

For more information



Rebuilt cell-free system (PUREfrex<sup>®</sup>);

*beyond cell, beyond life with synthetic approach*



**Takashi Ebihara, Ph.D.**  
**COO**  
**GeneFrontier Corporation**

**iGEM 2024**  
**23-25 of Oct 2024**

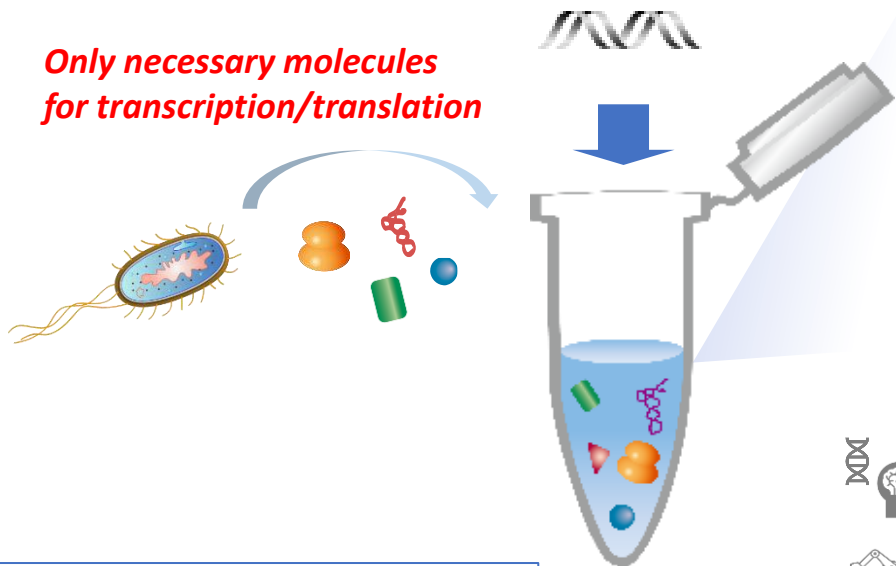


GeneFrontier

# PUREfres<sup>®</sup>

-Customize expression toolbox for your research-

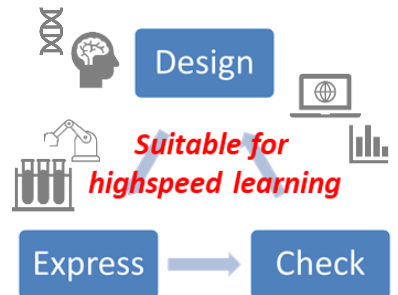
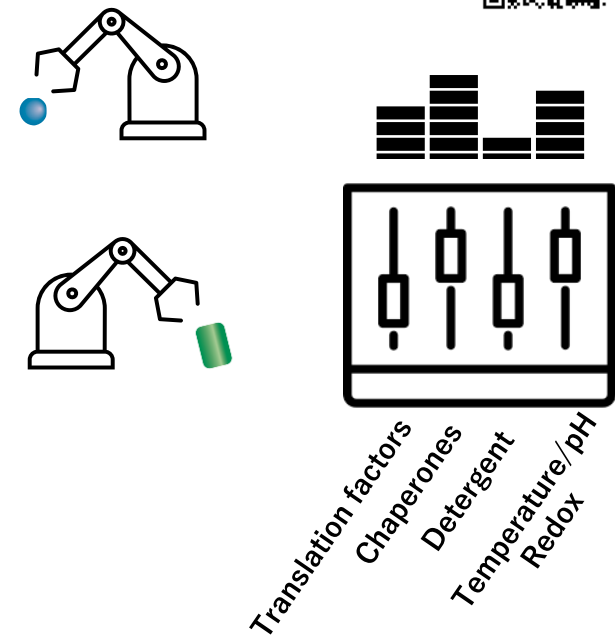
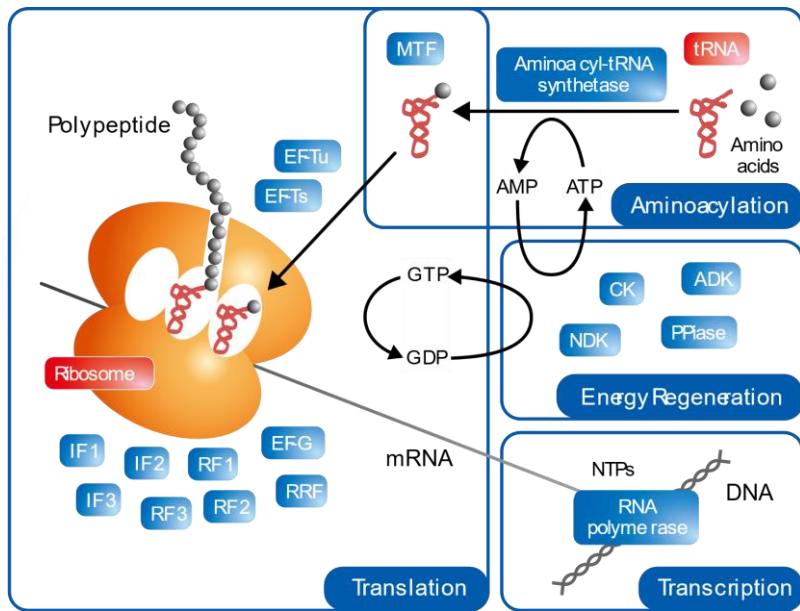
Only necessary molecules for transcription/translation



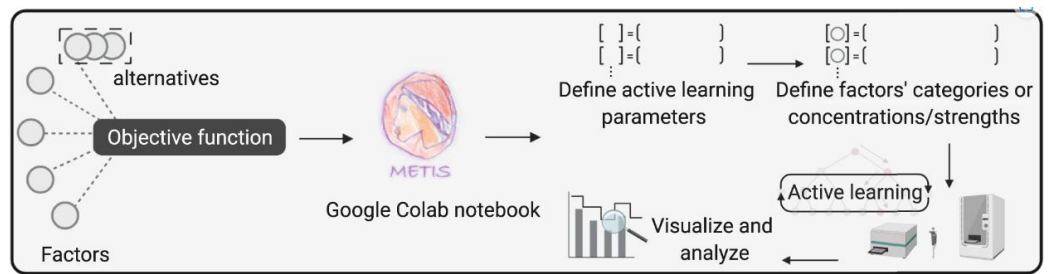
- ✓ Rebuilt cell-free system
- ✓ Tunable for your biologics
- ✓ Simple, Fast
- ✓ Suited for High throughput system
- ✓ Very low contaminants



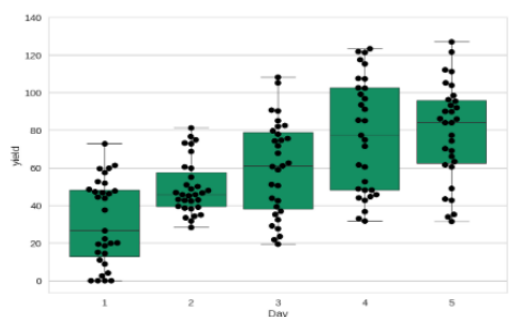
## Totally constructive, molecular based system



Suitable for highspeed learning



Pandi A et al. (2022) Nature Communications, 13, 3876.

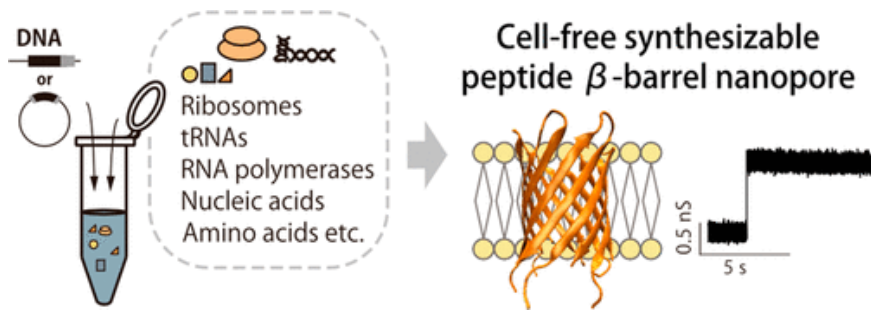


$\mu$ L ~ L scale  
Great Flexibility from basic research to industrial applications

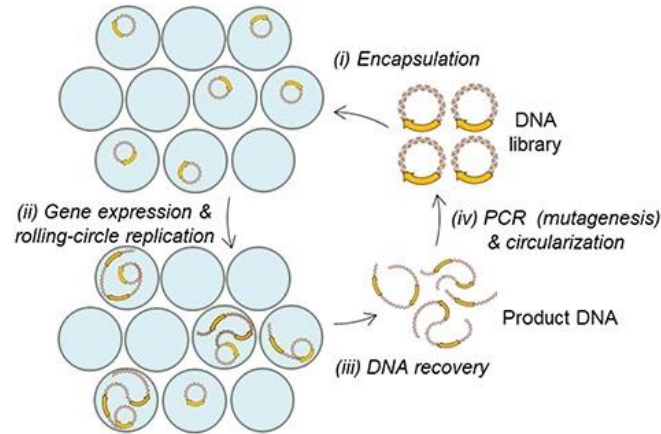
Versatile and Robust Platform for protein synthesis  
Huge potential as New platform in Biotech industry



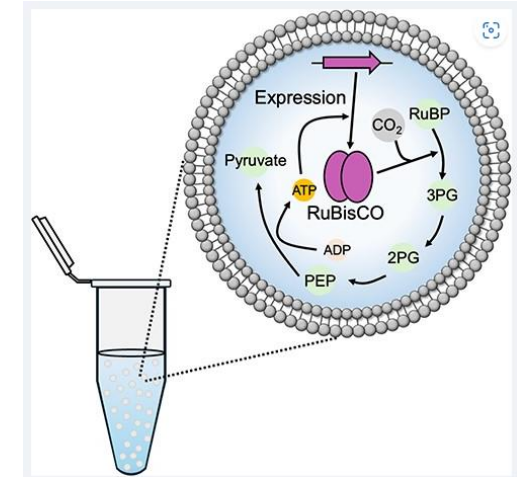
## -Broad applications, yet to come!-



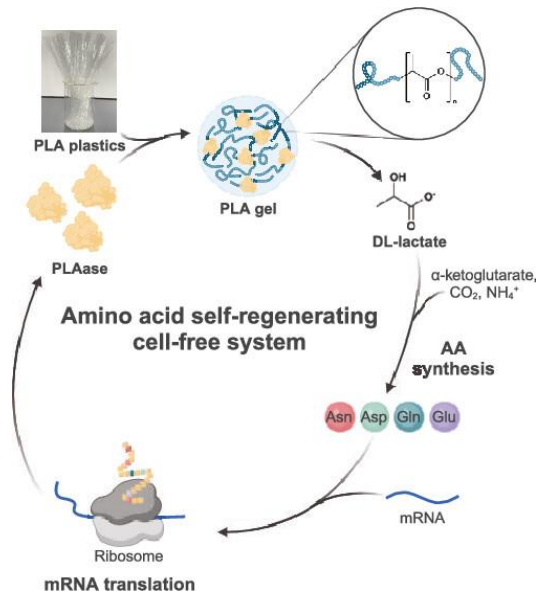
[Fujita et al. \(2023\) ACS Nano. vol.17\(4\), p.3358.](#)



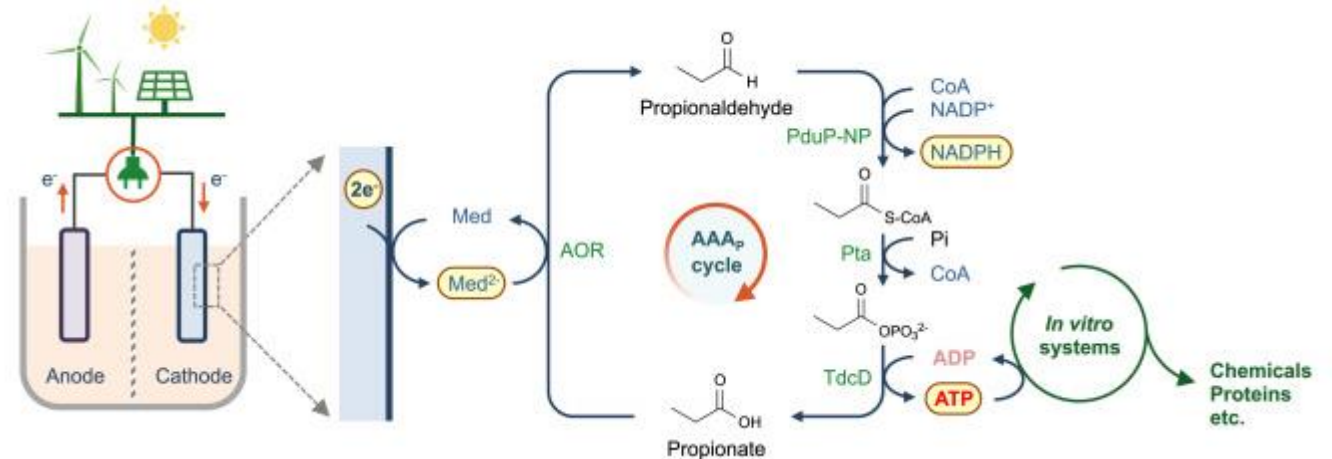
[Sakatani Y, et al. \(2019\) PEDS, 32\(11\) p481, <https://doi.org/10.1093/protein/gzaa011>](#)



[Sugii et al. \(2023\) Synth. Biol. vol.8, p1](#)



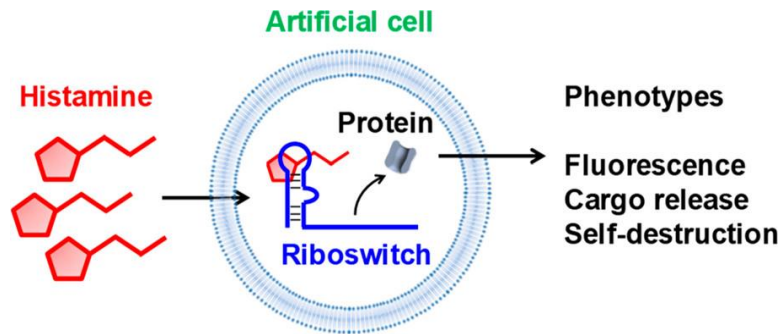
[Nishikawa et al. \(2024\) ACS. Catalysis. vol.14, 7696.](#)



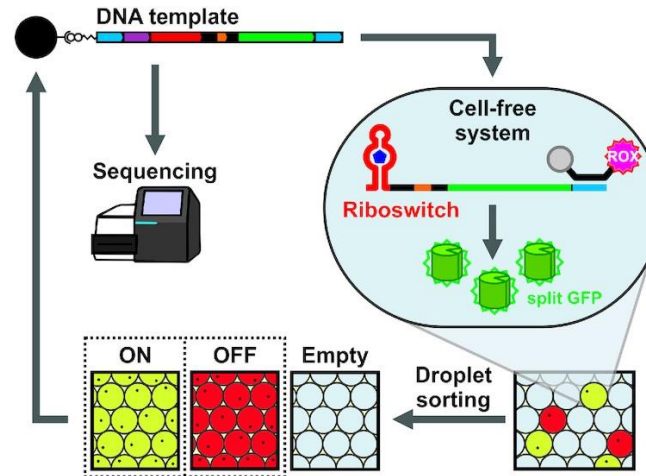
[Luo et al. \(2023\) Joule. vol.7, p1745](#)



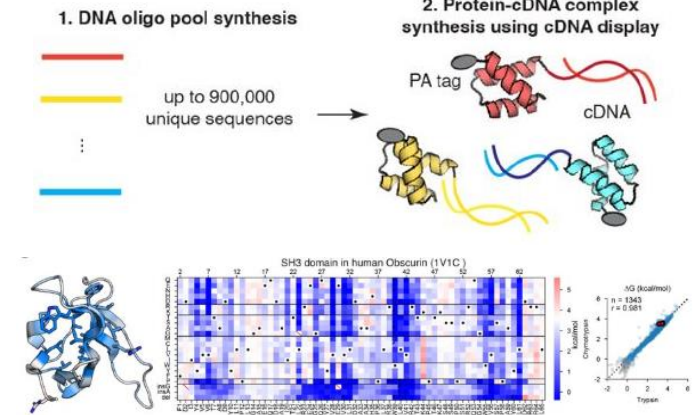
## -Broad applications, yet to come!-



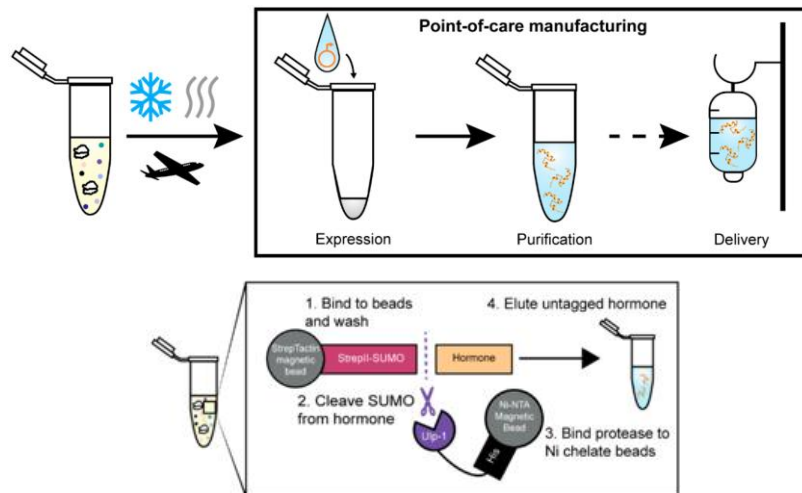
[Dwidar et al. \(2019\) J. Am. Chem. Soc. vol.141, p.11103.](#)



[Tabuchi et al. \(2022\) Nucleic Acids Res](#)  
<https://doi.org/10.1093/nar/gkac152>



[Tsuboyama et al. \(2023\) Nature, 620, p434.](#)



	1	2	3	4	5	6	7	8	9	10
	Proinsulin Aspart	Proinsulin Lispro	Proinsulin Glargine	Regular Proinsulin	Insulin A Chain	Insulin B Chain	Insulin A Chain Heterodimer	Insulin B Chain Heterodimer	Oxytocin	Glucagon
PURE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cim24	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓
BL21	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗
759	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗
	11	12	13	14	15	16	17	18	19	20
	Glucagon Like Peptide 1 mutant (GLP-1 mut)	Glucagon Like Peptide 1 (GLP-1)	Insulin Like Growth Factor	Growth Hormone (GH)	Leptin	Vaso-pressin	Angiotensin II	Parathyroid Hormone (PTH)	Somato- statin	Leuproli- de
PURE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cim24	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
BL21	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
759	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓

[DeWinter et al. \(2023\) ACS Synth. Biol. vol.12, 4, p1216.](#)



**To change the platform in biotech industry**

*To be free, or not to be free, from limitation of living system?*

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**Support program to iGEMers !!**

**Free reagent support for new ideas based on PUREfres**

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