

Technology Transfer Tactics™



The monthly advisor on best practices in technology transfer

Big return-on-investment from in-house venture funding

UMB New Venture Group's model succeeds in boosting region's start-up ecosystem

For TTOs in less than vibrant regions of the country for venture capital investments, getting across the Valley of Death can be treacherous, and often deadly without adequate funding. And that's particularly true for biotech start-ups and others with a long development timeline dependent on significant financial backing, even in the early stages.

The University of Maryland Baltimore (UMB), through its team at UM Ventures Baltimore (UMVB), has developed a successful approach to the problem by creating its own funding mechanism and bringing an expert team to bear on helping a small but high-potential group of nascent ventures validate their technology and de-risk it to the point where outside investors can envision a profitable return. And in creating the model, UMVB is actually helping to also create a bigger venture capital ecosystem for the future.

The New Ventures Group is the team tasked with building and managing this model and coordinating with the UMB licensing staff -- including starting companies, managing the IP fund, and making direct equity investments.

Half-baked companies

When **Phil Robilotto**, director of UMVB and an associate VP at UMB, came to the university a decade ago with industry experience at Celera, DuPont Pharmaceuticals, and Bristol-Myers Squibb, he was surprised by how early in development many of the TTO's projects and technologies were.

"They were working on technologies at a much earlier stage than a lot of things I worked on at Celera, and we were very much a research-oriented company," Robilotto says. "They were trying

to start companies based on [very early] technology, and a lot of them failed.... The technologies would have greatly benefited from being validated in an additional animal model or having some supporting basic toxicology studies completed prior to launching the company.... We felt like if we could provide this key supportive data on a bigger, grander scale at a contract research organization (CRO) externally or even somewhere within the university, that would be helpful in terms of attracting a third-party investor."

Robilotto went to his supervisor, UMB Senior Vice President James Hughes, to plead the case for expanding the UMVB team by bringing in a dedicated New Ventures team that could focus on start-ups and help "bake" the technology a little bit more. In addition to administration, Maryland state also supported the concept in the form of The Maryland Innovation Initiative, which the state launched at about that same time. It provides funding to PIs for translational research and additional funding if that technology is developed into a start-up company.

Project managing IP

When the licensing team identifies promising technologies, they bring them to the attention of the New Ventures group, who assess the potential, the quality of existing data, and the likelihood of finding an interested third party. They also consider whether there is anything they can do to help fast-track the IP's development. "In a lot of these cases," Robilotto said, "they may have some animal data.... It looks good, but it's often in a very small number of animals. And so, we'll repeat it, externally on a larger scale."

Before they move forward, the technology undergoes an independent review. The independent vetting is essential because, as New Ventures Group Director **Rana Quraishi**, PhD, notes, in university settings, everybody knows everybody. “You have a bias toward [the faculty]. So, to avoid that, we have an independent vetting process.” The New Ventures Group invites three independent outsiders to review the technologies and give their opinions. This vetting includes presentations from the PIs and the New Ventures Group.

About 60% of the technologies make it through the vetting process and are then funded by the New Ventures group. The team has evaluated 24 proposals so far. In the two and one-half years since Robilotto began the program, they’ve invested up to \$100,000 per technology -- about \$1M in total -- to generate the research and commercial outcomes shown in **Figure 1**.

They have now gotten a 15-to-one ratio of third-party investment to their \$1M in funding -- that’s \$15 million directed towards these technologies through either SBIR grants or from co-investment from third parties.

The group has an additional \$2.5M earmarked for the active technologies that meet their subsequent milestones. “We don’t put additional funding in unless we see that milestone one came out positively and that the projects have met the outcomes that we agreed we needed,” Robilotto stresses.

UMVB Equity Investments

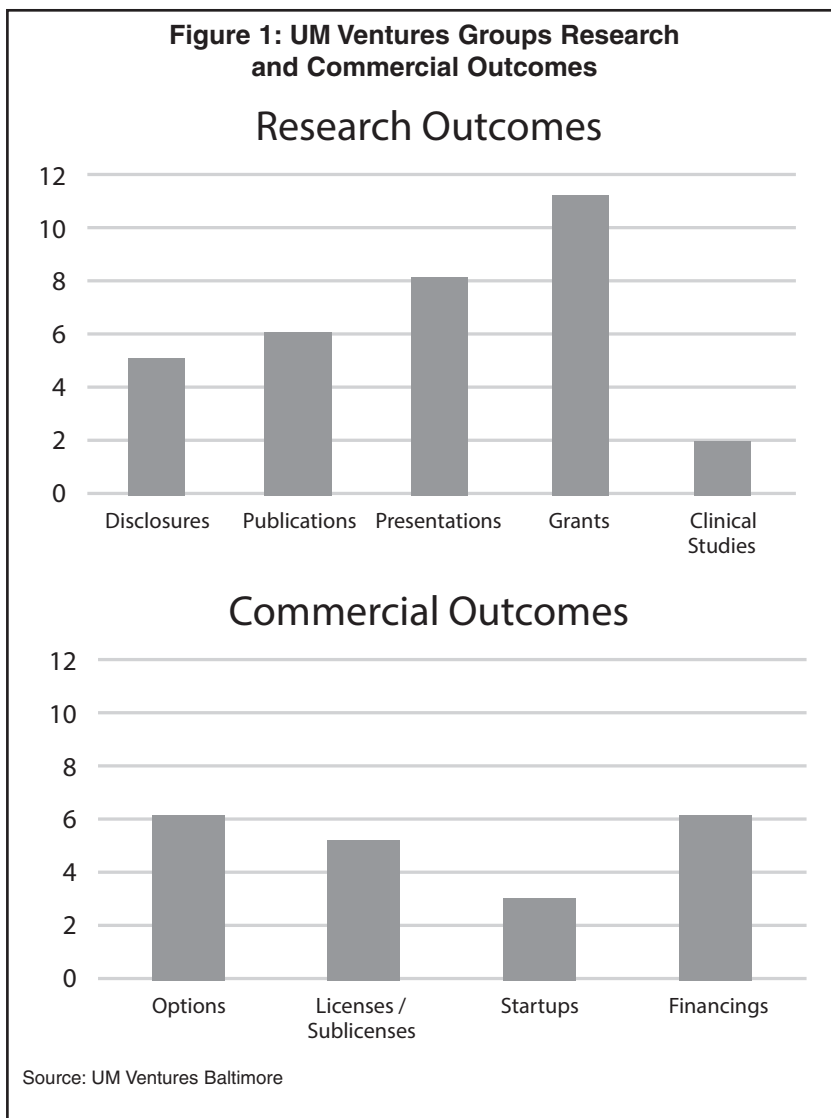
Ten years ago, before UMVB created the New Ventures Group, it was only generating about two or three new companies a year, and these were mostly failing. “Many of the start-ups never really could raise money,” Robilotto said. “They didn’t have established management teams. Our start-up model really wasn’t working that well.”

That’s why Robilotto sought -- and obtained -- institutional approval to make up to \$100,000 equity investments in select start-ups based on UMB technologies. “We feel comfortable in what we’re investing in because we’ve been working with both the

IP and the team for several years,” Robilotto says. They invested at the seed stage, which Robilotto says helped make these companies more attractive to other investors and bridged an important gap.

The program has been going strong ever since UMVB made its first investment in Harpoon Medical about six or seven years ago -- and that first investment definitely set the stage for success. Harpoon -- with a game-changing medical device for easier, safer, less invasive and shorter mitral valve repair operations -- sold in late 2017 to Edwards Lifesciences Corp. for \$100 million in cash plus milestone payments that could reach an additional \$150 million.

As UMVB racked up this and other successes, they expanded the program and reinvested in some of their other companies. Now, they make about two investments a year and are expanding



into later investment rounds. They did their first A round and their first B round in 2020. Their most recent investment in immunotherapy start-up Gliknik six months ago was their first C round. In all, they've made 16 investments in 11 companies. Four of the first five start-ups in which they invested have been purchased -- an enviable track record.

"It's been an outstanding program in terms of our 16 investments," Robilotto said. "When you look at the co-funding that these companies have been able to raise in those same rounds, along with SBIR grants they've been able to generate along with follow on investment capital, it [amounts to] almost \$90 million. This lack of funding was a serious difficulty for our start-up companies previously. Many had a really hard time raising these initial rounds."

This model has brought a big payoff for the university, starting with a 5X direct return as an investor. "If you include the common shares in the license agreement when the company is acquired, our return is about 14X," Robilotto says. "And just like most other universities, that flows back to the inventors, flows back to the school, and flows back to the department."

In addition to using its returns to invest in more companies, UMBV is building out other support elements, including a fully equipped lab and prototyping space that's open to all UMB start-ups.

The newly open prototyping space is based in the medical school for its focus on medical devices, and it is designed to decrease the time to commercialization. "Six, eight, 10 years ago, it took us a long time to get things prototyped, into animals or cadavers, patented, and then funded," Robilotto comments. "Now it's fast.... It's going to be a tremendous asset and a huge help to our med device inventors."

The staffing equation

New Ventures Group staff, who are university employees, can also fill leadership roles in new companies. The staff includes part-time venture affiliates and consultants who have the flexibility to decide to leave the university and join a start-up.

There are 3.5 full-time employees in the office, overseen by Quraishi. They work with the consultants and venture advisors, including physicians, researchers, investment bankers, former VCs, and accountants.

Robilotto emphasized that the New Ventures Group needs staff with specialized skills. Unlike many TTOs with "cradle to grave" staffing and with licensing officers doing all the IP management, the UMBV group has its own IP attorneys. "They're JDs and much better at managing intellectual property than anyone else," he says, allowing the licensing and new ventures teams to focus on what they do best as well. "I want the licensing officers to execute deals and work with the UMB PIs."

And he insists that New Ventures staff do just that -- dedicate their time to starting companies, which requires a different skill set. "They have to know how to raise money," he says. "They have to ideally have been part of a start-up before.... That's who we try to bring in, and then maybe one or two other people with complementary skills."

Quraishi formerly served as CFO of Helicon Therapeutics, and among the staff are a physician entrepreneur who raised \$50M for his start-up; a former investment banker; and a medical device engineer out of Medtronic.

The New Ventures Group also incorporates graduate students into the team via its President's Entrepreneurial Fellowship Program. Each year, the group selects eight students from the graduate school who work with the new companies "on a specific project or problem for that company," Robilotto explains.

Stepping in to management role

Staff members have the option to take a non-equity-holding management role in the new companies they work with -- a role for which the companies do not pay them (they are paid by the university). "Team members do this because income and job security are important at some stage, but at another point, they may be able to take more risk and go into a start-up, or do each part-time," says Quraishi.

"So we actually will form the company, and we'll step in and act as temporary management," Robilotto explains. "I can be on the board, and Rana or [associate director] Mark Lafferty may act as part of the company's initial management."

The first two companies they managed in this way were Living Pharma and SurgiGYN. "We only do one at a time because it's a lot of work," Robilotto says. "If there's a technology that looks

good, and we think it's ready to be in a company, but there is no management team for it, we will work with the PI and form a company with them.... It's a nice thing that we're able to do in select situations for really promising technology where we don't want to wait around until we can find either a licensee or new startup company management."

Lafferty, Quarishi, and another team member worked closely with Living Pharma, handling much of its day-to-day operations, to help get it off the ground. Meanwhile, the group launched its second company, SurgGYN, a medical device company. The New Ventures group was directly involved, finding partners to invest in the company and building prototypes.

Both companies exited via acquisitions within two years of launch. The short time between company formation and acquisition serves as a testament to the effectiveness of the New Ventures group's approach.

Quick sales, however, are not necessarily what the group is shooting for. "We're trying to support these companies longer to continue to de-risk them so that they are more valuable," Robilotto says.

Currently, he reports, "we're looking to do that in particular with Isoprene, which is a small molecule cancer therapeutic." Again, the group is managing the company, with Quarishi sharing leadership with the PI. She was instrumental in helping Isoprene get a \$2 million SBIR grant, which is currently providing the primary funding.

Building the ecosystem

The need at UMB for the New Ventures Group's approach was dictated in large part by the relative dearth of VC interest in regions that are ill-equipped to support a start-up ecosystem.

The long-term effect of the model, Robilotto hopes, will be to build a pool of entrepreneurs who will stay in the Baltimore area. The top-notch group working on the New Ventures team can sustain their livelihoods because the university provides a safety net. Few, if any, would have been likely to zero in on UMB technologies and start a company based on that technology without the university's support.

But once they have come to the area and worked first-hand with the new companies, without the worry of personal risk if those com-

panies failed, they are much more likely to join the companies -- and by extension build the talent and start-up pool in the Baltimore area. And with the New Ventures group constantly expanding, first time entrepreneurs will have a larger and larger group of talented entrepreneurs to tap into for the expertise.

"The more venture folks I can get into that team, the more companies we can start, the more investment we can bring in, the more entrepreneurs we can help attract and also help mentor," Robilotto explains.

Adds Quraishi, "When you have startup-driven ecosystems, you need to have opportunities for people, because, probably 75% of the time the companies are going to fail. [The founders will] have to move on," but without a vibrant local ecosystem there's no place for them to move on to. The New Ventures Group model, she continues, "incubates the local base of talent."

Using the model elsewhere

"The UMB New Ventures model is not for Boston, San Francisco, New York, or San Diego because they probably don't necessarily need it," Robilotto says. "But Baltimore, Washington, maybe Raleigh Durham, or some of the smaller cities like Omaha, Charleston, etc., could use it. There's probably a lot of great technologies and a lot of great ideas [in these places], but just not a lot of venture flow."

The model he created at UMB "is a nice way to help bootstrap your own sort of investment and start-up community for your city.... If this is working here, this could work in [other places] that have good technology, great universities, great research, have third-party companies that could invest or help support things but don't have a large venture presence. You have to build it up yourself, and then you can say, 'Hey, look, we're getting exits.' When the venture community starts seeing multiple acquisitions, that's when they're going to be interested. So, we've recently started thinking that this could apply to other mid-sized to even smaller metro areas as well."

Plans for the future

After starting out making small, early investments in UMB start-ups, the New Ventures Group is now co-funding projects with multiple affiliated

and other third-party groups outside UMB. Robilotto aspires to help co-fund more technologies and bigger rounds at a later stage.

The group is currently co-funding one project with a well-capitalized, external clinical group. “We set up go and no-go criteria for several experiments that we’ve been doing through third-party CROs and are just about to get the final results back this first quarter. If that comes out positively, our partner will make a seven-figure investment and launch the newco. We would not have quite the same active role that we have in Isoprene, but we could continue in an advisory/observatory role. And that’s what I’d like to see us be able to do more.”

Robilotto believes the technology of this company is “super promising.” But he emphasizes that it isn’t his perception that counts: it’s the opinion of expert third parties that can bring pre-clinical expertise and financial help to start companies and have them stay in Baltimore or elsewhere in the state.

“That is the goal for us,” he says. “That’s a great way to help with economic development... I’d love to see the program double in terms of our investment capability, see our exits double, and [the number of] our companies staying in Baltimore double.”

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