Q: Would you tell us about the research program in which you are using the BD Accuri™ C6 flow cytometer?

Dr. Palomares: One of our research goals is to make different populations of cardiomyocytes from human embryonic stem cells. We have optimized the protocols, but they’re sometimes hit-or-miss, and we can’t gauge whether we’re actually going to make efficient cardiomyocytes. The cells won’t start beating until day 8–10 of differentiation. Even an actual marker of cardiomyocytes, like troponin, doesn’t usually appear until day 5–8 of differentiation. We would like to stain the cells even earlier and gauge whether our cardiomyocyte differentiations are going well. If not, it’s better to just throw away the differentiation and start a new one. These are expensive cultures, so you don’t want to carry something until day 20 and then have it not work out.

For my part, I’m trying to figure out a cell surface phenotype for cardiac progenitors. I’ve been staining for Islet-1 (ISL1), and I was able to do a time course from day 0 through day 20 of differentiation, harvesting and staining cells every day. With the machine in our lab, it’s easy to do that; otherwise we’d have to go to a core facility. It’s nice that even before the cells start beating, you can take a sample, quickly stain and run it on the machine, and gauge whether the numbers look promising.

Q: Why is finding a cell surface phenotype important?

Dr. Palomares: The key thing is to be able to sort these cells and expand them. With the cardiac progenitor, I’m trying to find something that can be expanded at least for a few passages, like neural stem cells. And later you can freeze them down, or keep on propagating them and differentiating them further.

Islet-expressing cells are thought to be progenitor cells, but like troponin, ISL1 is an intracellular marker, and staining destroys the cells for further study. So we have our intracellular marker that we know is expressed on cardiac progenitors, and now we’re trying to find the cell surface phenotype, which will allow us to sort and expand the cells.

I ran a screen using the BD Lyoplate™ Human Cell Surface Marker Screening Panel (Cat. No. 560747) to identify potential surface markers. For that, I used a BD FACSCan™ flow cytometer with a 384-well plate reader. Still, it was nice having the BD Accuri C6 to make sure that I was seeing the right stain before I ran the whole screen on all 384 wells.

Q: Have you been successful in finding surface markers for your cardiac progenitors?

Dr. Palomares: Yes, we did get a few hits—both positive and negative markers. I can’t reveal them yet, since it’s a hot topic right now. I wanted to find something that was troponin-negative but Islet-positive. Right now I’m validating the hits on the BD Accuri C6.

Q: What features of the BD Accuri C6 are important to you?

Dr. Palomares: It’s small, it sits on our bench, and it can analyze all the basic colors of the antibodies we want. It’s very convenient to have in the lab. And it resolves the populations really well.

Q: Did anything surprise you about it when you first got your hands on it?

Dr. Palomares: It’s easy to use. For example, you don’t have to adjust the voltages.
I’ve been using the machine to teach the other postdoc in my lab how to do flow cytometry, and I think it’s the best machine for that. I wish I had started on that machine! The software is very user friendly. Everything is on that first page. When you’re collecting your samples, it’s easy to follow, easy to find the next step of what to do.

I’m also surprised at how such a small machine can provide such consistently nice data. The resolution is great.

Q: What does BD Accuri’s motto, “Flow Cytometry Within Reach™,” mean to you?

Dr. Palomares: Within reach—that’s exactly what it is. With the machine in our lab, I can easily monitor my differentiations. I can take one well and quickly gauge whether it’s going to go well or not. It’s helping me make progress. If I see at an earlier time point that a certain marker isn’t expressed, then I can easily start a new experiment instead of waiting for a longer time. I just like having the machine accessible. I’m very happy that I have it.