As part of Research Experience for Educators (REET), Summer 2016, the primary mission of the project is to expose Advanced Placement Biology students to the field of computer vision by providing them with learning experiences that both advance their knowledge in a specific biological topic while simultaneously integrating conceptual tools and concepts typically encountered in the field of computer vision.

Goals

Teach students biological concepts that explain(s):  
- How low-dose CT scans can provide a non-invasive 3D view of the body, specifically targeted and efficiently detect potentially malignant cancerous tissue.
- Additionally, an annual scanning LDCT may spur unneeded unnecessary biopsies and surgeries. Therefore, the importance of such screening tools is that without LDCT lung cancers may not otherwise be found until a person develops symptoms that require more invasive procedures may in fact be at an earlier stage of cancer and is considered immutable.

A good screening test for lung cancer has been sought for many years, but only in recent years has a study shown that a Low-Dose CT (LDCT) scan can help lower the risk of dying from this disease.


Sample AP Biology Learning Objectives

Using Understanding by Design (UBD) Format

**Essential Questions:** How does a tumor divide in a genetically identical manner? How do the molecular mechanisms of the cell cycle control cell division? How do the control of cell division and normal cell function ensure the survival of the species?

**Learning Goals/Objectives:** "The student will be able to…"

- LO 3.7 The student can make predictions about natural phenomena occurring during the cell cycle. [See SP 6.4]
- LO 3.8 The student can describe the events that occur in the cell cycle. [See SP 1.2]
- LO 3.9 The student is able to construct an explanation, using visual representations or narratives, as to how DNA in chromosomes is transmitted to the next generation via mitosis, or meiosis followed by fertilization. [See SP 6.2]
- LO 3.10 The student is able to represent the connection between meiosis and increased genetic diversity necessary for evolution. [See SP 7.1]
- LO 3.11 The student is able to evaluate evidence provided by data sets to support the claim that heritable information is passed from one generation to another generation through mitosis, or meiosis followed by fertilization. [See SP 5.3]
- LO 3.12 The student is able to construct a representation that connects the process of meiosis to the passage of traits from parent to offspring. [See SP 1.1, 7.2]
- LO 3.13 The student is able to pose questions about ethical, social or medical issues surrounding human genetic disorders. [See SP 3.1]
- LO 3.14 The student is able to apply mathematical routines to determine Mendelian patterns of inheritance provided by data sets. [See SP 2.2]

**Sample Lesson Plans**

**Sample Integration via Weekly Learning Activities**

**References**

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Acknowledgements