

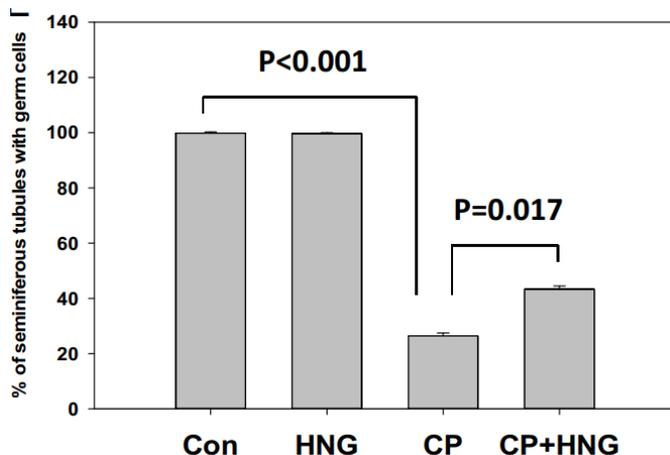
A humanin analog to prevent chemotherapy-induced germ cell apoptosis [LAB0034]

Background

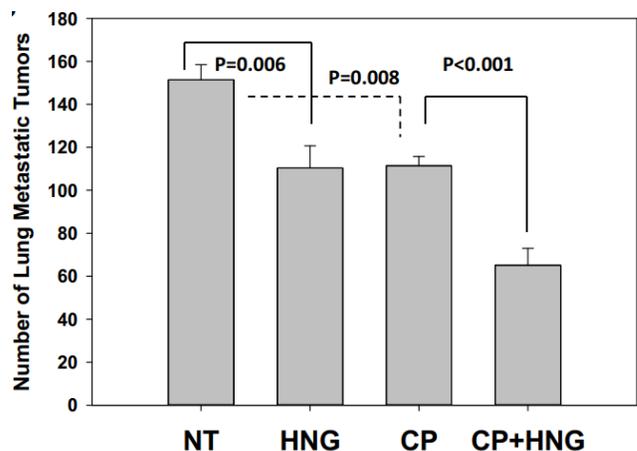
- The CDC estimates that 650,000 cancer patients receive chemotherapy in the U.S. every year.
- Despite the benefit of chemotherapeutic drugs in killing cancer cells and reducing tumor size, **chemotherapy causes apoptosis in testicular germ cells**, which can cause infertility.
- Chemotherapy-induced sterility can result in significant emotional and psychological distress.
- Unfortunately, **there are no available treatments to prevent germ cell apoptosis during chemotherapy** treatment.
- A **co-treatment** that reduces or prevents chemotherapy-induced cytotoxicity in germ cells would greatly benefit patient quality of life.

Innovation

- Dr. Ronald Swerdloff's laboratory has discovered that the **humanin analog HNG protects testicular germ cells from death and/or cell damage caused by chemotherapeutic agents**.
 - Humanin is a 24-amino acid peptide that is well-characterized and known to have cytoprotective, anti-inflammatory, and antioxidative properties in many cell types.
 - **HNG is a synthetic analog of humanin that is significantly more potent.**
- In addition to its cytoprotective properties, Dr. Swerdloff showed that HNG enhances the efficacy of certain chemotherapeutic agents against cancer.
- When provided in combination with chemotherapy, HNG could reduce or perhaps prevent the infertility that is caused by anti-cancer agents.
- *In vivo* testing has been completed in mice.



HNG significantly increased the percentage of seminiferous tubules with germ cells in mice treated with the chemotherapeutic cyclophosphamide (CP). These data support the cytoprotective properties of HNG.



HNG significantly reduced the number of lung metastatic tumors in mice inoculated with melanoma cells. When combined with cyclophosphamide (CP), the number of tumors was reduced even further.

A humanin analog to prevent chemotherapy-induced germ cell apoptosis

[LAB0034]

Advantage

- Protects testicular germ cells from chemotherapy-induced damage
- Increases the efficacy of known chemotherapeutic agents

Applications

- Co-treatment or pre-treatment for patients undergoing chemotherapy to prevent germ cell apoptosis and infertility
- Co-treatment that enhances the efficacy of certain chemotherapeutics

Lead Inventor: Ronald Swerdloff, MD

IP Status

- U.S. Patent No. 9,937,227 issued on April 10, 2018

Related Publications

- Lue Y, Swerdloff R, Wan J, et al. The Potent Humanin Analogue (HNG) Protects Germ Cells and Leucocytes While Enhancing Chemotherapy-Induced Suppression of Cancer Metastases in Male Mice. *Endocrinology*. 2015;156(12):4511-21.
- Jia Y, Ohanyan A, Lue YH, et al. The effects of humanin and its analogues on male germ cell apoptosis induced by chemotherapeutic drugs. *Apoptosis*. 2015;20(4):551-61.
- Jia Y, Lue Y, Swerdloff RS, et al. The humanin analogue (HNG) prevents temozolomide-induced male germ cell apoptosis and other adverse effects in severe combined immuno-deficiency (SCID) mice bearing human medulloblastoma. *Exp Mol Pathol*. 2019;109:42-50.