a new version of a work of art, such as a film, song, or play, using the same or similar material as the original; to adapt or update something for a new audience or purpose; (noun) a new version or adaptation of a previously existing movie, song, TV show, or other creative work

ANSWERS: 60. cofounder, 61. biomedical, 62. cofounder, 63. progeria, 64. misbehave, 65. phenylketonuria, 66. remake

ANSWERS:

Session 3: Fill in the Blanks

1. The _____ properties of this herb have been known to help with various ailments.
adj. of or relating to the treatment or cure of disease

2. Newborns with _____ must follow a strict diet to prevent any negative effects on their health.
n. a genetic disorder that causes a build-up of phenylalanine (= an essential amino acid) in the body and can lead to intellectual disability, behavioral problems, seizures, and other physical and mental health issues

3. mRNA vaccines are approved faster because they do not contain inactivated _____.
n. a bacterium, virus, or other microorganism that causes disease

4. Please _____ these files as we start a new project tomorrow.
v. to change the order or position of things already made; to change the time, date, or place of an event already planned

5. _____ heart defects can often be diagnosed before a baby is born.
adj. existing from birth; often used to describe a condition or trait that is inherited or present from the moment of birth

6. In this particular field, his work _____ over all others.
v. to be the most powerful, important, or frequent; to be more common or prevalent than others

7. The DNA molecule is shaped like a double _____.
n. a three-dimensional spiral shape or structure, particularly like that of a spring or a DNA molecule

ANSWERS: 1. medicinal, 2. phenylketonuria, 3. pathogens, 4. rearrange, 5. Congenital, 6. predominated, 7. helix

8. The director plans to _____ the classic movie with a modern twist.
- v.* to create a new version of a work of art, such as a film, song, or play, using the same or similar material as the original; to adapt or update something for a new audience or purpose; (noun) a new version or adaptation of a previously existing movie, song, TV show, or other creative work
9. _____ engineering focuses on developing new medical technologies and innovations to improve patient health outcomes.
- adj.* relating to the application of the natural sciences, especially biology, and physiology, to clinical medicine and healthcare
10. He is the _____ and chairman of this tech company.
- n.* one of several people who establishes an organization or starts a business
11. She _____ over the tree root.
- v.* to miss a step and fall or nearly fall; to walk unsteadily
12. Sitting for long hours in front of the computer is considered _____.
- adj.* not conducive to good health; detrimental to physical or mental well-being
13. I'm so sorry to _____ you when you're pretty busy.
- v.* to prevent or stop something, especially an event, activity, or process, from continuing in the usual way by causing a problem or disturbance
14. The _____ gene mutation can cause genetic disorders such as sickle cell disease.
- n.* a protein-based molecule found in red blood cells that transports oxygen throughout the body
15. Muscular _____ is a genetic disease that causes weakness and degeneration of muscles over time.
- n.* a group of inherited disorders that involve the progressive weakening and wasting of muscles or tissues, often leading to disability or organ failure; commonly characterized by muscle weakness, atrophy, and degeneration

ANSWERS: 8. remake, 9. Biomedical, 10. cofounder, 11. stumbled, 12. unhealthy,

13. disrupt, 14. hemoglobin, 15. dystrophy

16. Many scientists study _____ behavior and intelligence.
- n.* any mammal of the order Primates, which includes monkeys, apes, and humans
17. It was unbelievable that they should _____.
- v.* to behave badly
18. The missile launch was successful, and the _____ hit its intended target.
- n.* the explosive or destructive part of a missile, rocket, or other weapons that are designed to explode on impact or detonation
19. _____ major is a severe form of anemia requiring regular blood transfusions.
- n.* a group of inherited blood disorders characterized by inadequate or abnormal synthesis of hemoglobin, the protein in red blood cells that carries oxygen; resulting in anemia, fatigue, and other symptoms
20. Children often _____ parents with this head cold.
- v.* to affect a person, an animal, or a plant with a disease-causing organism
21. He has an _____ to become a doctor.
- n.* a strong desire to achieve something; the action or process of drawing breath
22. The _____ burst from the audience.
- n.* a demonstration of approval or praise by clapping the hands together
23. Foods rich in _____ include cheese, nuts, and meat.
- n.* an amino acid that is essential for the synthesis of proteins in the body that is referred to as a non-essential amino acid because the body can produce it, although it is also present in some foods

ANSWERS: 16. primate, 17. misbehave, 18. warhead, 19. Thalassemia, 20. infect, 21. aspiration, 22. applause, 23. tyrosine

24. The doctor diagnosed the patient with _____ due to a lack of iron in their blood.
n. a medical condition in which the body lacks enough red blood cells or hemoglobin, causing fatigue, weakness, or difficulty breathing; a lack of vitality or liveliness in something
25. The journalist saved a _____ of the interview for later reference.
n. a small piece or brief extract of something
26. After his death, his sons _____ his business.
v. to receive money, property, or a title from someone after they have died
27. The _____ injury he sustained in the car accident left him unable to walk.
adj. causing great suffering, pain, or sorrow; serious, grave, or dire
28. The colors of the shirt and pants totally _____ making the outfit look ridiculous.
v. to put together or match items that are not compatible or do not fit well together; to be different from or not correspond to something else
29. Children with _____ often have a small body size and are prone to heart problems.
n. a rare genetic disorder that occurs in children and causes rapid aging and premature death, which is characterized by the appearance of aging-related symptoms, such as wrinkles and stiff joints, and typically leads to death in the teenage years
30. The athlete's _____ training paid off in the end.
adj. persistent and determined; continuing despite difficulties or setbacks
31. The blade of the _____ glinted in the sunlight as he swung it back and forth.
n. a tool consisting of a short curved blade with a handle, used for cutting grass or grain; also a symbol associated with harvest or death

ANSWERS: 24. anemia, 25. snippet, 26. inherited, 27. grievous, 28. mismatch, 29. progeria, 30. relentless, 31. sickle

32. The _____ for completing the construction project is three years.

- n.* a period or interval of time, particularly one used as a standard for measuring or comparing other periods of time; a reference point or benchmark for the duration or length of a particular event or process

33. He _____ his life to helping others.

- v.* to give all of your energy, time, etc., entirely to a specific person, activity, or cause; to set apart for a particular purpose or use

ANSWERS: 32. timescale, 33. dedicated