

# How-To-Do-It

## The T-Shirt Test

### *Identifying oneself through smell*

Thomas R. Lord  
Mary Kasprzak

Olfaction has always been a sense that stimulates an interest in teenagers. As students reach adolescence, their awareness of odor in and around the immediate environment rises. Because of the enormous physiologic and psychologic changes they are experiencing through puberty, students become keenly aware that their peers are generating odor. Researchers acknowledge that it is during these adolescent years that the apocrine and sebaceous glands in the dermis of the skin become the most active. This causes a tremendously varied array of liquified aromas to build on the integument's surface. It is during this time that a person's olfactory awareness enters a new dimension.

Amazingly, the scent molecules generated by a person are unique to that person. No one else chemically replicates in his body the exact odors of another. In essence, each human generates a personal label. Animals with a keen olfactory sense can easily identify separate individuals. This is why, for example, a bloodhound can follow the scent of an escaped convict through an environment rich in its own odors. While the sense of smell in humans is not as acute as the hounds', it is sensitive enough for people to recognize their own label. The following exercise is fun to perform, and demonstrates beautifully the keenness of human olfaction.

Before this lab can be conducted, the instructor must obtain at least ten t-shirts. The sizes may vary, but effort must be made to assure that color, design and composition of the t-shirts are identical. To make sure that none of the shirts contains a unique odor, wash all the t-shirts in the same soap or detergent and dry them in an identical fashion several days before the laboratory exercise is to take place.

A day or two before the lab, select students who are willing to wear the

t-shirt next to their skin for a minimum of 24 continuous hours. This group must also promise not to bathe, shower nor use any scent-producing products (i.e., soaps, perfumes, deodorants) for the duration of the experiment. The best results are obtained if the participants can be talked into wearing the shirt continuously for 36 hours, but a 24-hour time period can produce significant outcomes. Just prior to attending the lab, tell the participants to stop by the locker room or bathroom to remove their t-shirts. Upon entering the lab, they should present the shirt to the instructor who should immediately label the shirt with a sticker with the participant's name on it to assure proper identification during collection.

Have the whole class perform a short olfactory related exercise\* to allow the instructor time to separate the retrieved t-shirts into separate clean shopping bags. These bags should have no individual markings, but should be identified by a number or letter written on the bag's bottom. The instructor must write the number or letter of the bag into which a student's t-shirt is placed on the identification sticker of the shirt. This sticker is then removed and placed on a clipboard with the other participants' stickers, also so marked. An alternative procedure is to place the participant's sticker onto the bottom of the bag into which his shirt was placed, but if this alternative is selected, additional care must be taken during the lab to assure that students do not see the stickers.

Place the labeled bags in random fashion together on a demonstration counter in the room, and summon participants to the counter separately. Ask them to identify, using only the sense of smell, the t-shirts they had worn the previous 24 hours. It is important for the instructor to tell the subjects it is okay to lift the shirt from the bag in a ball, but not to straighten it out and hold it up. This will elimi-

\* An ideal exercise for this segment is to have students find their own olfactory threshold for a particular common scent (i.e., vanilla, pickles) that has been previously diluted in serial fashion.



Figure 1. Student receives a shirt for the t-shirt test.

nate the various sizes of the t-shirts influencing the students' decisions.

Participants should not be hurried. Some will want to smell each shirt individually before making a decision, while others will stop the task when they come to the shirt they feel was theirs. The instructor should record the student's decision, but success or failure of the choice should be withheld until all of the subjects have gone through the procedures. It is also very important for the instructor to scramble the order of the shopping bags after each participant's decision. This will eliminate the influence of one student's choice on another student's decision. When all the participants have made their decisions, the results of the lab should be revealed. The success of the students on this task is generally very good, often resulting in most of the students correctly identifying their t-shirts.

The lab supports the claim that humans do indeed generate subtle odors that are unique to the individual. It is also indicates that the sense of smell in humans is sensitive and accurate enough to recognize its owner's label. This lab is fun, and will tend to generate enthusiasm in the class. It will also enhance the study of one of humankind's most primitive and least understood senses.

## References

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Figure 2. Student wears the t-shirt for 24 hours.



Figure 3. Student puts the shirt into a plain paper bag.



Figure 4. Student attempts to identify her own t-shirt by smell.

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**Thomas R. Lord** is a professor of biology at Burlington County College, Pemberton, NJ 08068. He has taught life sciences at both secondary and collegiate institutions for more than two decades. Presently on a one-year sabbatical, Lord is a postdoctoral fellow with the Dept. of Higher Education in New Jersey. He has published more than a dozen articles in professional journals and is the past president of the N.J. Consortium of Community College Biologists. **Mary Kasprzak** is a biology major and a student researcher at Burlington County College. Upon graduation, she plans to transfer to Rutgers Univ. to complete her studies in bioengineering and hopes to continue her research in human olfaction.