



# 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.

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## 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



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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. )**

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| 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.                               |



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| 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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