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# Sustainable research and development Open Source Biotechnology

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## Background : Tragedy of Anti-common

Continuing active of research and development have been found some difficult recently because of patent system.

Cost of A = Research cost of A

Cost of B = Patent fee A + Research cost of B

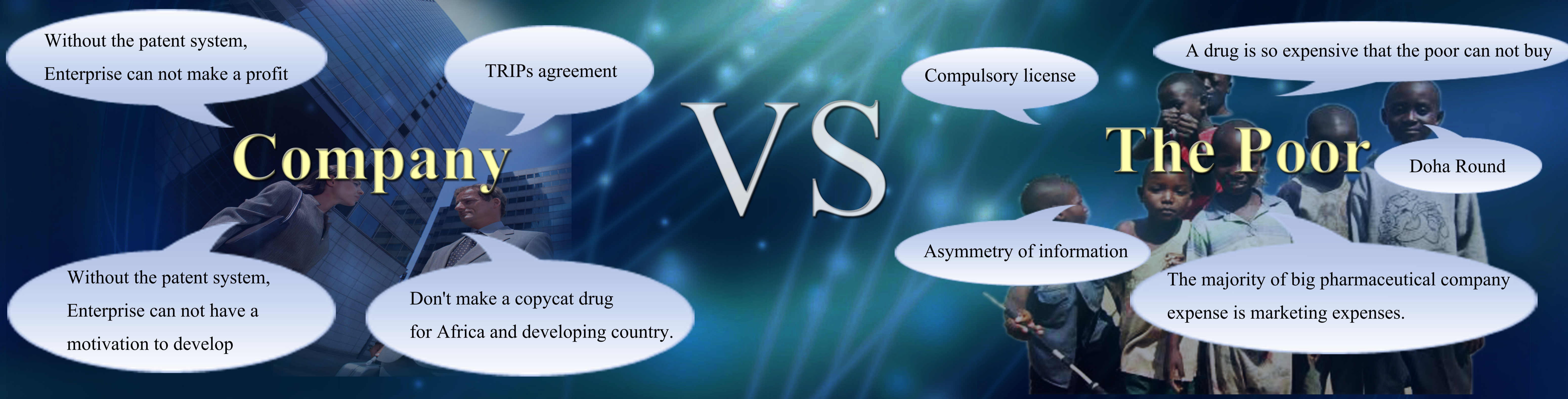
Cost of C = Patent fee A&B + Research cost of C

Cost of D = Patent fee A&B&C + Research cost of D

Thus this process will be costly for next person always. The research and development cost expands when this process continues. Furthermore, when researcher needs other different technologies with patent they must to pay for it. That will become more and more costly to researcher. This phenomenon is called "Tragedy of Anti-common".



## Conflict between company and the poor



There is a strongly impact when this phenomenon happens in food and drug development process. the company would conflict with consumer's interests, (especially poor people) But we cannot be completely satisfying the both side between consumer and company. If we support the consumer, company would not create new technology. If we support the patent system, many lives of the poor and consumer will be affected. For example that is big problem in third countries. Several ten million lives become suffer such as in Africa countries where the epidemic disease is more serious as HIV.

## Solution: Open Source Biotechnology

The research system called "Open source biotechnology" is advocated to save this conflict between companies and consumers. This system is forbidden to obtain the biotechnology patent fee from creator. Moreover, a new technology that is developed from the past technology cannot also obtain the patent fee. We also can cited open source for operation system of computer such as in Linux.

This system has the following points.

- This system can substitute the patent system, when patent system can not keep.
- A lot of researchers participate as volunteer.
- Crowd sourcing is possible.
- Low cost of research without patent fee.
- The company can discover new talent.
- A free research is not impossible.
- The researcher doesn't obtain the patent fee.
- A costly experiment will be difficult.

## Analysis & Result : Artificial Society

There are NPOs that practice in Open Source Biotechnology now. However, these organizations is still in experimentation process, And we can not analyze past cases. Thus I will develop one artificial society simulation program to study this new approach of Open source biotechnology. Artificial society is the specific agent for computer simulation in social analysis. Main factors is WTO, Big Pharma, and Gini coefficient etc. This simulation shows that it takes more ten years to complete now. When this system is completed, the society will cause the major change. A present unsustainable business model is out of fusion, and a new business model appears. In addition, the disease problem in Africa is improved.