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'Smart' nose sniffs out pollution to protect Disney art

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A team of researchers has developed and used a super sensitive artificial "nose," customised specifically to detect pollutants before they could irreversibly damage the Disney artwork on an international tour.

Original drawings and sketches from Walt Disney Animation Studio's more than 90-year-old history -- from Steamboat Willie through Frozen -- travelled internationally for the first time this summer.

This gave conservators the rare opportunity to monitor the artwork with a new state-of-the-art sensor.

Many pollutants that are problematic for human beings are also problematic for works of art. For example, pollutants can spur oxidative damage and acid degradation that, in prints or canvases,

lead to colour changes or decomposition.

"The ability to monitor how much pollution a drawing or painting is exposed to is an important element of art preservation," said Kenneth Suslick from the University of Illinois at Urbana-Champaign.

Works of art are susceptible to damage at far lower pollutant levels than what's considered acceptable for humans.

"Human beings are capable of healing, which, of course, works of art cannot do. Moreover, human beings have finite lifetimes, whereas ideally works of art should last for future generations," explained Suslick.

Suslick had already invented an optoelectronic nose -- an array of dyes that change colour when exposed to various compounds.

To redesign the nose with the aim of protecting artwork, he approached scientists at the non-profit

organisation Getty Conservation Institute (GCI) in Los Angeles.

He proposed that his team devise a sensor several hundred times more sensitive than existing devices used for cultural heritage research. The collaboration took off and the scientists built a keener nose.

Before the exhibit titled "Drawn from Life: The Art of Disney Animation Studios," hit the road on tour, Suslick placed the sensors in discreet places to monitor the pollution levels both inside and outside of the sealed and framed artworks.

If the sensors indicated pollution levels inside the sealed frames were rising, conservators travelling with the Disney exhibit would know to replace the sorbents.

An initial analysis of sensor data showed that the sorbents were effective.

Suslick now expects to continue expanding the sensors' applications in the field of cultural heritage.

The results were shared at the national meeting and exposition of the American Chemical Society (ACS) in San Diego, California, on Sunday.

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