

# “Immunotherapy”

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## 1. Introduction

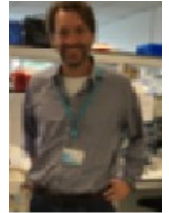
“Immunotherapy” is a kind of cancer cure which makes use of the patients’ own immune system. It is now drawing attention because patients’ physical burden is so small. However, it has not been put into practical use very much yet. Its cost and side effects prevent it from being used.

## 2. Methods

I discussed my hypothesis and asked my research questions at the University of Cambridge. I met with Dr.Francesco Colucci ( Pic.1 ) and Prof.Klaus Okkenhaug ( Pic.2 ) .



Pic.1 Dr.Francesco Colucci



Pic.2 Prof.Klaus Okkenhaug

### My Hypothesis

The baby who has the high possibility of carcinogenesis for the genetic information can inhibit it by having immunotherapy by the time he or she gets 6 months old.

### Research Questions

- 1) Is it possible that the patients, who have immune deficiency undergo immunotherapy ?
- 2) When does immunotherapy work effectively, in early stage of cancer or in terminal stage of cancer ?
- 3) What is the biggest problem of immunotherapy these days ?

## 3. Results (answer to my hypothesis and research question)

### Results

Dr.Francesco Colucci’s Answer to My Hypothesis

⇒ ***It is difficult.*** The baby may show much **stronger side effects** than people of other age.

Prof.Klaus Okkenhaug’s Answer to My Hypothesis

⇒ ***It may be possible.*** If the doctors can get the baby’s **cold blood**, grow CAR-T cells from that , and preserve them by freezing, they can treat him effectively even when he grows up.

### Answers to my Research Questions

- 1) It depends on the kind of immunotherapy.  
⇒ **Yes** CAR-T therapy (Fig.1)  
CAR-T therapy is **independent** of the host immune system,  
**No** immune checkpoint inhibitor (Fig.2) but immune checkpoint inhibitor is not.
- 2) In **both** of stages.  
This is not a problem of immunotherapy, but **chemotherapy** works more effectively in early stage.
- 3) To tell whether the patients may **respond or not**. The research to **identify** patients who may respond or not has been continued.

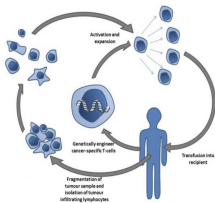


Fig.1 the mechanism of CAR-T therapy

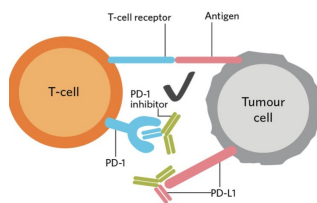


Fig.2 example of immune checkpoint

## 4. Discussion

**CAR-T therapy** may be able to be effective against tumor that babies or people who have immune deficiency have, so it is important to increase the kind of cancer that CAR-T therapy can cure. Also, **the way to identify patients respond or not** is necessary.

## 5. Conclusion

Immunotherapy is a new therapy, so many parts still remain unexplained. To develop it, more research is needed. I hope more and more patients can be treated by immunotherapy.

## 6. Acknowledgements

I would like to thank Dr.Francesco Colucci and Prof.Klaus Okkenhaug, who discussed my research theme. Also, I would like to thank Ms.Keiko Kurokawa, Ms.Misaki Nakamura and Mr.Masato Suzuki for all their help.

## 7. References

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