

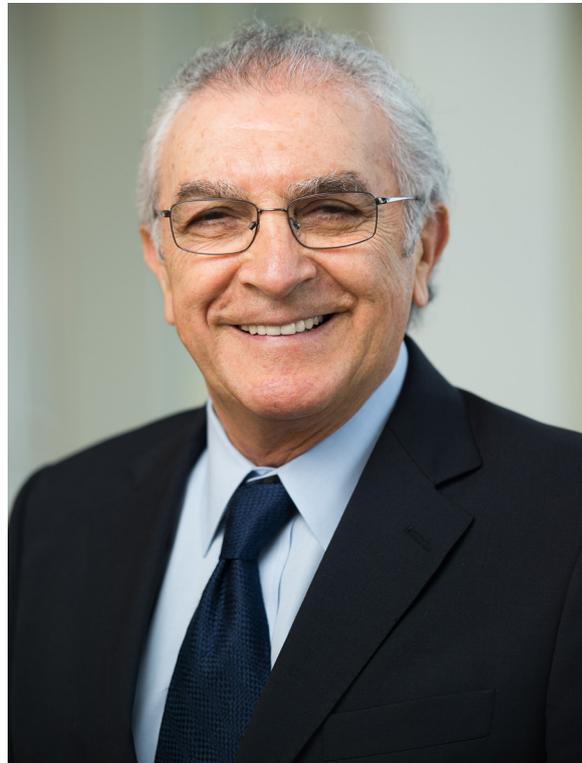
José Jalife Perseverance Pays Off

Ruth Williams

José Jalife is unquestionably one of the world's leading experts in the field of cardiac electrophysiology. Indeed, in addition to having written more than 300 scientific papers and edited numerous books on the subject, he is a coauthor of the internationally acclaimed textbook *Cardiac Electrophysiology: From Cell to Bedside*, now in its seventh edition.

His research has covered all areas of physiological and disease-associated cardiac electrical activity, including mathematical modeling of heart rhythms, determining the molecular and cellular mechanisms of conduction, and defining diagnostic criteria for complex arrhythmias.¹⁻⁷ It's safe to say that Jalife, who is currently the codirector of the Center for Arrhythmia Research at the University of Michigan, knows more than most about the heart's regular rhythms, as well as the disordered beats that signal disease and death.

Jalife spoke to *Circulation Research* about how he came to fall in love with the heart, with scientific research in general, and also with his lovely wife, Paloma. Not once, he says, has he ever wavered from his passions.



José Jalife

Tell Me About Your Upbringing

I grew up in Mexico City. I am the child of Syrian Jews who migrated to Mexico in the early part of the 20th century to escape persecution. My parents arrived in Mexico independently but then met and married and had three children. I was the youngest. My mother worked at home, and my father had a business buying and selling textiles. Although their own level of education, like most Syrian immigrants, was not great, my parents were very enthusiastic about educating their children. I was the first physician ever in the family.

How Did Your Interest in Science and Medicine Begin?

I always wanted to be a doctor, ever since I was a child. When I was a very little boy, the family physician would make home visits and I would see him with his stethoscope and other equipment and I was fascinated. I would play at being a doctor. As I got older, biology became a favorite subject at school.

But then, when I entered medical school, I discovered research for the first time. I realized that medicine wasn't just about caring

for patients but also about discovery. One of my professors, Emilio Kabela, was a researcher, and he invited me to join his laboratory in the pharmacology department at the National Institute of Cardiology in Mexico City. The department was run by the very illustrious and highly respected Spanish pharmacologist Raphael Méndez.

So, starting in my second year of medical school, I began my own experiments in Méndez's department. I became so enamored with research that I was working as a volunteer in the afternoons and evenings at the laboratory while going to medical school in the morning. It was a very intense, but wonderful part of my life, and it solidified my desire to become a scientist.

I remember working on a Starling heart and lung preparation, where the heart is beating and pumping blood through an extracorporeal circulation. It was amazing to be looking at the heart directly and seeing it function, analyzing its contractions, performing electrophysiology. It inspired my future career.

Why Did You Choose Spain for Your Medical Internship?

We had a choice of several countries for our intern training. I had originally selected Britain because a lot of what was known about heart physiology at that time was based on work by famous British cardiologists—including Starling. But three of my friends wanted to go to Spain, and they lured me to go with them. They said, listen, we'll go to Spain, we'll buy a car, travel through Europe, meet girls, and have a good time. So I went to Spain for a year, and while I was there I got married.

Wait. What?

I was working in a hospital in the town of Oviedo in Asturias, Northern Spain, and I first saw Paloma, who was working as a biochemist, in the hospital's cafeteria. Then later, I met her in the town and since then we've always been together. Originally, I was going to go traveling with my friends, but the moment I met my wife, I focused on her and on my work and the rest is history.

We went back to Mexico together, where I worked as an instructor of second-year medical students combining teaching with work in the laboratory, and then I was offered a postdoctoral fellowship in Syracuse, New York.

What Was the Appeal of America?

When I was in medical school, I met a wonderful scientist whose name was Gordon Moe. He was a very good friend of Rafael Méndez and would come to visit often. From very early on I wanted to work with him, but when I was ready for a postdoc, he did not have an opening for me. He was based in Utica, New York at the Masonic Medical Research Laboratory. And, after my second year at Syracuse, he offered me a position, so I joined him as a senior postdoc and spent five years with him.

I had to wait two years to start work in his lab, but it was worth it. My time there is when I really decided to spend my life doing research. He was an incredible mentor, and I just wanted to be like him.

What Was Moe's Research Philosophy and How Did It Shape Your Own?

I learned so much from him, not only about science but about life. He was a socially conservative republican and the most open person with regards to people. I was a Jewish Mexican married to a Spaniard, so a bit of a mongrel, but he took me under his wing like a son and I became a mature human being thanks to his teachings. He was a wonderful man.

He was also incredibly open-minded toward science and he taught me to think that way.

He had a very special approach to science. He would call all of the postdocs and junior faculty into his office at 5 PM and he would retrieve, from his little refrigerator, a bottle of bourbon. We would sit and drink our small shots of straight bourbon and, for an hour, just talk about science, about our experiments, about new ideas. Those were the lab meetings, which happened every day of the week from Monday to Friday, and after that break, we would go back to the laboratory to continue our experiments.

I would be in the lab until 1 or 2 o'clock in the morning doing experiments, my wife at my side knitting, after having brought in dinner. At that time, she wasn't legally allowed to work. It was hard work, but it went so fast, and it was great fun. I was playing while learning. I was really enjoying what I was doing. It was the best five years of my life. In 1979, thanks to the work I completed with Gordon, I was awarded the Young Investigator Award by The American College of Cardiology. Many more awards followed, but that first one affirmed my scientific career. It was very special.

What Other Proud Career Moments Have You Had?

One would be when I experimentally proved a mathematical model of parasystole that we had developed—we called it modulated parasystole. I was able to recapitulate, using cultured canine heart tissue, the predictions of the model, which described electrical competition between the normal pacemaker of the heart and an ectopic pacemaker.

Another would be my hypothesis that the pacing of the heart is essentially based on thousands of cells that synchronize their activity democratically. The slower cells slow down the faster ones, the faster cells accelerate the slower ones, and the rhythm is somewhere between. I was able to test that theory in cultured

heart tissue, and low and behold I demonstrated a very similar behavior.

And What About Your Biggest Challenges?

The biggest challenges for scientists nowadays are financial. I spend most of my time writing grant proposals and doing administration of the laboratory and that's a challenge that nobody likes. It's not unique to me.

But aside from that, I cannot think of any given moments in which there was an experiment that was so bad that I had to abandon the idea completely. I always came back to the idea and eventually some success came out of it. The nice thing about science is that, if you're faced with an obstacle, you can move in different directions and ask different questions. New questions always arise. I cannot think of a moment of depression or discouragement where I thought, no, this is not going to work, and abandoned it. We simply tried something else to go around the problem.

As an example, when I was developing the idea of the democratic process of the sinus node—the synchronizing of the heart cells—I presented my work at a meeting of the American Heart Association and I remember that one of the best known scientists at the time came up to me and said, "Why are you working on this? Why don't you work on calcium?" And I said, "No, I think this is important."

So, even though people were discouraging me from continuing my work, I carried on and I was not put off.

Perseverance is a very important aspect of research. For me, abandoning an experiment prematurely is not a good idea.

You Don't Seem to Get Discouraged Easily

I think that describes me well. I don't get discouraged. I just keep going.

Do You Have Advice for Young Scientists?

Do not give up. It is really tough and you have to work very hard to succeed, but in the end, when you see your paper published and you have worked on it with all your soul and all your heart and all the knowledge that you have, there's no better reward. It makes you forget any failures you had.

Secondly, read a lot. Know the literature. Gordon Moe always said, "It's fine to do an experiment and have the joy of discovery, but if you go to the literature and find someone already did it, that joy disappears."

Also, you must be honest with yourself—that's the most important thing. If a scientist is not honest with himself, he is not going to be honest with the rest of the world. Science has to be the most honest endeavor that anyone undertakes. It is all about discovery and increasing knowledge and that can only be done when you interpret things in your mind in the most honest way.

Unfortunately, there can be a lot of pressure on scientists and a lot of competition, and sometimes a person can lose their honesty in an effort to succeed and that is a terrible thing.

Aside From Dishonesty, What Other Mistakes Should Researchers Avoid?

Many times, young scientists want to make their mentors happy and one has to be very careful about that because your mind can fool you into thinking that the experiment you are doing is the right one, or the way you are interpreting the results is right when really it's not. It is not your job to get the result your mentor is hoping for, but to get the result that is right.

What Qualities Are Necessary for Success in Science?

You have to be aggressive, perseverant, honest, prudent, a good communicator, and to overcome fear.

What About Being Hard Working? How Important Is That?

Naturally, it's very important. When I was young, I worked very, very hard. Nowadays, I generally come to work at 8:30 AM or 9:00 AM and stay in the lab until 7 PM. Sometimes I continue for a couple of hours at home after dinner, and I spend maybe 4 or 5 hours working on Saturdays and Sundays. That is, if I'm not traveling to New York City to listen to some opera. Paloma and I are opera lovers and have subscriptions to the Metropolitan Opera.

I'm 71 years old now, and my wife says, "let's go to Spain and retire." I say, "yes let's go to Spain, but I won't retire." I don't golf, I don't play tennis; I like music and I like traveling, but research is what I enjoy best. So I'm going to continue doing what I like the most, first in Michigan and then at the National Center for Cardiovascular Research in Madrid.

I hope the work I have done and my contributions to science will have an impact after I die. However, what I consider most important is that at least I tried my best and gave it my all. For me, that's a great accomplishment.

Disclosures

None.

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