

Development of elastase-resistant progranulin as a novel brain protection

【Key words】

Growth factor

elastase-resistant mutant

Drug discovery

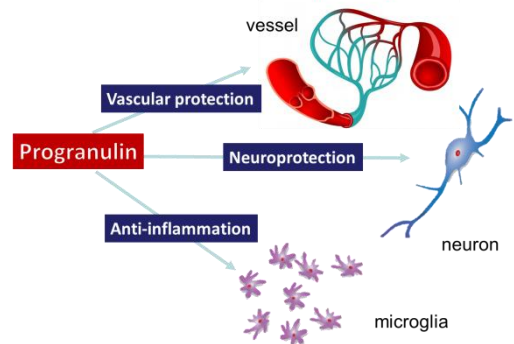
Ischemic stroke

Dementia

■ Summary

- We demonstrated that **a growth factor, progranulin (PGRN)** could protect against focal cerebral ischemia by a variety of mechanisms, which we call "brain protection", including neuroprotection, suppression of neuroinflammation, and attenuation of blood-brain barrier disruption (Brain 2015).
- We introduce the development of **elastase-resistant mutant progranulin** as a novel therapeutic agent.

Progranulin as a novel therapeutic growth factor



■ Subject Details

○ What is progranulin ?

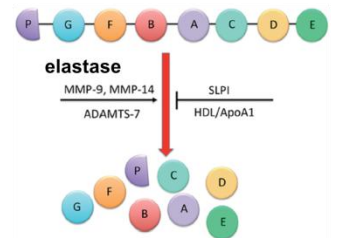
- In human, PGRN is considered to play crucial roles in maintaining physiological functions, and mutations in PGRN gene cause familial dementia.

○ Challenge for clinical application

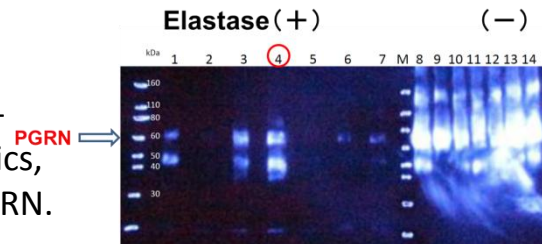
- Although PGRN might offer promising prospect as a therapeutic agent for several diseases, PGRN is disadvantageous in that **it is cleaved into pro-inflammatory granulins by elastase** activated after ischemia, resulting in a reduction of drug efficacy duration.
- To overcome this problem, we developed elastase-resistant mutant progranulin by using Bioinformatics, which can improve the duration and efficacy of PGRN.

Degradation of progranulin by elastase

progranulin (anti-inflammatory effect)



granulins (pro-inflammatory effect)



■ Fields of Research & Development

- We'd like to collaborate with **pharmaceutical companies**. This mutant PGRN might offer promising prospect as a therapeutic agent for **ischemic stroke, dementia, spinal cord injury, and inflammatory diseases including rheumatoid arthritis**.

Contact us

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