



Ralph E. "Chris" Christoffersen PhD is a partner at Morgenthaler Private Equity. He currently serves on the corporate boards for seven life science

companies and has achieved successful exits with numerous others. Previously, he was the president and CEO of Ribozyme Pharmaceuticals Inc., and has served as senior vice president of research at SmithKline Beecham, vice president of discovery research at The Upjohn Company, and president of Colorado State University.



Larry Gold PhD is the founder, chairman of the board, and CEO of SomaLogic. He founded NeXagen, which became NeXstar Pharmaceuticals

and later merged with Gilead Sciences Inc.; and was a co-founder of Synergen, which was acquired by Amgen. He is also a professor at the University of Colorado at Boulder and served as the chairman of the Molecular, Cellular and Developmental Biology Department there. Gold serves on the boards of numerous bioscience companies and is a member of the American Academy of Arts and Sciences and the National Academy of Sciences.



Kyle Lefkoff is a founder and general partner of Boulder Ventures Ltd. In the course of his 26-year career as a venture capitalist, Lefkoff has

invested in 60 Colorado companies, resulting in twelve IPOs and fifteen trade sales.



Patrick Mahaffy is the president and chief executive officer and a co-founder of Clovis Oncology. He previously founded Pharmion Corporation,

which was acquired by Celgene Corporation, and also served as president and CEO of NeXagen and its successor, NeXstar Pharmaceuticals. Mahaffy was formerly a vice president at the private equity firm E.M. Warburg Pincus and Co. He serves on the boards of several bioscience companies and is a trustee of Lewis and Clark College.

THE NEXT 10 YEARS: PEERING INTO BIOSCIENCE'S CRYSTAL BALL

BY JEANNE MCADARA-BERKOWITZ, PHD



With 10 years under the Colorado Bioscience Association's belt, it's a natural time to look back at our accomplishments and forward into the future. We asked four Colorado bioscience industry veterans—Ralph "Chris" Christoffersen of Morgenthaler Private Equity, Larry Gold of SomaLogic, Kyle Lefkoff of Boulder Ventures, and Patrick Mahaffy of Clovis Oncology—for their perspectives on what we should watch for in the decade to come.

CAN YOU OFFER ANY PREDICTIONS ABOUT THE SCIENTIFIC PROBLEMS COLORADO'S BIOSCIENCE COMMUNITY IS POISED TO OVERCOME IN THE NEXT 10 YEARS?

With a reluctance likely born from experience, Gold and Mahaffy both demurred. Perhaps they have seen too many predictions that missed the most significant breakthroughs or, conversely, overstated the promise of a product that ultimately never made it

“We’re also going to see more and more integration between basic research and commercial companies. Academics are reaching toward health applications in ways that represent big changes from when I started in science.”

to market. “There are many exciting developments happening in Colorado, but it’s impossible to predict what might come out of our universities or companies, and which ones will be successful,” says Mahaffy. Adds Gold, “No one knows what’s really coming...there’s just no way to know.”

Lefkoff and Christoffersen were more willing to speculate.

“With the caveat that I am focused pretty exclusively on bioscience here in the Boulder area,” says Lefkoff, “I think we have three areas of excellence that distinguish us from biotechnology clusters in the rest of the US.”

“Number one,” he says, “has been the opening of the Jennie Smoly Caruthers Biotechnology Building at CU, which houses the BioFrontiers Institute. Now we have an integrated center for biotechnology that brings together disparate parts of the campus all in one place. CU has always been a rich mine of technology and I think this will help the University in its long-term efforts to translate that resource into commercial ventures.”

“Number two is the chemistry expertise concentrated here,” Lefkoff continued. “Chemistry-focused bioscience companies are going to be increasingly important in the future because people have worked out much of the biology behind cancer and cardiovascular disease. If we have a target, the next step is to work out the chemistry. Pharmaceutical companies want a Lipitor®, not a Baycol, and to get there takes world-

class expertise in chemistry, which we have.”

“Third, CU is dominant in RNA biology and chemistry. In the next decade, we’re going to see a new class of drugs based on miRNA and siRNA, much like the rise of recombinant protein therapeutics in the 1970s and 80s, or monoclonal antibodies in the 90s.”

Christoffersen sees regenerative medicine as another area with high potential for advancements in the coming decade. “Whether we’re talking about stem-cell therapy or other approaches, this is an area of rapidly growing scientific knowledge in our state. These technologies aren’t quite ready for therapeutic prime time right now, but I think we’re going to see a substantial growth in this space in the near future.”

“More generally,” continued Christoffersen, “We are seeing a lot of work in our universities that is helping us understand more about how biological mechanisms of action affect disease. I think this is going to open up significant opportunities for new therapeutic interventions at accelerated rates we’re not used to seeing.”

WILL EMERGING TECHNOLOGY CHANGE OUR APPROACH TO ASKING QUESTIONS AND SOLVING TECHNICAL CHALLENGES?

LG: The way scientific questions get asked and answered has evolved dramatically and will continue to do so. When I started in science as an undergraduate, you could define and run a single-day experiment and every result would be important because no one had ever measured that before. You didn’t have to think so far into the future. Now we have to aim higher. It’s easier to do experiments now, but the thinking part is more difficult, the stakes are higher, and we’re spending a lot of public or investor money to get the answers. But on the other hand, we’ve reached an interesting point where we understand enough to formulate the hard questions, have real goals, and solve what used to be difficult problems but are now just technical challenges. For example, at the UC Denver medical school there’s a big push for personalized medicine spearheaded by David Schwartz. Information-driven medicine is happening here in Colorado.

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PM: Speaking for ourselves at Clovis Oncology, we're definitely looking at questions in new ways. I do think what we're doing is truly next-generation oncology development, looking at more subset populations with companion diagnostics. It's very much a 21st-century oncology drug development paradigm.

WHAT WILL THE COLORADO BIOSCIENCE CLUSTER LOOK LIKE IN 10 YEARS?

PM: We'll continue to have a strong bioscience community here, although it may never be what Boston, San Francisco, or San Diego have. But we have a good base of technologies and university resources, a group of committed scientists, and well-developed, entrepreneurial managers, and that will continue to give rise to new companies. I think the big news to watch will be what impact CU Boulder's BioFrontiers Institute will have on the local industry cluster. They will provide compounds and technologies to foster new startups. We've seen a successful startup community in biotech over the past decade, but we haven't yet created a sustainable

enterprise that can act as a true anchor to keep startups here once they're on their feet. BioFrontiers may represent the beginning of that anchor.

RCC: Growth will continue here both in medical devices and in biotech/pharmaceuticals. I see a big potential confluence developing between Fitzsimmons, the Anschutz Medical Campus, and the BioFrontiers Institute. Collaboration between these three entities has tremendous opportunity to create a biotech cluster that will be best in nation.

LG: Reflecting on the early years of bioscience here, I look back at NeXstar, which was sold to Gilead for its one drug...and at the many other companies started here that were acquired for their single drugs, and it's clear that it's hard to build a sustainable, single-product pharmaceutical company because the cost of taking a drug all the way through development is so high, and so is the failure rate.

Now I see lots of companies with what look like sustainable platforms growing here. Of course I believe Somalogic has the chance

to be that kind of company, with technology that supports medical decision-making. But there are companies like DaVita, which is a phenomenally interesting company with plans to take what they're learning about managing patients on chronic dialysis and translate it to other disease management areas. We're going to see more of that kind of initiative from small and large companies here.

WHAT DO YOU SEE STANDING IN THE WAY OF FUTURE SCIENTIFIC INNOVATION, HERE IN COLORADO AND MORE BROADLY?

PM: We continue to lack a big, anchoring presence here—a big biotech or big pharma company like Genentech in San Francisco—that attracts and trains talent who goes on to found small companies that stay in the area. The University system remains an asset here that serves as the basis for new companies, but the challenge for us so far is that companies that have done well here get acquired and move away. If we were lucky enough to grow such an anchor organically or recruit one in, it would be a real boost to the industry here.

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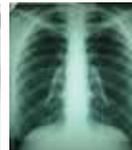
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I also worry about funding. Current cutbacks in government grant funds are chilling academic research, which of course is so important to the biotech industry. The simultaneous contraction of venture capital, particularly with respect to bioscience, makes it very hard to finance innovation today. It's particularly hard for individuals who are otherwise terrifically capable but lack a track record to access venture capital or grant money. This is true in Colorado and elsewhere in US, and what is interesting about it is that funds are drying up right as we are entering this golden age of biology. We know so much more about the mechanisms behind disease than ever before. It's my hope that enough companies will succeed here to re-attract investors to our state and reinvigorate funding.

KL: Threats to innovation? I don't foresee any (laughs). The thing is, Boulder has grown into a self-sustaining entrepreneurial ecosystem that attracts talent and capital. There are a lot of resources and technology, it's a beautiful place to live, and people want to be here. And it's not just biotech—the ecosystem is economically diverse. So at least in Boulder, I don't see any threats to biotechnology innovation as a whole.

RCC: We have a continuing need to increase infrastructure to help encourage companies to start here or move here. Developing space for clinical trials organizations, manufacturing facilities, and other resources will help build a critical mass of infrastructure, dollars spent, and money invested. That will be useful not just for startups and established local companies, but will also attract others to come and settle here.

LG: The thing I've just finally learned in the last five years is that the problems you think are going to be solved technically will be solved technically. The NIH budget shrinks and grows, funding comes and goes, but through the efforts of academics, industry, government, investors, and even small amateur inventors, the knowledge base will grow. So I don't see the daily worries about funding, tax breaks, etc. as true threats.

To me, the real threats are societal. As a species, we are capable of enormous denial, especially for technologies that are disruptive or that have to unsettle existing businesses or social paradigms. Doing science with optimism and hope is easy; getting it scaled up so that it helps people is the hard problem. 

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