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LIFE SCIENCES
insights

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Progranulin – Marker of Neuroinflammation

Progranulin (PGRN) is a cysteine-rich protein, composed of seven ~6kDa granulin (GRN) proteins, that shows multifunctional biological activities, including major roles in cancer, inflammation, metabolic disease and neurodegeneration, especially as a valuable biomarker for Frontotemporal Lobar Degeneration (FTLD). PGRN is an abundant, non-conventional, stress-induced, extracellular matrix-bound secreted growth factor-like molecule and cytoplasmic chaperone, that functions in a cellular and disease specific pattern. PGRN binds to several functionally different receptor families in a cell/tissue specific and condition/disease-dependent manner. For example, PGRN binding with TNFR and DR3 has an important anti-inflammatory role in immune cells, particularly Tregs and macrophages. PGRN/Ephrin type-A receptor 2 (EphA2) interaction is involved in the proliferative influence of PGRN. PGRN binds and activates Notch receptors, enhancing the regenerative capacity of injured neurons. PGRN is also a lysosomal resident protein and sortilin and lipoprotein receptor-related protein 1 (LRP1) have been demonstrated to be the lysosomal trafficking receptors for PGRN with the help of Prosaposin. In the brain, PGRN is primarily expressed in mature neurons and microglia. Absence of progranulin in microglia causes increased production and release of multiple cytokines, suggesting that PGRN regulates microglia activation. PGRN seems to affect microglial proliferation, recruitment, differentiation, activation and phagocytosis, suggesting that PGRN plays a central role in the regulation of neuroinflammatory responses. In neurons, PGRN i) co-localizes in late endosomes and early lysosomes with the transmembrane protein TMEM106B, ii) co-localizes with markers such as BDNF along axons, iii) influences synaptic structure and functions at synaptic and extra-synaptic sites, where it is secreted in an activity-dependent manner, and iv) extracellular PGRN is endocytosed and delivered to lysosomes. The lysosomal function of PGRN is not well characterized, but probably involves regulation of proteins such as cathepsins, glucocerebrosidase (GBA) or TMEM106B and likely contributes to neurodegeneration (see **Figure**).

SELECTED REVIEWS: The lysosomal function of progranulin, a guardian against neurodegeneration: D.H. Paushter, et al.; Acta Neuropathol. **136,** 1 (2018) • Progranulin: A conductor of receptors orchestra, a chaperone of lysosomal enzymes and a therapeutic target for multiple diseases: Y. Cui, et al.; Cytokine Growth Factor Rev. **45,** 53 (2019)

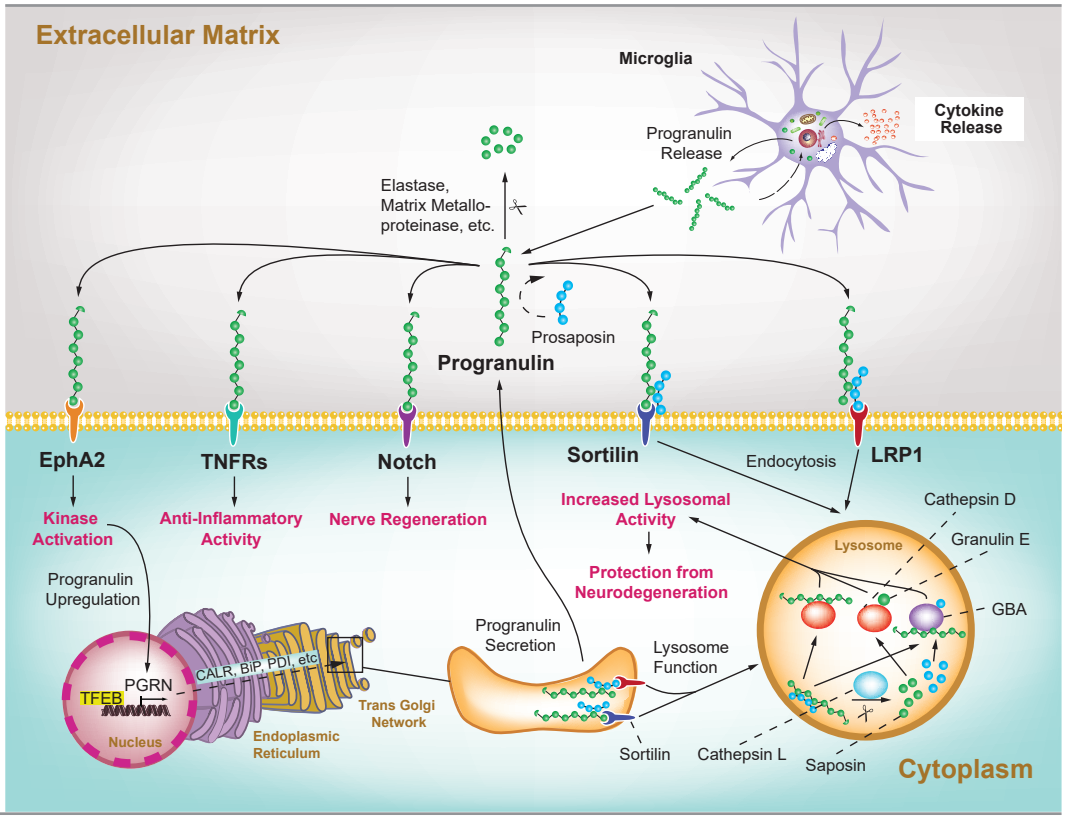

FIGURE: The roles and binding partners of progranulin in neuronal cells.

Standard Progranulin ELISA Kits

Progranulin (human) ELISA Kit AG-45A-0018Y
Progranulin (mouse) ELISA Kit AG-45A-0019Y
Progranulin (rat) ELISA Kit AG-45A-0043Y

- *Trusted Reproducible Results!*
- *Used to Determine Cut-Off values for FTLD!*
- *Cited in Hundreds of Scientific Publications!*

BULK

Tag-free Progranulins

Progranulin (human) (rec.) (untagged)
AG-40A-0188Y 10 µg | 50 µg
Progranulin (mouse) (rec.) (untagged)
AG-40A-0189Y 10 µg | 50 µg
Progranulin (rat) (rec.) (untagged)
AG-40A-0196Y 10 µg | 50 µg

- *Higher activity compared to tagged Progranulins*
- *Suitable for in vitro and in vivo studies*
- *Reflect the native sequence with no additional amino acids*
- *Affinity purified*
- *Low endotoxin levels (<0.01EU/µg)*

Progranulin Antibodies & Tagged Proteins

ANTIBODIES	PID	SIZE	ISOTYPE/SOURCE	APPLICATION	SPECIES
anti-Progranulin (human), pAb	AG-25A-0112	100 µg	Guinea pig	ELISA, IHC, WB	Hu
anti-Progranulin (mouse), pAb	AG-25A-0093	100 µg	Rat	ELISA, WB	Ms

PROTEINS	PID	SIZE	SOURCE	ENDOTOXIN	SPECIES
Progranulin (human) (rec.)	AG-40A-0068Y	10 µg | 50 µg	HEK293 Cells	<0.01EU/µg	Hu
Progranulin (rat) (rec.)	AG-40A-0194	10 µg | 50 µg	HEK293 Cells	<0.1EU/µg	Rt

Related Products

ANTIBODIES	PID	SIZE	ISOTYPE/SOURCE	APPLICATION	SPECIES
anti-Granulin C (human), pAb	AG-25A-0090	100 µg	Rabbit	ELISA, WB	Hu

PROTEINS	PID	SIZE	SOURCE	ENDOTOXIN	SPECIES
Granulin C (human) (rec.) (His)	AG-40A-0129	10 µg | 50 µg	E. coli	<1EU/µg	Hu

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