

THE AUTHOR FILE

William Ja

Lessons from the volleyball court help to compare ways to measure how much flies eat.

Carb-lover diet, caveman diet, thin forever diet—it is easy to disagree about nutrition in humans or model

organisms. Although there is plenty of invertebrate research on nutrition and aging, too many researchers ignore what fruit flies eat because it is hard to measure, says William Ja, a chemist turned biologist in the metabolism and aging department at The Scripps Research Institute campus in Jupiter, Florida.

Giving one group of fruit flies a high-protein diet and another group a high-sugar diet might indicate which nutritional habits shorten lives. However, precise measurements may reveal that the animals are eating only a little of the high-protein diet and that both groups are actually ingesting the same protein amounts. “These measurements matter,” he says.

In this issue of *Nature Methods*, Ja and his team compare food intake assays for fruit flies, which can help researchers study genetic and neuronal aspects of behavior and metabolism.

In his view, using radioactively labeled food or a capillary feeder, a technique he co-developed in which flies drink from a straw and volume displacement is measured, is better for determining food intake differences. Other approaches such as food dyes or counting how many times flies extend their proboscises are less precise, he says. Ja hopes that researchers planning experiments will consider each approach’s strengths and weaknesses.

Since 2010, Ja has been building his lab as a principal investigator, and he has just received his first R01 grant from the US National Institutes of Health to look at genetic and epigenetic influences on metabolism and aging in fruit flies. “I love what we do, and I have so much fun doing it that I’m always surprised we can get money for it,” he says.

Ja completed his PhD in chemistry at the California Institute of Technology (Caltech). He switched to biology as a postdoctoral fellow in the lab of Seymour Benzer, also at Caltech. “I cherished every moment I had while I had him as a mentor,” Ja says of Benzer, who passed away in 2007.



Michelle Tittl

William Ja with Tarka

Moving from chemistry to biology means exposure to different types of data. A chemical synthesis with an 80% yield will likely deliver the same yield when it is repeated, he says. A scientist might measure the lifespan of 500 flies and get “beautiful statistics” on median, mean and maximum lifespan under controlled temperature, humidity and light. “But you repeat that experiment the next month and the numbers can change quite a bit,” says Ja. “Biology, and life in general, is noisy.”

Whether researchers stay with a field or a technique or decide to shift, he advises colleagues to follow their passion, not fads. “If reading about a new grant inspires you to connect your work to whatever that grant topic is, that’s great.” But if the new grant is the only reason to try something new, “that seems wrong.”

When fruit fly biologist Ulrike Heberlein set up the capillary-based fly-feeding assay in her lab, Ja was “tremendously generous,” she says. Heberlein manages science strategy research at the Janelia Farm Research Campus, where she runs her own lab and directs recruitment, graduate researcher and visiting researcher programs. “He never got tired of us bugging him with question after question,” she says. She likes his approach to science, with “simple and elegant assays” to pursue complex and important biological questions.

When not in the lab, Ja plays the piano, his tunes spanning modern to classical to musicals. He teaches himself movie soundtracks from films he likes, especially those with a piano in a leading role such as in *The Piano*, *Amélie* or *The Legend of 1900*.

Ja is an avid volleyball player, and he has coached high school and college volleyball in both California and Florida. Because of time constraints, he has had to give up coaching, but working with players, he says, has helped prepare him to run a lab. The lessons from coaching include how to build a team and motivate players to push hard for a few more points but not to push so hard they give up. Some players need constant attention or praise; others do better with “tough love.”

Both as a coach and as a teacher, “you have to be adaptable,” Ja says. Research mentors might stick with one mode of working with people. But one size does not fit all. “It’s probably something every good school teacher already knows, but I had to learn it myself.”

Vivien Marx

“Biology, and life in general, is noisy.”

Deshpande, S.A. *et al.* Quantifying *Drosophila* food intake: comparative analysis of current methodology. *Nat. Methods* **11**, 535–540 (2014).