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**MATERIAL DATA SHEET**

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**Recombinant Human HSP70/HSPA1A****Cat. # AP-100**

Heat Shock 70kDa Protein (HSP70), also known as Heat Shock 70kDa Protein 1A (HSPA1A), is a 641 amino acid (aa) member of the HSP70 family of molecular chaperones with a predicted molecular weight of 70 kDa. Human HSP70/HSPA1A shares 95% and 97% aa sequence identity with the mouse and rat orthologs, respectively. It has an N-terminal nucleotide-binding domain, which contains ATPase activity, and a C-terminal substrate-binding domain (1). HSP70/HSPA1A promotes the proper folding of nascent polypeptides and assists in the refolding of denatured proteins (2). However, if either of these processes proceeds too slowly or fails, HSP70/HSPA1A can interact with the HSP40 co-chaperone protein and the CHIP/STUB1 Ubiquitin ligase (E3) to promote ubiquitination and degradation of the nascent polypeptide or denatured protein (3,4). HSP70/HSPA1A can be regulated post-translationally via multiple mechanisms, including phosphorylation, ubiquitination, and methylation (5-8). For example, unmethylated HSP70/HSPA1A localizes to the cytoplasm, but following methylation on Lys561 it is found only in the nucleus (8). Pathologically, HSP70/HSPA1A has been implicated in the promotion of multiple cancer types (8-10). Conversely, it is thought to protect against several neurodegenerative diseases that are caused by the accumulation of misfolded proteins (11,12).

**Product Information**

<b>Quantity:</b>	50 µg   100 µg
<b>MW:</b>	70 kDa
<b>Source:</b>	<i>E. coli</i> -derived Accession # AAD21816
<b>Stock:</b>	X mg/ml (X µM) in 50 mM HEPES pH 8, 100 mM NaCl, 5 mM DTT
<b>Purity:</b>	>95%, by SDS-PAGE under reducing conditions and visualized by Colloidal Coomassie® Blue stain.

**Use & Storage**

**Use:** HSP70/HSPA1A is a molecular chaperone that assists in the folding of nascent polypeptides and the refolding of denatured proteins, but can also promote their degradation in conjunction with specific E3 ligases, such as CHIP, if either of these processes proceeds inefficiently. Reaction conditions will need to be optimized for each specific application. We recommend an initial HSP70/HSPA1A concentration of 2-3  $\mu$ M for *in vitro* use. **IMPORTANT:** HSP40/DNAJB1 (Catalog # AP-110), or another suitable co-chaperone, is required for HSP70/HSPA1A activity and should be used at a concentration that is equimolar to HSP70/HSPA1A.

**Storage:** Use a manual defrost freezer and avoid repeated freeze-thaw cycles.

- 12 months from date of receipt, -70 °C as supplied.
- 3 months, -70 °C under sterile conditions after opening.

**Literature****References:**

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***For research use only. Not for use in humans.***