ARROWHEAD PHARMACEUTICALS

Arrowhead/Amgen Collaboration – Prepared Remarks

September 29, 2016

6:00 AM Pacific time

Operator

Ladies and gentlemen welcome to the Arrowhead Pharmaceuticals conference call. Throughout today's recorded presentation all participants will be in a listen-only mode. After the presentation there will be an opportunity to ask questions. I will now hand the conference call over to Vincent Anzalone, Vice President of Investor Relations for Arrowhead. Please go ahead Vince.

Vince Anzalone

Good morning everyone. We are happy to announce that Arrowhead and Amgen will collaborate on RNAi therapeutics against cardiovascular diseases. Our president and CEO, Dr. Christopher Anzalone, will provide an overview of the deal and give some color about what it means for Arrowhead, and we will then open up the call to your questions. Also with us today for the Q&A portion of the call are Bruce Given, our chief operating officer and Patrick O'Brien, our general counsel.

Before we begin, I would like to remind you that comments made during today's call may contain certain forward-looking statements within the meaning of Section 27(A) of the Securities Act of 1933 and Section 21(E) of the Securities Exchange Act of 1934. All statements other than statements of historical fact, including

without limitation those with respect to Arrowhead's goals, plans, and strategies are forward-looking statements. These include, but are not limited to, statements regarding the anticipated safety and/or efficacy of ARC-520, ARC-521, ARC-AAT, ARC-F12, ARC-LPA, ARC-HIF2 and our other programs, as well as anticipated timing for study enrollment and completion, and the potential for regulatory, commercial, and business development success. They represent management's current expectations and are inherently uncertain. Thus, actual results may differ materially. Arrowhead undertakes no duty to update any of the forward-looking statements discussed on today's call.

You should refer to the discussions under risk factors in Arrowhead's annual report on Form 10-K and the Company's quarterly reports on Form 10-Q for additional matters to be considered in this regard.

With that said, I'd like to turn the call over to Dr. Christopher Anzalone, President and CEO of the Company. Chris?

Chris Anzalone

Thanks Vince. Good morning everyone and thank you for joining us today. There may be some people on this call who are new to Arrowhead, so I would like to provide a brief review of the company before I talk about the Amgen partnership.

Arrowhead has built multiple platforms that enable us to develop therapies that silence target genes via a mechanism known as RNA interference, or RNAi. We have done so through internal innovation in RNAi chemistry and delivery as well as through acquisition, including that of Roche's RNAi business in 2011 and

Novartis' RNAi business in 2015. We currently have 3 drug candidates in the clinic and 4 preclinical programs. Our preclinical ARC-LPA program and a new program against an undisclosed cardiovascular target are the subjects of the Amgen partnership.

As we announced this morning, Arrowhead signed two license and collaboration agreements with Amgen to develop and commercialize 2 RNAi therapeutics for cardiovascular disease. The total potential deal value is up to $673.5 million plus royalties.

Arrowhead is receiving $56.5 million upfront, which consists of a $35 million cash payment and a $21.5 million equity investment from Amgen at a price of $7.16 per share of common stock. We are also eligible to receive up to $617 million in option payments, and development, regulatory and sales milestone payments. We are further eligible to receive single digit royalties on sales of products against the undisclosed target and up to low double digit royalties on sales of products under the ARC-LPA agreement. Amgen will be wholly responsible for funding and conducting all clinical development and commercialization activities.

Under the terms of the agreements, Amgen receives a worldwide exclusive license to our ARC-LPA program. Amgen also receives an option to obtain a worldwide, exclusive license for an RNAi therapy against an undisclosed genetically-validated cardiovascular target that Amgen has identified. Arrowhead will perform the discovery and optimization work and deliver to Amgen a potential product candidate, at which time Amgen will have the option to take an exclusive license. Both product candidates will employ Arrowhead's proprietary subcutaneous delivery technology.

This is a very important partnership for us and we view its value through 3 primary lenses:

1. Financial
2. Strategic, and
3. Company positioning

Lets walk through how the partnership relates to these categories and start with financial.

The financial benefits are clear. The $56.5 million upfront is substantial for a company our size and when combined with our financing last month, we have approximately $100 million of new capital. This provides a sizeable additional runway for us to continue development of our programs and drive our business forward. On the other side of the ledger, this reduces some of our forward costs because Amgen will assume the expenses associated with pre-IND and subsequent clinical activities for ARC-LPA.

In addition to the immediate benefits, there is significant potential mid- and long-term value as well. We are eligible to receive up to an additional $617 million in option payments, and development, regulatory and sales milestone payments. Further, the single digit royalties for the undisclosed program and up to low double digit royalties for ARC-LPA could represent substantial upside should the programs reach commercialization. Taken together; the upfront capital, decreased costs, and potential for ongoing capital strengthen our balance sheet in a meaningful way and help fund development of our broad pipeline.

Bringing in capital through partnerships was part of our financing strategy and it is a big accomplishment to have executed on it with the current deal.

Let us now move to the strategic importance of this partnership.

ARC-LPA is designed to reduce the production of apolipoprotein(a), a key component of lipoprotein(a), or Lp(a). Lp(a) levels are genetically defined, not influenced by lifestyle factors such as diet, weight or exercise, and higher levels of Lp(a) correlate with increased risk of atherosclerotic cardiovascular disease. Of critical importance, the cardiovascular risk associated with Lp(a) is **independent** of cholesterol and LDL levels.

We see this as one of the most promising untapped cardiovascular targets. There is currently no good way to deeply reduce circulating levels of Lp(a), and it is a liver-expressed protein so is a very accessible target for Arrowhead's proprietary RNAi-based technologies. Therefore, from a strategic standpoint, Lp(a) is a place where we should be and this is an area where we can create substantial value.

That value, however, can be difficult to build and is extremely expensive. We have known from the time we started working on ARC-LPA that large market cardiovascular targets will ultimately need a large partner to help with late stage development and commercialization. These are potentially long and expensive clinical programs, and a company of our size simply does not have the financial and commercial resources to take these products to registration and into the market. Amgen's extensive development, regulatory, and commercial expertise, and their commitment to their cardiovascular franchise make them an ideal partner for Arrowhead.

The undisclosed cardiovascular target we will work on with Amgen carries similar strategic value to that of the ARC-LPA collaboration and license. The big difference, however, is that the undisclosed target program is truly "found value". This was not previously one of our internal programs so any value that may accrue to us represents **actual** value created from **potential** value locked up in our technology. For both programs, we feel this deal allows us to participate in substantial potential upside with a partner capable of building out new markets.

Let's now discuss how this deal affects our positioning as a company. In a word, it provides validation: validation of us as platform company; validation of our technology, broadly; validation of our delivery capabilities that now include subcutaneous administration; and validation of our ARC-LPA program.

This collaboration represents the achievement of a corporate goal that we set as part of a strategic shift to seek preclinical discovery stage development partnerships that could expand the reach of our technologies in areas that are outside of our core focus or beyond our current capabilities and financial resources. As a platform company with highly versatile technologies, there are substantially more opportunities than we can support independently. These types of deals help us extract maximum value in areas that we may not pursue independently. They diversify our upside opportunities and mitigate our downside risks while still allowing us to keep our clinical and regulatory development staff laser focused on advancing our wholly owned candidates.

Our deal with Amgen represents a strong vote of confidence that we have arrived as a true platform company, and it supports our belief that Arrowhead is a partner-of-choice in the competitive RNAi therapeutics field.

We have been methodical about building out our discovery and development capabilities to enable us to be a strong and fast partner. This includes acquisitions, like the Roche and Novartis RNAi businesses, internal innovation, growth in headcount across key departments, and moving into a larger research and development facility before year-end that will allow us to properly support these types of deals. We now have a robust and versatile drug discovery and development engine, that allows us to create new RNAi therapies and advance them rapidly into the clinic.

Many discoveries are being made about the genetic basis of various diseases, and Amgen is clearly one of the industry leaders in this respect. We think that RNAi will play an increasing role in new therapeutic solutions for some genetically-driven diseases and that Arrowhead has built the most comprehensive portfolio of RNA structures, chemistries and delivery vehicles in the field.

Development of our platforms has been characterized by flexibility. For instance, we have found that different RNA structures and chemistries perform differently on a target by target basis. Because of this, we believe that Arrowhead's broad portfolio of RNA chemistries and formats, that allow us to optimize each candidate and use the best performing construct for a particular target, gives us an advantage over competitors and a point of differentiation. This is attractive to us for our own wholly owned products and may also be attractive to potential partners.

This philosophy has also driven the development of our suite of delivery technologies. These give us great flexibility with regard to the universe of diseases that we can address.

For example, our IV administered liver-targeted DPCs, like the ones used in ARC-520, ARC-521, and ARC-AAT clinical candidates, have achieved multi-log knockdown of liver-expressed genes after just a single dose. We think for diseases where maximal suppression of the target is required, this system will be attractive. It has also been shown in clinical trials to be well tolerated.

For chronic diseases of the liver where subcuataneous administration is preferable, we have the proprietary system used in ARC-LPA. There may be cases where intravenous injections are not ideal and less than multi-log knockdown or more gradual and steady state knockdown is preferred. This system may be well-suited for such applications. As an example of our progress on this front, we presented data in May showing that after subcutaneous administration in animal models ARC-LPA could achieve up to 98% knockdown with a long duration of effect that may enable monthly, bi-monthly, or even less frequent administration. Subsequently, we have continued to optimize the candidate and are achieving additional potency and duration gains.

Lastly, we are developing an extra-hepatic targeted DPC system that is designed to target tumors and other tissue types outside the liver. We have had some very encouraging data from a proto-typical version in our ARC-HIF2 renal cell carcinoma program, this data is available on our website.

We built this large set of capabilities to enable us to follow disease rather than follow a specific technology. In other words, our goal has been to solve medical problems regardless of where they are. This is a powerful concept as we develop our own medicines and as we help our partners develop theirs.

So to wrap up, we are thrilled to be working with Amgen on these cardiovascular targets. There are often just a handful of events in the life of a company that fundamentally change its course, and this feels like one of those events for us. As I mentioned at the outset, we view this partnership through 3 lenses: financial, strategic, and company positioning. Regarding the financial impact, this is a large deal economically, particularly given the early stage of development of the 2 programs. ARC-LPA is still preclinical and no IND-enabling studies have yet begun. The undisclosed target is still only that: we have yet to begin any research on that program. Strategically, we are a different company today than we were yesterday in part because we now have an ideal development and commercial partner for 2 large opportunities. From a company positioning standpoint, we can now be viewed clearly as a platform company with more validated RNAi technology and broad delivery capabilities. We look forward to continued progress and a long productive relationship with our colleagues at Amgen.

Before taking questions, let me address a question that we have received following Alnylam's after market announcement yesterday regarding their Alpha 1 antitrypsin program. For those of you who might have missed it, Alnylam announced yesterday at the oligonucleotide therapeutics society meeting that they had stopped their AAT program due to elevations in liver transaminases. They considered these elevations to be sequence specific and have gone back into pre-clinical testing to select a new sequence. Not surprisingly, this has caused some calls regarding our program. We have submitted a late breaker abstract to AASLD and if it is accepted, we will be presenting clinical data there. However, what we can say today is that we have not seen evidence for **any** impact of our investigational drug, which we call ARC-AAT, on **any** laboratory parameter, other than desired reductions in alpha 1 anti-trypsin levels. Specifically, we have not detected differences from placebo regarding liver transaminases. In the ARC-520

and 521 programs we saw no indications of transaminase changes in healthy volunteers. Transaminase elevations are a part of viral hepatitis so patients enter with elevated transaminases or can develop them during therapy as flares, presenting a challenge to all drug developers. However, we have not seen any transaminase elevations in the 520 or 521 clinical programs that have been interpreted to be indicative of drug-induced liver injury. This is something that we follow very carefully on a daily basis.

I would now like to open the call to your questions. Operator?

Operator

Operator opens the call to questions …