

Heat Shock Proteins: The Cellular Repair Crew

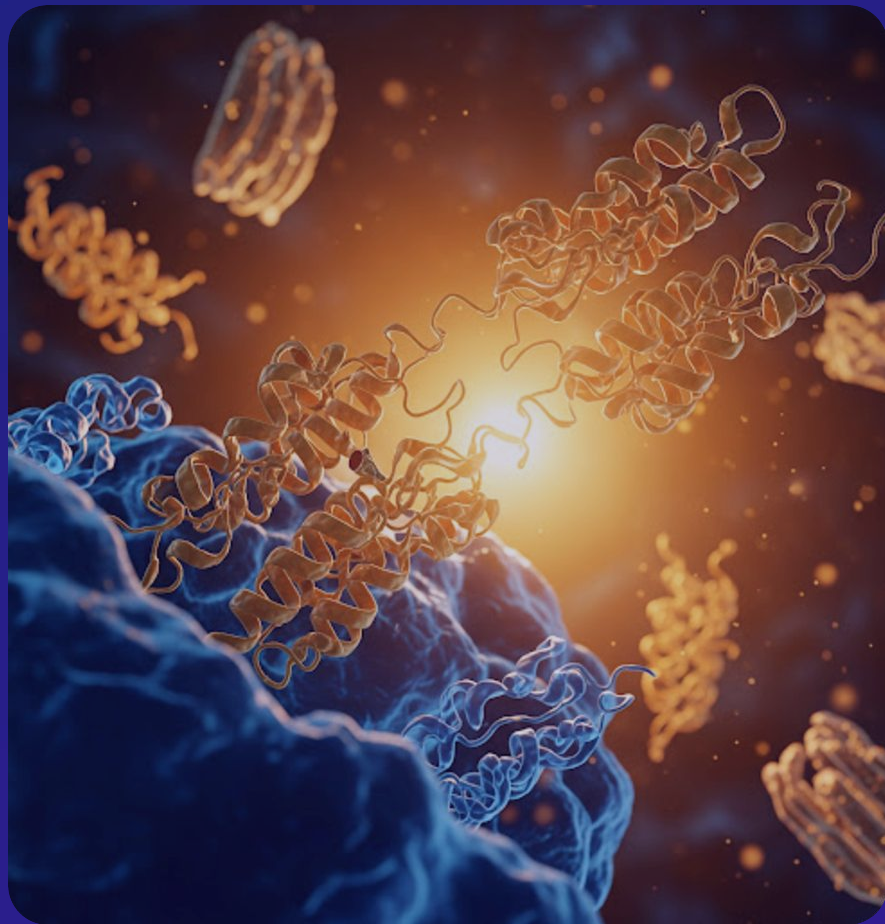
The Protein Origami

Proteins must be folded into specific shapes to function. Heat, exercise, and aging cause them to unravel or "denature."

Cellular "Garbage"

Denatured proteins clump together, creating cellular waste that contributes to aging and chronic disease.

PATIENT RESOURCES



The Clinical Evidence: Cardiovascular & Neuroprotective Impact

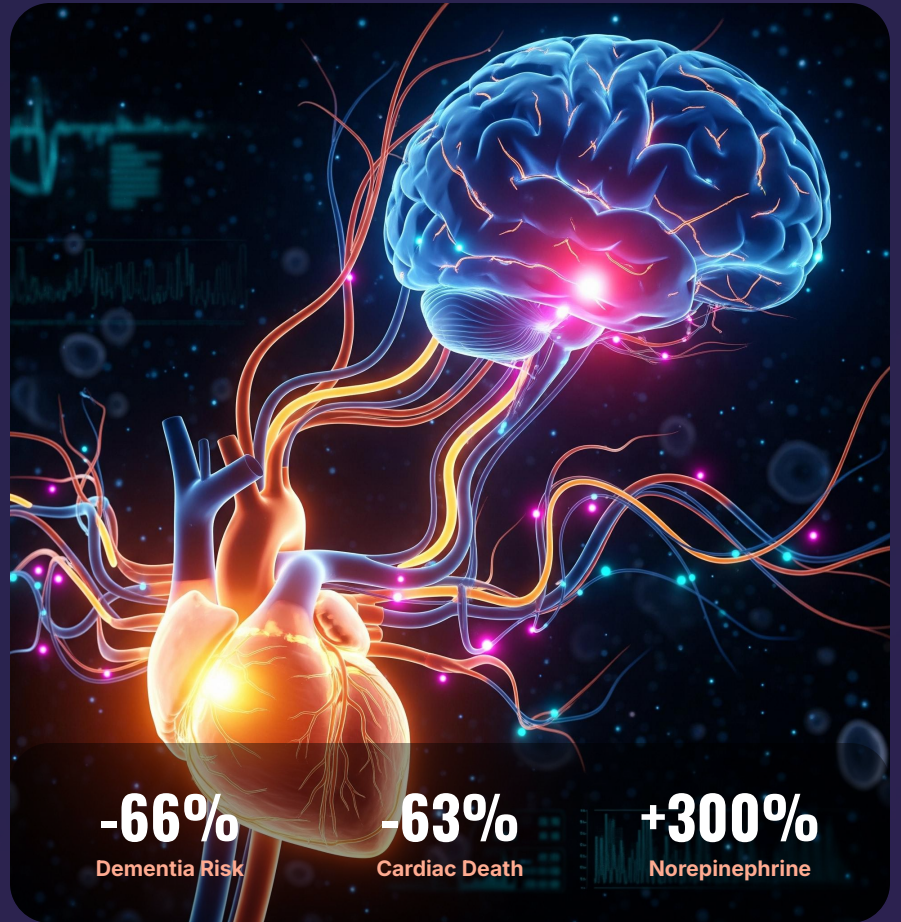
Thermal therapies protect your vascular network and brain as you age through deliberate physiological interventions.

1. Cardiovascular & Stroke Prevention

- **Mortality:** High-frequency use (4-7x/wk) yields a **63% reduction** in sudden cardiac death and **40% lower** all-cause mortality.
- **Stroke:** **61% lower risk** compared to once-weekly.
- **Vascular:** Infrared heat improves endothelial lining and reduces arterial stiffness.

2. Neuroprotection & Cognitive Longevity

- **Dementia:** 4-7x/wk usage leads to a **66% reduction** in dementia risk and **65% reduction** in Alzheimer's.
- **BDNF:** Heat stress triggers brain "fertilizer" for growth.
- **Synapses:** Cold shock protein **RBM3** rebuilds brain cell connections.
- **Focus:** Cold plunges boost norepinephrine by up to **300%**.



What are Heat Shock Proteins?

HSPs are **molecular chaperones**. Production skyrockets during stressors like **sauna heat** to protect cellular integrity.

1. Refolding Proteins

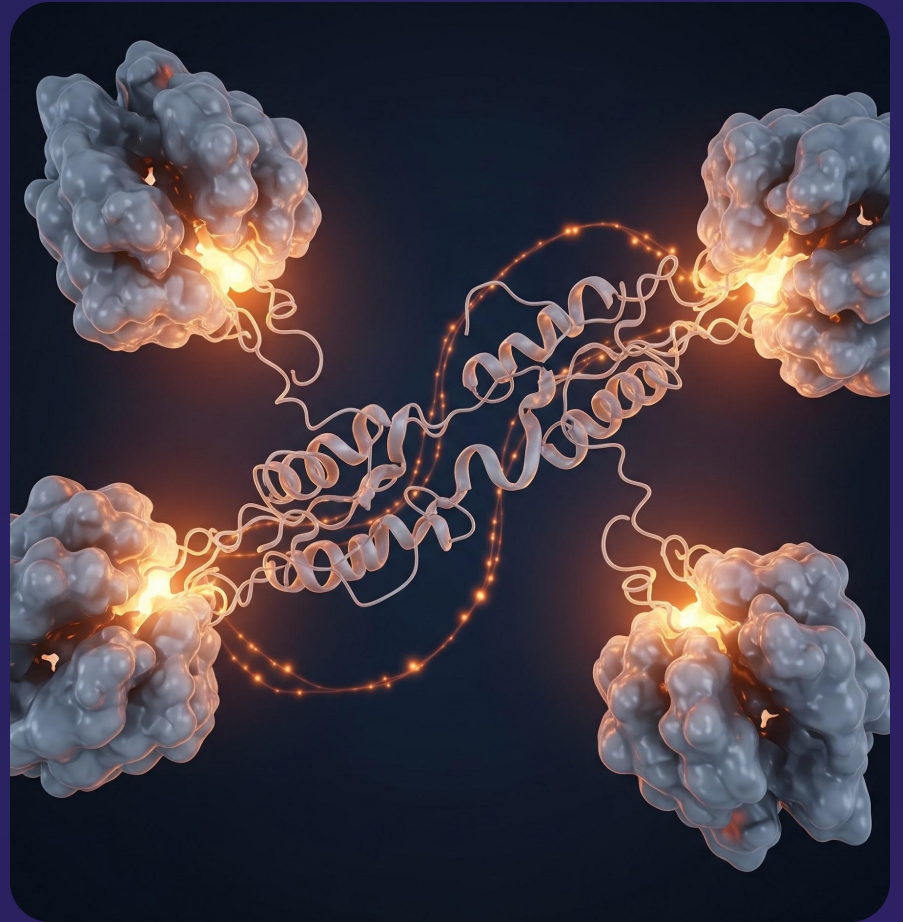
Acts like a mold, forcing unraveled proteins back into functional shapes.

2. Preventing Aggregation

Shields damaged proteins to prevent toxic clumps seen in Alzheimer's.

3. Cellular Cleanup

Tags and escorts waste to the cell's recycling center for clearance.



Thermal Therapy Protocols: Traditional Sauna, Infrared, & Cold Plunge

To trigger longevity proteins, we utilize **hormesis**—brief, intermittent exposure to mild stressors yielding profound health benefits.



Traditional Finnish Sauna

Temperature
80°C - 100°C

Frequency
4-7x / week

Duration: 20 mins

Robust data shows a 40% reduction in all-cause mortality and 60% lower Alzheimer's risk. Strongly triggers HSP70.



Far-Infrared Sauna

Temperature
50°C - 65°C

Frequency
3-5x / week

Duration: 30-45 mins

Uses light waves to penetrate tissues. Great for cardiovascular support and blood pressure regulation.



Cold Plunge

Temperature
10°C - 15°C

Target
Hormetic Stress

Deliberate cold exposure protocols for patients. Summary of evidence-based modalities for cellular health and resilience.

Practical Patient Guidance & Safety

The Contrast Effect

Combining sauna with cold plunge (Nordic cycle) maximizes circulatory flush. End on cold for alertness.

Safety & Limits

Hormesis must stay mild. Patients should exit immediately if feeling dizzy or lightheaded.

Hydration Mandate

Hydration is non-negotiable. Match sweat loss with mineral-rich fluids or electrolytes.

PATIENT RESOURCES

