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Active Voice: Research on "Exercise Pill" Raises Many Questions

By James S. Skinner, Ph.D., FACSM

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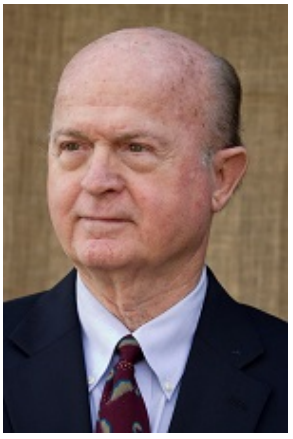

James S. Skinner, Ph.D., FACSM is a professor emeritus in the Department of Kinesiology, Indiana University. He is a former president of the American College of Sports Medicine and chair of the International Advisory Council for Exercise is Medicine. He was one of the five principal investigators of the HERITAGE Family Study, a large multi-center investigation of the role that genetic factors play in the response to training relative to risk factors for cardiovascular disease and diabetes. As principal investigator, co-principal investigator or member of an executive committee, he has been involved in research grants totaling more than $50 million. He received the 2014 Honor Award from the American College of Sports Medicine. In 2011, he received a Doctor Honoris Causa from Semmelweis University in Budapest, Hungary. Dr. Skinner has published over 290 articles, six books and 19 educational DVDs. He has been actively investigating the relationships between exercise, training and health for more than 50 years and has lectured in English, French, German and Spanish in 60 countries about these relationships.

In this Active Voice, Dr. Skinner communicates his views on a report by Ariana Eunjung Cha and Brady Dennis that recently appeared in The Washington Post. *Cha and Dennis had entitled their story Scientists create blueprint for developing exercise in a bottle drug that promises to transform your workout. To ensure proper balance in the media coverage of these research findings, ACSM asked Dr. Skinner to provide a response based on his expertise. The original text of Dr. Skinners statement, with minimal modifications, was first published yesterday as an opinion piece in a prominent online and print news source in Washington, DC, called THE HILL. THE HILL is a nonpartisan source, covering politics, business, information of social interest and more.*

As often happens in health science, research asks more questions than it answers because the body and its reactions are so complex. Recognizing that news articles sometimes end up with headlines that go well beyond the points and implications of scientific studies, and even the intentions of reporters, here are some questions I had after reading this story.

In one of the research articles cited in this news report, the scientists wrote that exercise results in a cascading series of more than 1,000 molecular changes, but any one pill would affect only a few variables. Does this mean that one would have to take hundreds of pills to get all or most of the beneficial effects of exercise?

The human body is a complex framework of interconnected and integrated systems, especially when it responds to exercise and adapts to training. There are many types of exercise. Consider the differences with lifting a heavy weight for a few seconds, sprinting for 1-2 minutes, walking for 30 minutes and jogging for several hours. With different durations and intensities of exercise, different responses are needed. Would one need different pills for each type of exercise? There are many more related questions. For example, the body tries to adapt to the effects of repeated exercise. We call this the training effect. To get the many benefits of exercise, it must be done regularly. Would one have to take the pills regularly?

If a system of the body functions adequately, little or no adaptation is needed. Consider the example of blood sugar. If it is high, the person would be diagnosed as having type 2 diabetes. We know that regular exercise helps to control blood sugar by many different pathways, including weight loss and insulin sensitivity. Would one have to take different pills for each desired adaptation to mimic the effects of exercise? Consider what happens if the blood sugar is normal. There is no need to adapt, but exercise would help to keep it normal. Would one need to take the same or a different pill to keep it normal?

Lets assume that after a few decades of remarkable scientific advances, several pills could be developed that

mimicked just a few of the many therapeutic benefits of regular exercise. Such drugs would have to go through clinical trials to make sure that they were effective, did not have bad side effects and were safe over a long period of time. As a result of the costs to conduct these trials, each of these pills would be very expensive.

One of the two scientific papers cited by Cha and Dennis is a review of previous research, rather than a report of an original study. One reason the co-author of that review article gave for studying pills that mimic exercise was that compliance to exercise programs is low. What he did not mention was that compliance to taking prescribed medicines also is quite low. What would compliance be if one has to take hundreds of expensive pills just to avoid having to exercise? Lets further speculate that we have a medicine that is inexpensive, cost-effective, has few negative side effects and is able to prevent or treat dozens of diseases and improve ones quality of life? Would you take it? Well, guess what? We already have that medicine and it is universally available! It is called exercise, and there is no simple way to mimic its effects with a pill.

Readers might think that I oppose research on chemicals that might mimic the effects of exercise. Not true. The research central to the Cha and Dennis story is, in fact, very important because it gives scientists insight on how the body works, especially during exercise. As a result, researchers might be able to improve the beneficial therapeutic effects of exercise to treat and prevent many of the diseases associated with our lifestyle, including obesity, type 2 diabetes, cardiovascular diseases, and cancer. All of this will improve the health of our aging population.

In closing, I want readers to realize that taking one or a number of expensive exercise pills, no matter how unlikely or far into the future that may be, will probably not bring about the same beneficial effects of exercise. The key is to find one or more types of exercise that you like to do, and do them regularly.

Editorial Note: ACSMs leadership strategies include proactive steps that encourage dissemination of accurate information in the public media, regarding advances in exercise science and sports medicine. Such activity is integral not only to the ACSM mission, but also to building credibility with the public about the meaning and relevance of new research findings and clinical practices. Dr. Skinners opinion piece in THE HILL is consistent with and supports this ACSM media advocacy strategy. It also presents an opportunity for ACSM members and affiliates to be part of the strategy. To that end, please consider sharing key facts and points with media professionals, colleagues, students, clients and the general public in your local communities.