

เอนโดไลซิน ทางเลือกทดแทนยาปฏิชีวนะสำหรับ อุตสาหกรรมสัตว์น้ำ

Endolysins: antibiotic alternative for aquaculture

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ศูนย์พันธุวิศวกรรมและเทคโนโลยีชีวภาพแห่งชาติ

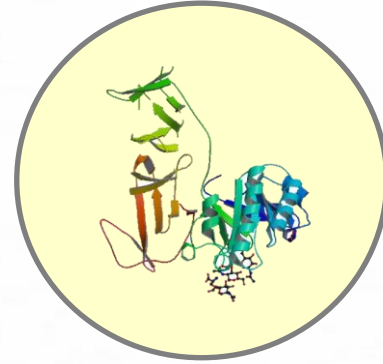
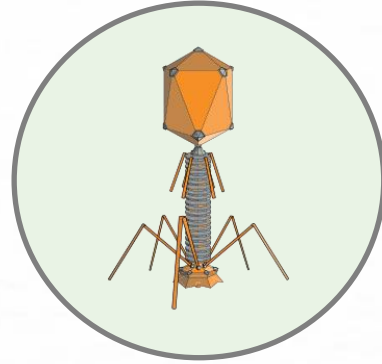
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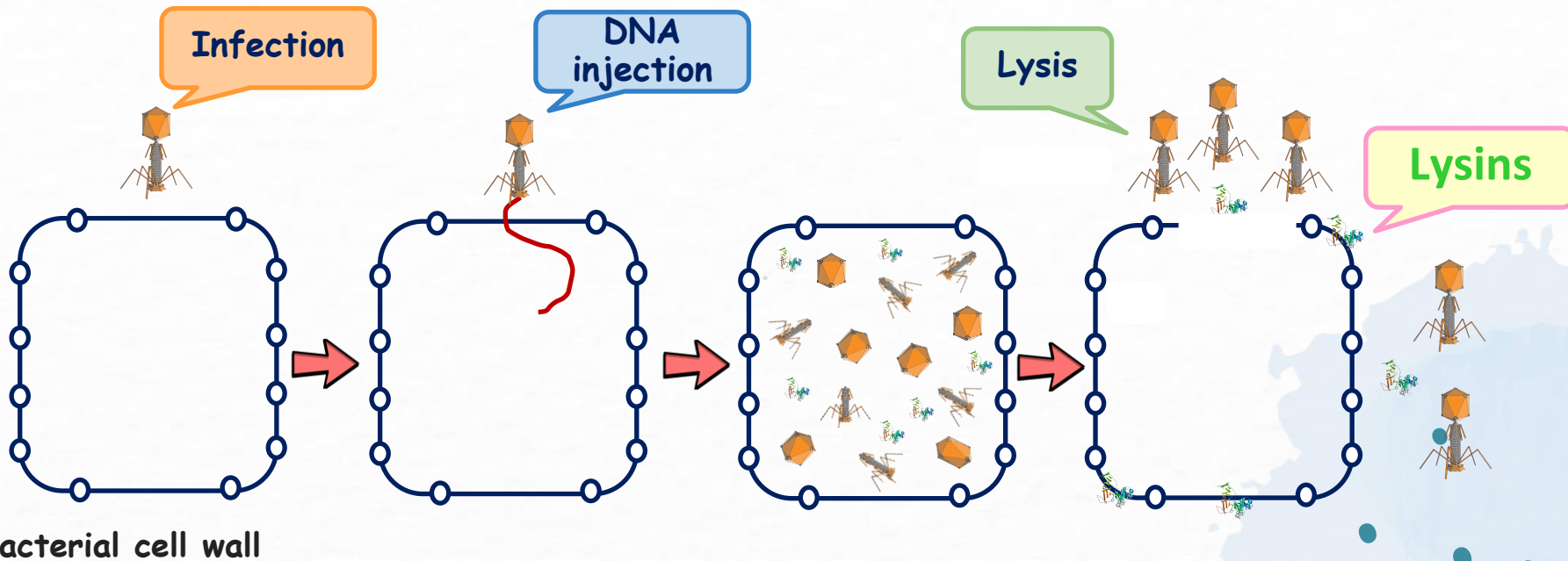
Origin of the Lysins

Bacteriophage

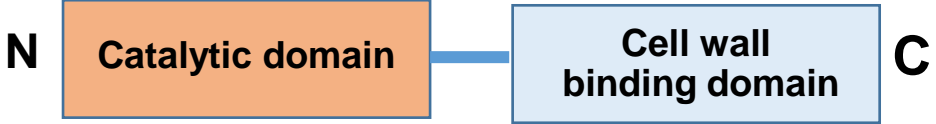
Predators (natural enemy) of bacteria **infect and kill** bacteria



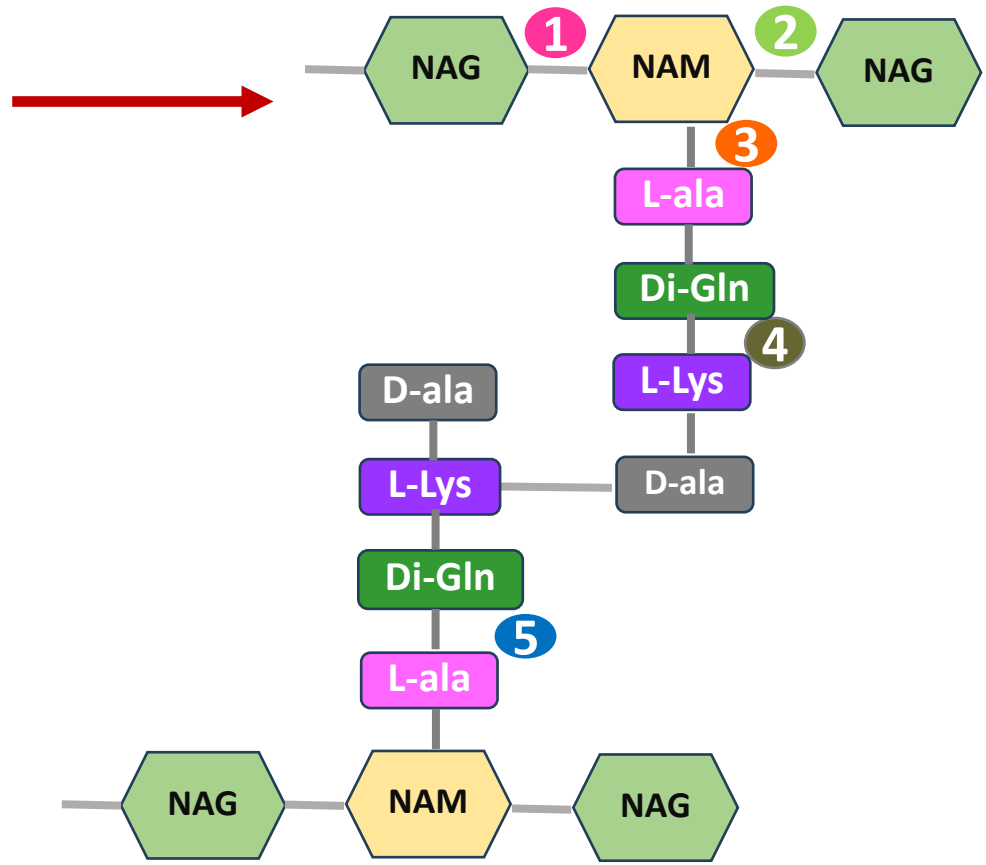
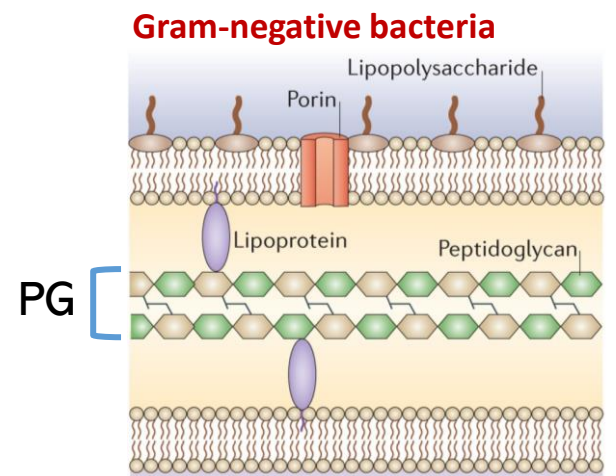
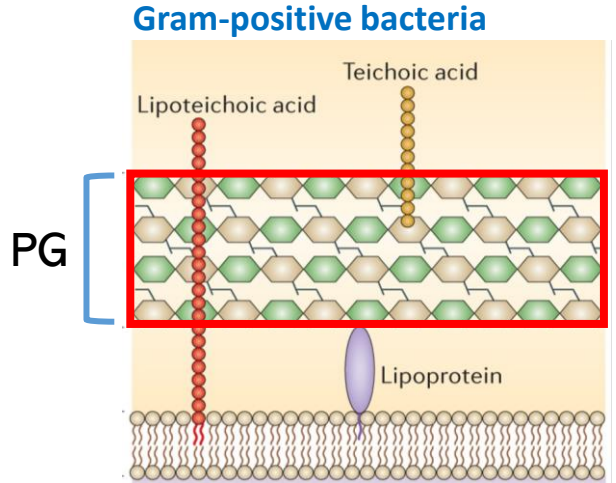
Lysins



Antibiotic alternative —LYSINS



Hydrolytic enzymes produced by phages to cleave PG during the final stage of lytic cycle



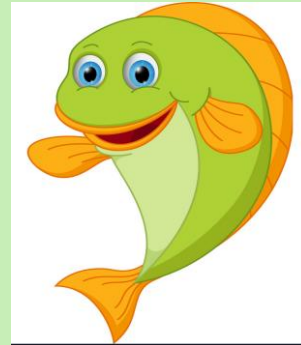
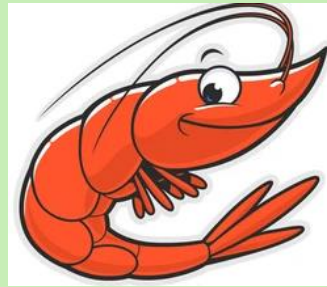
- 1 Glycosidase
- 2 Glycosidase
- 3 Amidase
- 4 Peptidase
- 5 Peptidase

Lysins:
 Host specific
 Fast killing

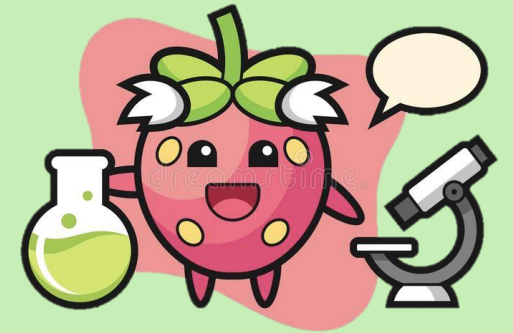
Applications...



**Human
Medicine**



Agriculture



**Food &
Biotechnology**

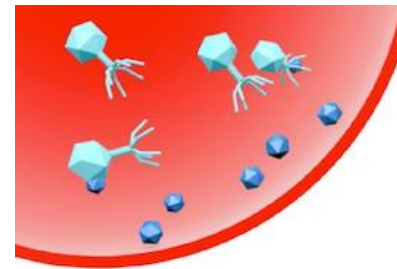
Staphefekt™

The world's first product that selectively kills *Staphylococcus aureus* including MRSA.



BREAKING NEWS

L'Oréal Signs License Agreement with Microcos



MICREOS

L'ORÉAL

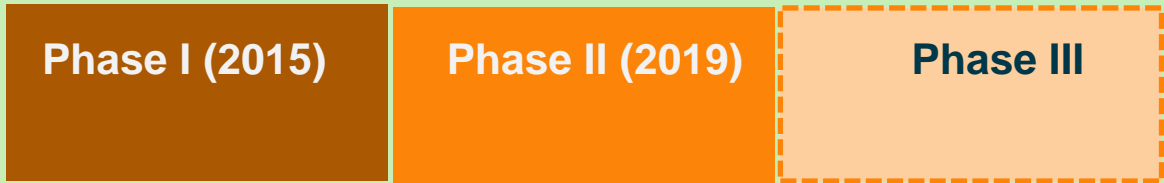




Exebacase (CF301)

a lysin with potent activity against *S. aureus*

Clinical trial phase 3 is being studied.

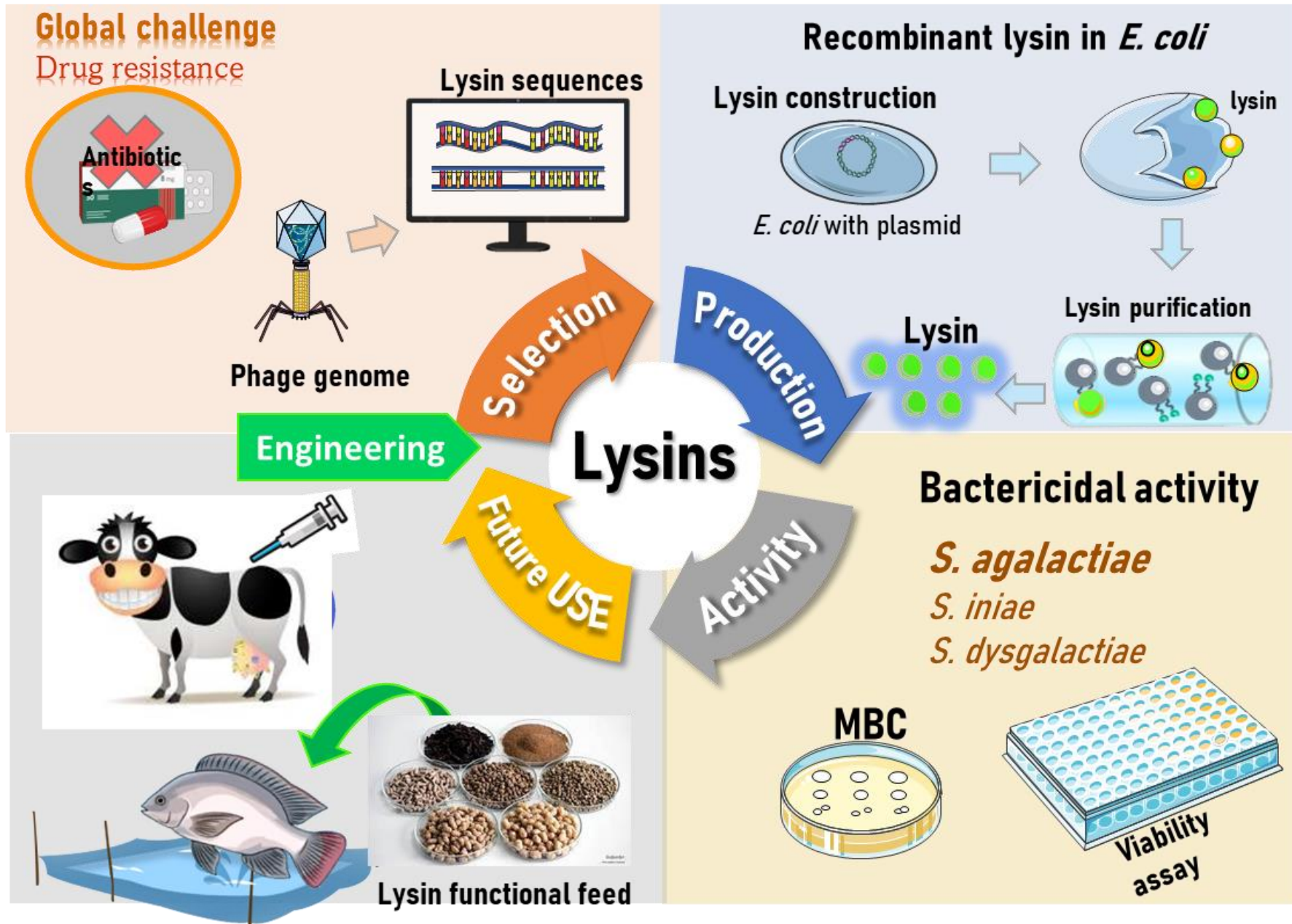


Streptococcus agalactiae (Group B streptococci; GBS)

- A β -hemolytic Gram positive bacteria
- A pathogen causing sepsis and meningitis in newborns, **streptococcosis in fish**, and **mastitis in cattle**
- Treatment : antibiotics
- Reported of antibiotic resistant bacteria

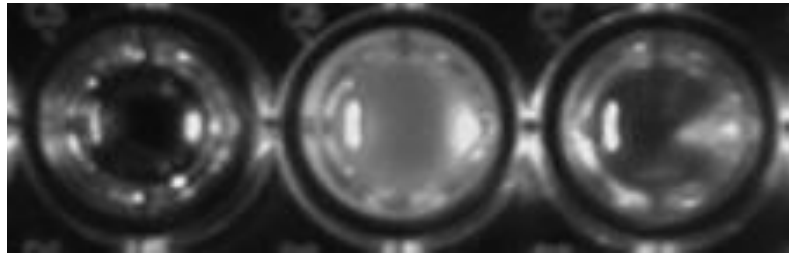


C-lysin against *S. agalactiae*



C-lysin possesses anti-*S. agalactiae* activity with fast action

PBS	-	+	-
Sag	-	+	+
Lysin	-	-	+



C-Lysin exhibits anti-*Streptococci* activity

organisms	MBC (μM)
<i>S. agalactiae</i>	1.25 - 80
<i>S. dysgalactiae</i>	1.25
<i>S. uberis</i>	5
<i>B. subtilis</i>	NA

S. agalactiae include those with antibiotic sensitive and MDR strains

Conclusion

Lysins : a leading antimicrobial technology in a post antibiotic era

ANTIBIOTICS	LYSINS
Damage microbiome	Kill only targeted bacteria
Slow-acting	Fast-acting
Limited activity in biofilm	Work in biofilm
Resistance	Low resistance potential
Accumulate in environment	Rapidly biodegradable & not accumulate

Challenges/Opportunities :

- Applications e.g. fish functional feed
- Lysins against Gram negative bacteria
- Tailor-made lysins with desired properties



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