

Petersen Lab Research Overview

Governor's Economic Development
Conference

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Research Focus of My Laboratory

- DNA Damage
 - Ultraviolet (UV) light induces DNA damage
 - Can lead to mutation → cancer
- DNA Repair
 - Cells have developed methods to repair this DNA damage
 - Work to understand how these repair systems work
 - In humans, a defect in one of the repair systems causes:
 - 1,000-fold increased incidence of skin cancer
 - Mean onset of cancer at age 8 (normally age 58)
 - Reduced life span by approximately 30 years

Chlamydomonas reinhardtii



Why Chlamydomonas?

Direct Application to Humans

- The repair mechanisms used by Chlamydomonas are generally the same as in humans
- We identified a gene that was involved in DNA repair in Chlamydomonas and showed that humans had a similar gene
 - Dr. Belgin Cenkci and Dr. Gary Small
- When mutated in humans, this gene leads to a disease known as Trichothiodystrophy-A
 - Mental and physical retardation
 - Brittle hair/nails
 - Ichthyotic skin (scaly skin)
 - Photosensitivity

Returning to South Dakota

Student Internships

- Benefits
 - Experience and networking for the student
 - Potentially gets them to return to South Dakota for research in the future
- Drawback
 - Productivity suffers

Thank You