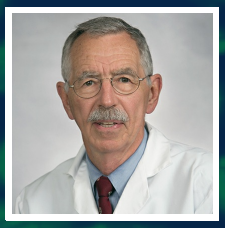
Understanding How Tumors Learn



Stephen Howell

Co-leader, Solid Tumor Therapeutics ProgramDirectorCo-Director

CURRENT RESEARCH

Can we stop tumors from learning how to evade therapy?

While many tumors respond well to initial drug therapy, the majority of them eventually become resistant and start growing again despite continued treatment. Dr. Stephen Howell and his team at the Moores UCSD Cancer Center are applying extraordinarily powerful new molecular and genomic techniques to determine how tumor cells learn to become resistant to drugs. The focus is on what changes occur in the DNA of the tumor cells that render them resistant and the evolution of different clones of malignant cells within the tumor.

Dr. Howell is also using genomic information derived from tumors to develop novel drugs that disable the defense mechanisms that tumor cells use during attack by cancer drugs or the immune system. As part of this effort, he is developing new ways to increase the amount of cancer drugs that actually reach tumors with the goal of overwhelming their resistance mechanisms. This involves producing protein therapeutics capable of attaching themselves to the surface of tumor cells while at the same time avoiding normal cells in the body.

Current projects include:

- Identify resistance genes: The Howell lab is carrying out genomic sequencing of drug resistant tumors to identify all of the mutations that have occurred in the DNA during the development of resistance. The team then uses cell biological techniques to assess which ones are really responsible for the failure of cancer drugs to kill these resistant tumor cells.
- Synthesis and test new drugs: The Howell lab is focusing primarily on the treatment of ovarian cancer. We need better cancer drugs for this disease, and the team's approach to is to develop proteins, polymers and...

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AFFILIATION

University of California, San Diego

EDUCATION

- Fellow in Oncology 1977, Dana Farber Cancer Institute
- Resident in 1975, University of California Hospitals
- Research Associate in 1974, Laboratory of Cell Biology, NCI
- Intern/Resident in 1972, Massachusetts General Hospital
- M.D. in 1970, Harvard Medical School
- and 1 more.

AWARDS

- American Society of Clinical Investigation, 1984
- Milken Family Medical Foundation Award, 1989
- Honorary Doctor of Medicine degree, 1992
- Presidential Citation, 1999

RESEARCH AREAS

Life Science, Oncology / Cancer, Oncology / Cancer, Women's Health

FUNDING REQUEST

Terrific new cancer drugs are becoming available, but tumors learn to become resistant to every one of them! Despite the extraordinary new genetic and genomic tools available to them, Dr. Howell and his team still need the $1M/year to successfully address this challenge which is fundamentally important to the entire field of cancer. There is an urgent need to fund the initial proof-of-principle studies of these novel protein therapeutics and drug-delivery systems that have the potential to disrupt resistance.