

Plants that save you from volatile organic compounds

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Prof Martina Crole

The Faculty of Veterinary Science's Department of Anatomy and Physiology has taken a simple, but incredibly progressive step towards protecting the health of staff and students by reducing their exposure to human carcinogenic compounds in its dissection halls. Other dissection halls and laboratories in the University of Pretoria (UP) can easily follow these green steps and make their work environments healthier.

Dissection halls are used extensively by veterinary science and veterinary nursing students in their anatomy modules. As in labs, here students gain practical experience. In dissection halls, students get to learn on cadavers of dogs, donkeys and goats. Formaldehyde is one of the compounds used to preserve the dead animals' tissues so that students can conduct anatomical studies on them. Prof Martina Crole, Associate Professor in the Department of Anatomy and Physiology in the Faculty of Veterinary Science, recognises that while it is effective and economical for embalming specimens, extensive research has shown formaldehyde to have adverse health effects. 'Although numerous health and safety measures are in place in our dissection halls at Onderstepoort, there is always formaldehyde in the air when embalmed specimens are in the halls,' says Prof Crole.

Staff and students are exposed to this dangerous compound for as long as they are in the dissection halls and working with the embalmed specimens, and the effects are significant. Prof Crole notes that there have been times when students' eyes have teared up from the formalin (the liquid mixture of formaldehyde gas and water) during dissections, or have had to leave the dissection halls to get some fresh air. Although not experienced all the time or by all people, and dependent upon the concentration, the physical effects of exposure to formaldehyde include watery eyes, a burning sensation in the eyes, nose and throat, coughing, wheezing, nausea and skin irritation.

Long-term exposure to high levels of formaldehyde is proven to cause cancer. Other volatile organic compounds (VOCs) commonly found in certain laboratories, such as chlorine, bromine, xylene and benzene, also have serious health implications.

While conducting an investigation to find simple ways to improve the conditions in dissection halls and reduce exposure to formaldehyde and other VOCs, Prof Crole learnt more about certain air-purifying plants that specifically target the compounds she was trying to eliminate.

The power of air-purifying plants is remarkable and there are a number of plants that are able to remove toxins from the air with varying degrees of effectiveness. Plants belonging to the families Araceae (Arum), Agavaceae (Agave) and Liliaceae (Lily) are all air-purifying plants and are commonly found in garden nurseries. Furthermore, they do not need direct sunlight, so they can live indoors, making them suitable for use in dissection halls and laboratories.



UP has supported this initiative to make the dissection halls healthier and safer by purchasing 20 *Epipremnum aureum* – commonly known as golden pothos, money plant or devil's ivy (because of its hardiness) – which have been placed in the two dissection halls for veterinary anatomy. These are regarded as the best plants for removing formaldehyde from the air. In addition, second-year veterinary science students and first-year veterinary nursing students (whose curricula include modules spent in the dissection halls) will each receive their own small plant, a local South African succulent known as a *Gasteria*, which is also known to remove formaldehyde from the air. 'The idea behind each student having a plant is that they will bring the plant to class and take it home again, thereby increasing the volume of plants during dissections and decreasing the number of plants that UP needs to care for. It is also anticipated that the students will

view this as a positive interaction with a living organism, balancing out the negative effect of dissecting a deceased animal,' explains Prof Crole. In addition to their air-purifying powers, these plants also absorb carbon dioxide and release oxygen, bringing added benefit.

While great strides have been made in this initiative, Prof Crole cannot help imagining the potential for dynamic research that can develop from this. For example, she envisions a collaboration with the Department of Plant and Soil Sciences to quantify the degrees of efficacy of different air-purifying plants to develop guidelines and recommendations for other dissection halls and laboratories at UP, and even outside the University.

But until then, Prof Crole is content that UP has adopted this unique initiative in South Africa for the Faculty of Veterinary Science. It shows that something as simple as introducing specialised indoor plants can make a significant difference in creating a healthier work environment, and the Department of Anatomy and Physiology will continue to colour its dissection halls green.

Prof Crole and her colleagues in the Department of Anatomy and Physiology are grateful to Lawrence Mabona of the Department of Facilities Management, Campus Services Division, who fully supported the initiative.

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