

## How Oregon Health & Science University deployed TMC's vibration stabilization technology to advance its research down to the nanometer level



### INDUSTRY

Healthcare Research



### AFFILIATION

Knight Cancer Institute



### FOCUS

Nanobiology of Cancer

## SITUATION

Oregon Health & Science University (OHSU) is Oregon's only public academic health center. As a system of hospitals and clinics, OHSU is an institution of higher learning, with schools of medicine, nursing, pharmacy, dentistry, and public health—and with a network of campuses and partners throughout Oregon. OHSU maintains a diverse collection of medical professionals who come together from all over the world to discover and heal.

“As a staff scientist associated with the OHSU Knight Cancer Institute, I assist with projects dealing with the nanobiology of cancer,” said Dr. Jessica Riesterer. “There’s a big push to look at how cancer cells are organized with their architecture at the cellular level. So we need the highest resolution in order to do that.”

In other words, OHSU researchers must be able to see the full range of features that make up cancer cells and tissues. “The challenge is to make these measurements using technologies that run for days in order to generate the data set we need,” said Professor Emeritus Joe W. Gray, Ph.D.

“Having our microscopes in a stable environment is essential,” said Dr. Claudia López, Associate Professor at the Department of Biomedical Engineering, School of Medicine. “That’s because these instruments are susceptible to vibration, noise, and electromagnetic interference.”

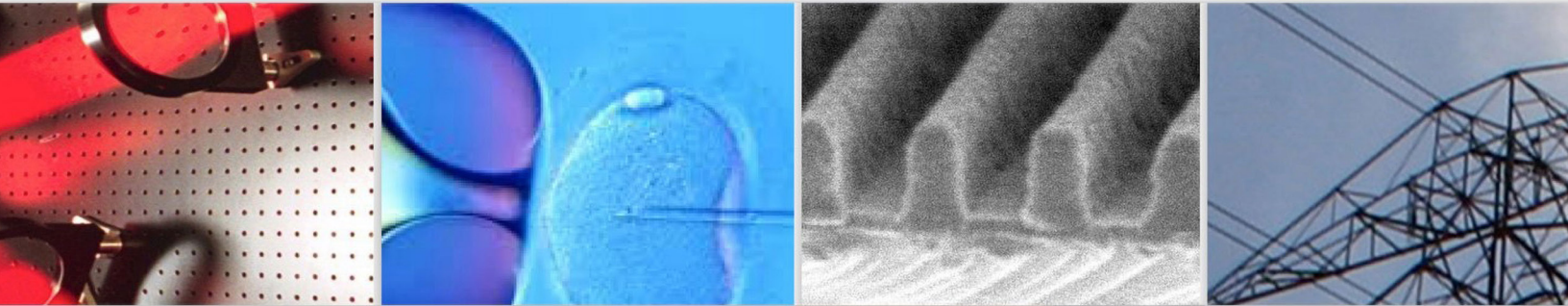
In past measurement efforts, Dr. López was sure that environmental noise and vibration affected the data. That’s mainly because her building is surrounded by light-rail trains, streetcars, and the Willamette River. This circumstance impacts the lab’s imaging efforts. OHSU needed a way to nullify environmental noise and vibration, so it turned to TMC.



**“Today, all of our electron microscopes are installed over TMC tables. This has enhanced our ability to operate these instruments at their highest level of performance.”**

**CLAUDIA S. LÓPEZ, PH.D.**

Research Associate Professor of Biomedical Engineering, School of Medicine  
OREGON HEALTH & SCIENCE UNIVERSITY



## SOLUTION

TMC offers complete environmental solutions designed to provide precision vibration control to enable the most precise measurements—down to the nanometer level.

After assessing OHSU's environment, TMC recommended its STACIS<sup>®</sup> III Active Piezoelectric Cancellation System. Employing advanced inertial vibration sensors, sophisticated control algorithms, and state-of-the-art piezoelectric actuators, STACIS III continuously measures floor activity, then expands and contracts piezoelectric actuators to cancel out vibration from floor motion in real time.

For Dr. Gray, it's been an exciting time. "We have lots to learn, and we have a lot of challenges relating to the interpretation of the data. Now, though, we have the measurement tools we need. I think it's going to be fun to watch how the field evolves."

## BENEFITS

Thanks to STACIS III, researchers at OHSU experience almost no vibration when generating their data sets.

"TMC has helped us mitigate all the vibration that we have in our facility," said Dr. López. "On the TMC tables, we are at zero vibration, which is essential, especially for the high-end instruments that we have in the facility."

Because most vibration has been eliminated, OHSU now gathers more accurate data.

"TMC's vibration control has allowed us to image at the highest resolution," said Dr. López.



Shown is the machine at OHSU that sits on the STACIS III platform.

