
Scientists Create Chemotherapy Treatment with Reduced Toxicity and Improved Efficacy

Description

Researchers at the Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine), have developed a groundbreaking cancer treatment method that offers a more precise, potent, and less harmful alternative to traditional chemotherapy. Led by Associate Professor Matthew Chang, the team at NUS Medicine has engineered bacteria to deliver chemotherapy in a targeted manner, significantly enhancing treatment efficacy and reducing side effects.

The new treatment approach utilizes a prodrug delivery method that leverages a commensal *Lactobacillus* strain that binds specifically to cancer cells. These engineered bacteria carry a prodrug that converts to the chemotherapy drug SN-38 at the tumor site. In preclinical models of nasopharyngeal cancer, the bacteria localized specifically in the tumor and released the chemotherapy drug directly at the cancer site, resulting in a 67% reduction in tumor growth and a 54% increase in the effectiveness of the chemotherapy drug.

Lead Researcher Dr. Shen Haosheng highlighted the potential for broader applications of this research across various types of cancer therapy, as the *Lactobacillus* strain identified by the researchers binds specifically to cancer cells. The team aims to develop a versatile delivery system using microbial strains to target chemotherapy drugs to various mucosal cancers, such as colorectal, bladder, stomach, oral, lung, and nasal cancer.

This innovative research represents a significant step towards developing a more targeted and less toxic approach to fighting cancer. The findings have been published in *Nature Communications*, showcasing the potential for a new clinical treatment for cancer patients. The team hopes that this research will pave the way for therapies that are both mild and effective in the fight against cancer.

Vocabulary List:

1. **Groundbreaking** // (adjective): Innovative and pioneering introducing new ideas or methods.
2. **Precise** // (adjective): Exact accurate and clearly defined.
3. **Potent** // (adjective): Having great power influence or effect.
4. **Commensal** // (adjective): Living in close association with another without harming it.
5. **Preclinical** // (adjective): Relating to the testing or investigation of a drug or treatment before testing on humans.
6. **Efficacy** // (noun): The ability to produce a desired or intended result.

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which type of animals can live both on land and in water?

- Option: A. Fish
- Option: B. Birds
- Option: C. Amphibians
- Option: D. Reptiles

2. What do you call an organism that benefits from another organism without affecting it?

- Option: A. Parasite
- Option: B. Predator
- Option: C. Commensal
- Option: D. Host

3. Which type of cancer affects the skin cells that produce pigment?

- Option: A. Melanoma
- Option: B. Leukemia
- Option: C. Lymphoma
- Option: D. Sarcoma

4. What is the term used to describe people who move from place to place rather than settling in one location?

- Option: A. Nomadic
- Option: B. Sedentary
- Option: C. Urban
- Option: D. Agricultural

5. Which term refers to the ability of a product to produce a desired or intended result?

- Option: A. Utility
- Option: B. Efficacy
- Option: C. Potency
- Option: D. Resilience

6. What term describes something innovative or pioneering?

- Option: A. Standard
- Option: B. Traditional
- Option: C. Groundbreaking
- Option: D. Conventional

7. Which healthcare professional specializes in restoring movement and function?

- Option: A. Dentist
- Option: B. Surgeon
- Option: C. Physiotherapist
- Option: D. Psychiatrist

8. In epidemiology what term is used to describe the frequency of new cases of a disease within a specified period?

- Option: A. Prevalence
- Option: B. Mortality
- Option: C. Incidence
- Option: D. Chronicity

9. Which term represents a state of growing vigorously or being successful?

- Option: A. Declining
- Option: B. Stagnant
- Option: C. Thriving
- Option: D. Floundering

10. Which medical professional specializes in diagnosing and treating skin disorders?

- Option: A. Cardiologist
- Option: B. Gynecologist
- Option: C. Dermatologist
- Option: D. Neurologist

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. _____ birth is when a baby is born before 37 weeks of pregnancy.

12. Patients with psoriasis may experience skin _____ during stressful periods.

13. The new drug has shown to be extremely _____ in treating the illness.

14. The research study found _____ errors in the data analysis that had to be corrected.

15. Performance-enhancing substances are _____ in professional sports.

16. The _____ of diabetes has been steadily increasing in the population over the past decade.

17. The _____ of flu cases usually rises during the winter months.

18. Dr. Smith is an _____ figure in the field of astronomy known for groundbreaking research.

19. Some diseases are linked to _____ inherited mutations.

20. The newly opened restaurant is _____ despite the competitive market.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The genetic variations that result in differing characteristics within a population.

22. A method of fishing using a sharp implement to catch fish underwater.

23. Accurate and exact in measurement or amount.

24. An organism that benefits from a relationship with another without causing harm or benefit.

25. The stage of testing a drug before clinical trials in humans.

26. Places where services like massages beauty treatments and hair styling are offered.

27. Having great depth or seriousness showing intellectual depth.

28. The frequency of occurrence of new cases of a disease in a specific population over a period of time.

29. Having great power influence or effect.

30. A medical professional who specializes in diagnosing and treating skin disorders.

Answer

Multiple Choice: 1. C. Amphibians 2. C. Commensal 3. A. Melanoma 4. A. Nomadic 5. B. Efficacy 6. C. Groundbreaking 7. C. Physiotherapist 8. C. Incidence 9. C. Thriving 10. C. Dermatologist

Gap-Fill: 11. Premature 12. Flare-ups 13. Potent 14. Numerous 15. Banned 16. Prevalence 17. Incidence 18. Esteemed 19. Genetically 20. Thriving

Matching sentence: 1. Mutations 2. Spearfishing 3. Precise 4. Commensal 5. Preclinical 6. Parlours 7. Profound 8. Incidence 9. Potent 10. Dermatologist



CATEGORY

1. Health - LEVEL6

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