

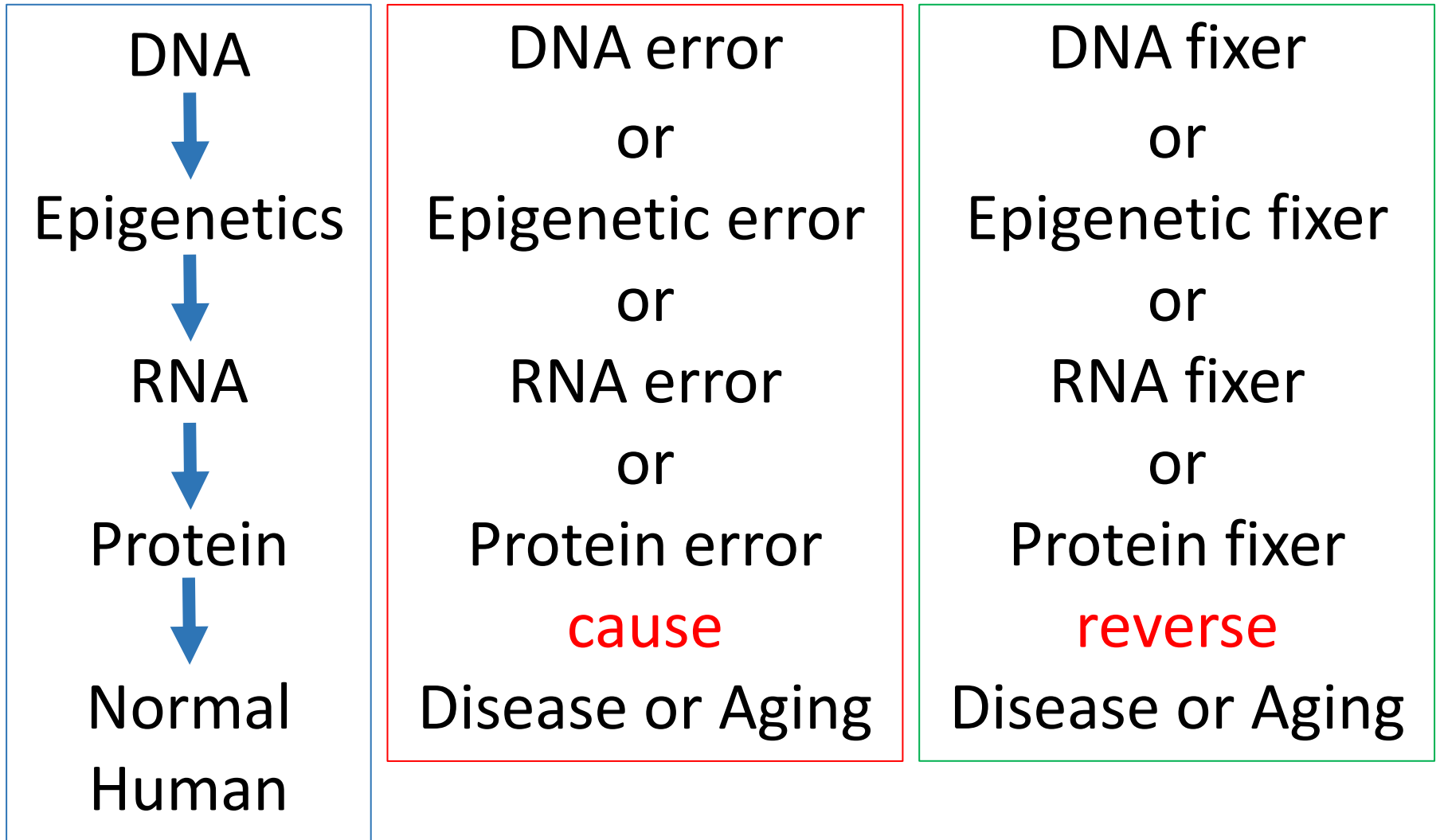
บริหารจัดการลักษณะทางพันธุกรรม (central dogma) คือแนวทางการพัฒนาของโลก:

๑ อดีต ปัจจุบัน และ อนาคต

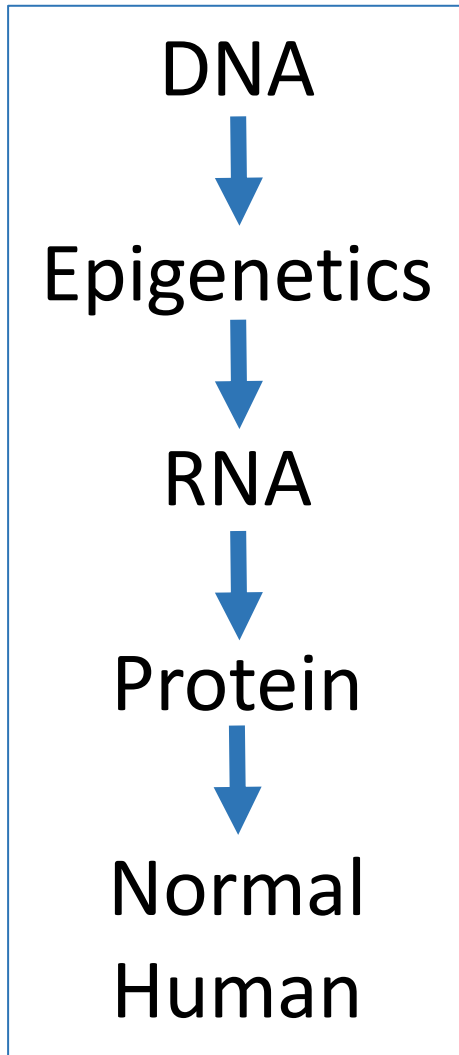
๒ ไทยควรทำอย่างไร

อภิวัฒน์ มุทิรางกูร

# Scientists are playing **God** by manipulating central dogma



# Scientists are playing **God** by manipulating central dogma



DNA error  
or  
Epigenetic error  
or  
RNA error  
or  
Protein error  
**cause**  
Disease or Aging

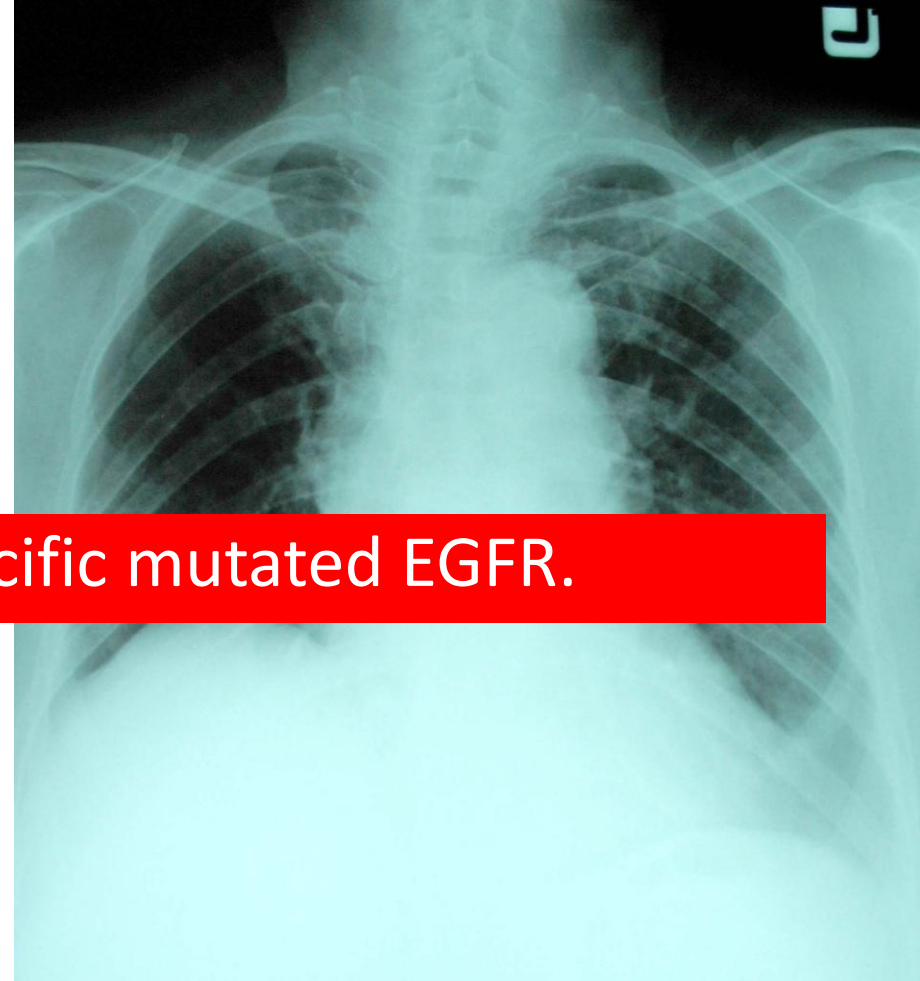
**crispr cas9**  
or  
Epigenetic fixer  
or  
**siRNA**  
or  
**Targeted therapy**  
**(protein inhibitor)**  
**reverse**  
Disease or Aging

# Current Success



Gefitinib targets specific mutated EGFR.

07/23/04 4 days pre-gefitinib  
PS (late) 2



08/06/04 10 days post-gefitinib  
(???)

# **Benefits of the fixers:**

**1. Study cell biology**

**2. Drug**

# Flow of research & roles of Thai research

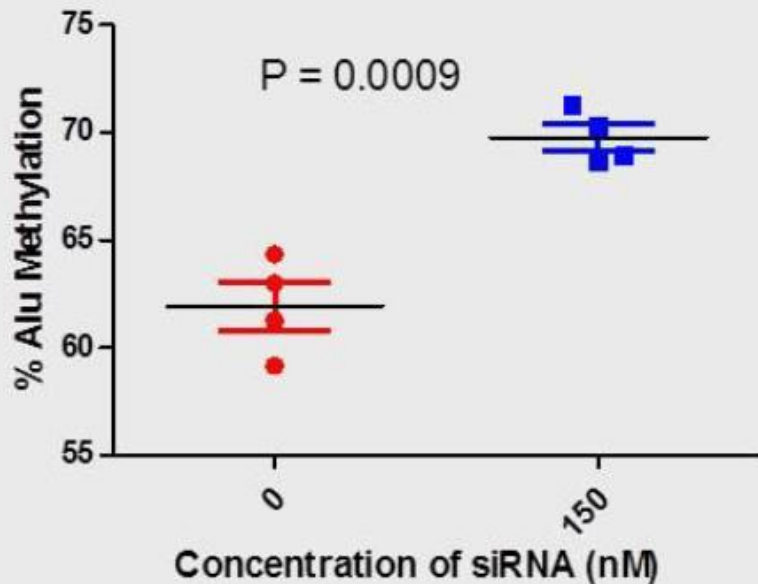
1. Develop and study the fixers
2. Identify errors
3. Fix error in vitro
4. Animal study
  - 4.1 Fix error in vivo
  - 4.2 Pharmacokinetics
  - 4.3 Prevent harm to normal cells
5. Clinical study

# Flow of research & roles of Thai research

1. **Develop and study the fixers?**
2. Identify errors
3. Fix error in vitro
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or  
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Targeted therapy  
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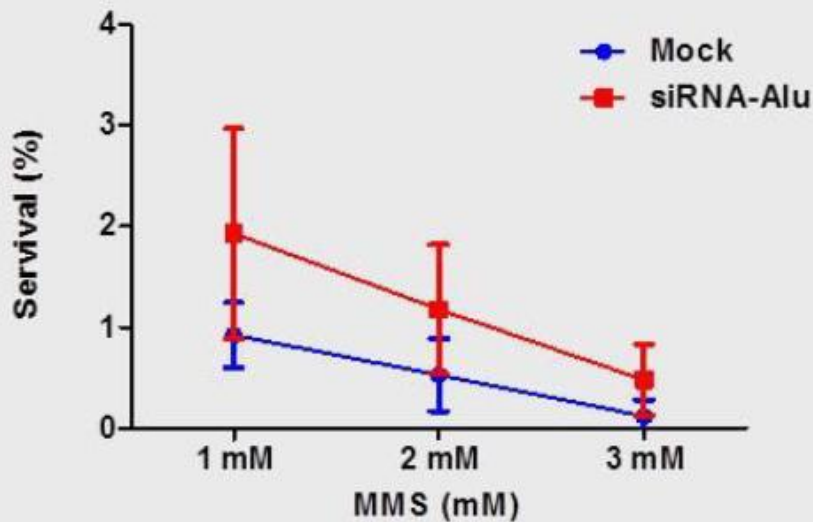
siRNA-Alu Transfection in HEK cells  
48 hrs.



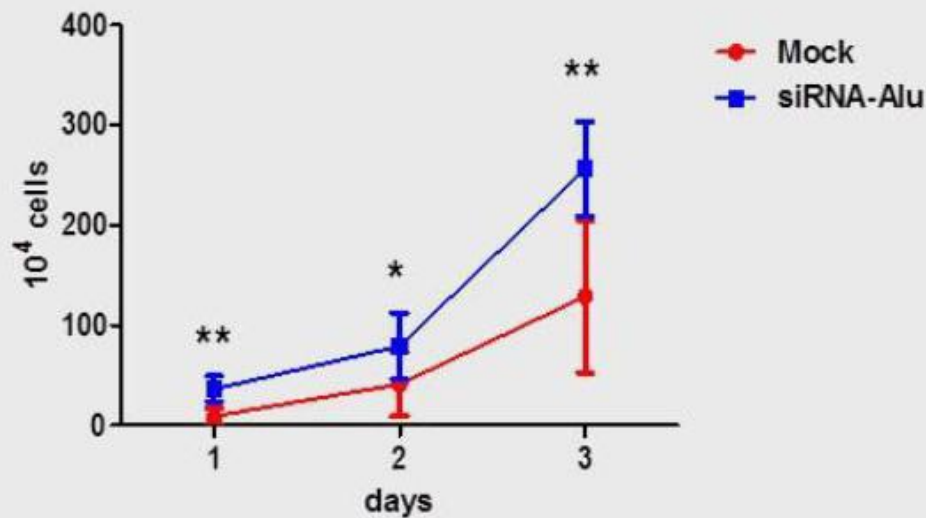
On going research

ยากันหรือแก้ “ความชรา” โดยการ  
เพิ่มความเสถียรของ ดีเอ็นเอ

MMS sensitivity



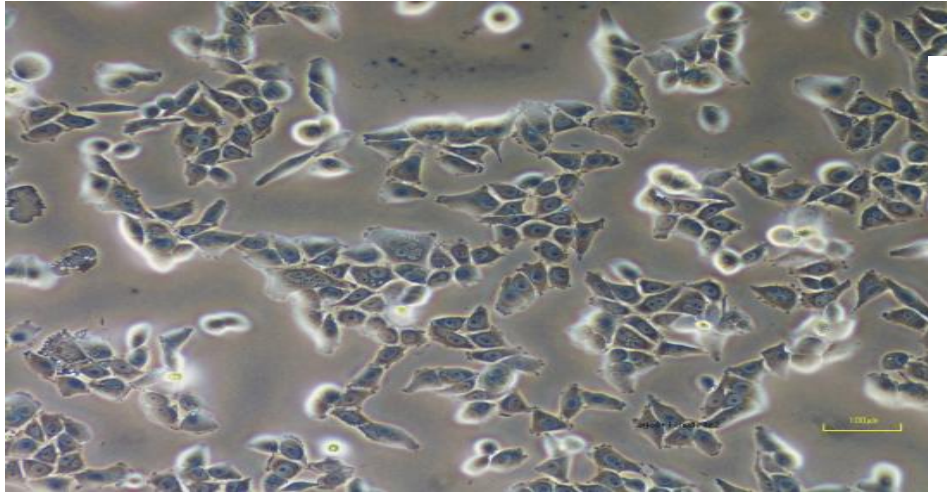
Proliferation (cell count assay)



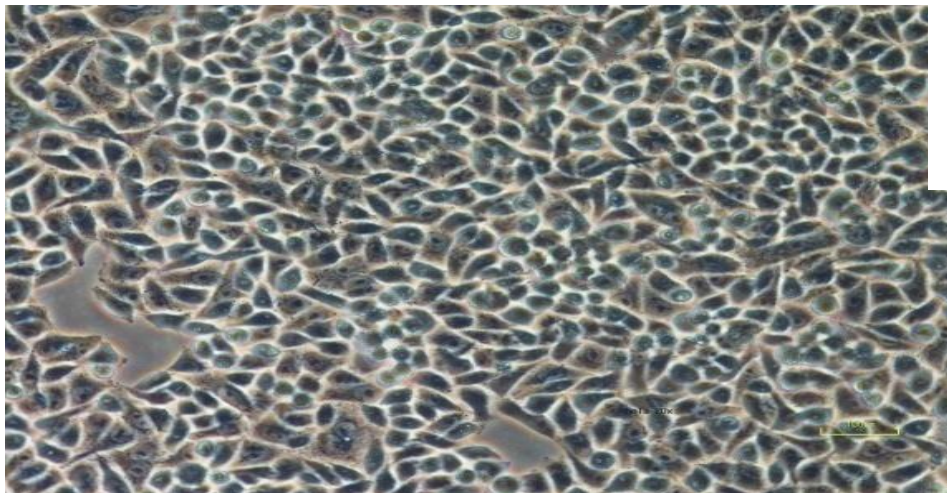


# RESULT OF LINE-1 METHYLATION EDITING UNPUBLISHED DATA

LINE-1 methylation editing in HeLa

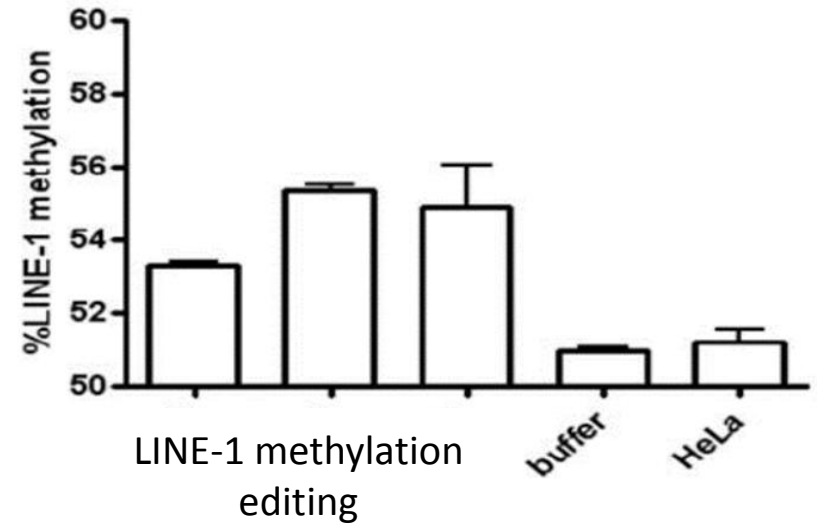


Untransfected HeLa



2 replications

av. LINE1 in hela



# Discussion roles of Thai research

1. Develop and study the fixers
- 2. Identify errors**
- 3. Fix error in vitro**
- 4. Animal study**
  - 4.1 Fix error in vivo**
  - 4.2 Pharmacokinetics**
  - 4.3 Prevent harm to normal cells**
- 5. Clinical study**

Who  
&  
How