

# Molecular Mechanisms of Cancer

## 2022 Annual Video Challenge for High School Students

In a healthy body, cell growth and the cell division cycle are regulated by complex molecular systems. The components of these systems – the molecules and proteins – are arranged into pathways where sequential positive and negative feedback events cause the cell cycle to proceed or stop at the appropriate times. In cancer cells, this feedback system is disrupted and they grow uncontrollably, forming a tumor.

These disruptions are often caused by mutations in genes that encode signaling proteins. These mutated genes then produce mutated proteins that are structurally altered and function improperly within the signaling pathway.

### Important Dates for 2022 Video Challenge

#### Video Submission

January 18 – April 25

#### Judging and Voting

May 3 – May 9

#### Winners Announced

May 17

### The 2022 Challenge

In this video challenge we would like you to explore two specific molecular feedback systems that have an important role in the cell division cycle: the p53/p21 pathway and the EGFR/Ras pathway. Mutations in the TP53 gene (encoding the p53 tumor suppressor protein) are identified in 50% of all cancers, while mutations in the RAS gene (encoding the Ras protein) are identified in 30% of all cancers.

Your task is to create a 2 minute-long video that tells a coherent story explaining the science concepts from one of the topics below and touches on the public health aspects of cancer such as screening, prevention, and awareness.

**TOPIC 1:** Failure of cell-cycle arrest via p21 protein due to mutations in the TP53 tumor suppressor gene.

**TOPIC 2:** Continuous cell proliferation due to mutations in the RAS oncogene in the EGFR/Ras pathway

The learning materials with complete list of requirements for video entries along with participation guide can be found at [pdb101.rcsb.org](http://pdb101.rcsb.org).

### Awards

Qualifying entries will be eligible to win one or more awards:

#### Judge's Award

A panel of expert judges select the top three entries using the following criteria:

- 20% Storytelling
- 30% Quality of Science Communication
- 10% Quality of Public Health Message
- 20% Originality and Creativity
- 10% Quality of Production
- 10% Proper Accreditation

#### Viewer's Choice Award

As voted online.

The winning entries will be recognized on [rcsb.org](http://rcsb.org), and in the RCSB PDB Newsletter.

### News and Updates

To sign up for the monthly newsletter, email [info@rcsb.org](mailto:info@rcsb.org) with the subject *Video Challenge News*.