

## Q&A: A conversation about goals and challenges

**P**ersonalized medicine refers to companies that are inventing ways to predict, prevent and treat disease tailored to specific groups of people. Companies like 23andMe, which has a test that can sequence a person's entire genome and give them information on diseases they may be susceptible to for about \$500, and Genomic Health, which has a test that can help predict how effective chemotherapy will be in treating breast cancer, are getting a lot of attention. Down the road, some people envision discoveries in personalized medicine leading to personalized cancer vaccines.

The team at CMEA Capital, a San Francisco venture capital firm, has explored investing in personalized medicine companies for the past six years but has only made a few investments. While they say they ultimately always agree on the firm's decision whether or not to invest in a company, managing directors David Collier and Karl Handelsman disagree on whether all of the hype about personalized medicine is justified.

### Q. What is personalized medicine?

**Collier:** I think personalized medicine is a concept that is just the same thing as diagnostics, which is an area that people

have been investing in and developing products in for a long time. I think personalized medicine is just a new name for the same thing that has been around forever.

### Q. What do you find compelling in it?

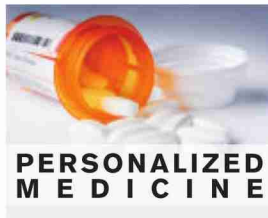
**Handelsman:** There are a lot of different categories. Genomic tourism companies like 23andMe, which just closed \$30 million in financing, is a non-reimbursed thing people can do just for fun — of

looking at their genomic makeup and comparing it to other information online. You can delve into rare types of mutations or types of common mutations and learn a little more about what your genomic makeup is and how it fits into health care

or migration of humans over the last thousand years. I think that's an interesting subset of the market.

### Q. And what's compelling about the space in terms of investment potential?

**Handelsman:** One of the things that's compelling is because it's a consumer product, ... you can leverage existing technology platforms that exist for other reasons like Ancestry.com and other groups. The cost of doing this is going



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to become less and less over time and the number of new discoveries is going to increase. I think it can empower even knowledgeable people to take their health in a more positive direction.

**Collier:** We've looked at a lot of these companies over the last five to six years and have not invested in them. Genetic tourism is sort of an unproven business model at this point. Today, the cost of doing genotyping is way too high. That needs to drop several orders of magnitude probably to get to a point where a lot of people are going to be willing to pay x dollars to delve into their genome and look for this sort of information. That's really the issue: How much customer demand is there at the end of the day and at what price point? If the cost of the test is \$1,000 and does a little bit of genotyping, that's a small market. If the cost is \$10 and it sequences your entire genome, then I think there's a lot more people who would sign up for it.

**Q. If it was \$10, wouldn't everyone sequence their genome?**

**Collier:** The risk of doing any sort of testing is you may find something that may lead to an invasive and dangerous workup that may just have been a false signal to begin with. There is always a downside to testing that people don't think about.

**Could the benefits of testing outweigh those risks?**

**Handelsman:** It depends on what you find out. Let's take the worst-case scenario. You find out you have a genetic disposition for a disease you'll have later in your life for which there's no cure and no treatment. If you worry about that and it makes you miserable, that's not good. But what it might do is give you a stake in supporting research that actually might (study this problem). I think it would let people know they have more than an altruistic stake in it.

**Q. What's the biggest risk factor for personalized medicine companies that are trying to court investment?**

**Collier:** The biggest risk factor for Genomic Health-type companies is the future of FDA regulation of that area. They started out in a freewheeling Wild West atmosphere where it was unregulated by FDA. And the FDA now is justifiably saying these are companies that are driving important medical decisions and they should be regulated by the FDA. They are, in usual governmental fashion, slowly grinding along in terms of how to regulate them. And that's a cloud of uncertainty hanging over the whole industry that really hasn't been resolved yet.

**Q. Does it temper your enthusiasm for potentially investing in these types of companies, that the FDA is involved and slowing the pace of a lot of these companies?**

**Handelsman:** So one of the things the FDA mediates is the amount of risk that is acceptable to the American public. They've decided the American public doesn't want any risk. I think they've gone so far in the safety direction that

it inhibits all new investment, not only by venture capitalists but by pharmaceutical companies with billion-dollar research budgets.

**Q. Is 23andMe a success story? Or is it still to soon to tell?**

**Collier:** It's still unproven.

**Handelsman:** Although it's a success that they raised that round because that allows them to run the experiment and hopefully prove out that particular model. But whether they prove it or not, there's a lot of basic research bubbling up. There will be a lot of progress going on, and from time to time there will be a business proposition worth taking a bet on and some of those will prove out.

**Q. What's your sense of the hype surrounding personalized medicine?**

**Collier:** What I see going on in personalized medicine is a lot of over-hyping of this whole concept and I think it's a real disservice to the public. You've got scientists and investors and companies running around touting this fantasy that we're going to be able to know exactly the right drug at exactly the right dose for every patient and we're going to tailor every therapy on an individualized level for every genome for every person. That there's no reason anybody should ever get the same dose of a drug. That whole concept is utter hogwash. To tailor a therapy for any person or any classification of people, the only way you can actually do that is run a clinical trial where you measure one therapy against another therapy, one drug against another, one dose against another dose. Unless you've got 10k clones of you running around that we can test a bunch of different drugs and doses on, there isn't a way to actually know which drug is right for you.

**Handelsman:** We're already now doing some tests in, for example, oncology. A lot of time we're testing to see if there are markets there. That's going on every day.

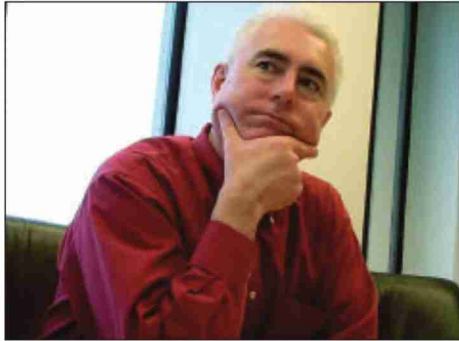
**Collier:** That ultimately is the same thing as taking someone's blood pressure and deciding if they have high blood pressure or not and giving them a drug. This whole concept isn't anything new. It's exactly what we've been doing forever.

**Q. It seems like there is a human angle to personalized medicine that regardless of whether these tests can be accurate and cost-effective, if they work, somebody gets to live longer. Is that a factor in investing?**

**Handelsman:** The good news about the stuff we invest in is we're only interested in investing in things that have a huge impact and can make a lot of money. We need a very strong business case and that can't be based on some marginal wishful thinking of someone somewhere.

— Lindsay Riddell ■

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**David Collier** (left) and **Karl Handelsman** review investment opportunities in personalized medicine but don't entirely agree on whether the hype is justified.