

## **Arrowhead Acquisition of RNA Assets and Site Frequently Asked Questions**

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### **1. *What did Arrowhead acquire?***

Arrowhead has acquired all of Roche's current RNA therapeutics assets and its facilities in Madison, Wisconsin. Roche assembled the infrastructure, technologies, IP, and team it needed to become a leader in RNAi in a way that only a large pharmaceutical company with substantial financial resources can. Specifically Arrowhead has acquired:

- Roche Madison Inc. (formerly Mirus Bio Corporation, acquired by Roche in 2008 for \$125 million), providing an advanced proprietary RNAi delivery platform known as Dynamic PolyCunjugates™ (DPCs);
- License from Tekmira Pharmaceuticals Corp. for proprietary Stable Nucleic Acid Lipid Particles (SNALP) RNAi delivery;
- Proprietary Liposomal Nanoparticle (LNP) RNAi delivery system developed by Roche;
- \$331 million license from Alnylam providing access to Alnylam's RNAi IP and Canonical siRNA structures;
- License from City of Hope providing access to Dicer substrate siRNA structures;
- License from MDRNA (now Marina Biotech) providing access to Meroduplex siRNA structures;
- A team of over 40 leading scientists in the RNAi field and state-of-the-art facilities and infrastructure in Madison, WI.

### **2. *How much did Arrowhead pay for the Roche RNAi Therapeutics business?***

Arrowhead acquired Roche's RNAi Therapeutics group, including its R&D center in Madison, personnel, and comprehensive technology IP portfolio. Roche received an equity stake in Arrowhead of just under 10% in restricted common stock. Roche was also given limited rights to negotiate for a defined number of products and will receive late-stage milestone payments, which only trigger after drug regulatory approval, and customary low single digit royalty payments based on sales on certain products.

### **3. *What is the estimated value of the business and assets acquired?***

Roche invested substantial capital to build its RNAi program. For instance, it paid \$125 million to acquire Mirus in 2008, and under the alliance agreement entered into with Alnylam in 2007, it paid \$331 million in upfront payments and an equity investment. Additionally Roche has incurred costs for other milestones, licences, collaboration payments and development costs. Arrowhead is fortunate to stand on

these broad shoulders. These assets are of great value to the Company because of synergies with our current RNAi technologies and how they will position us going forward. We believe that this acquisition positions the Company as a clear leader in delivery, which remains the great limiting factor in RNAi therapeutics. Arrowhead now has access to what we believe are five of the most technologically advanced small RNA delivery systems in the world. Beyond delivery, the company has acquired comprehensive R&D capabilities and an intellectual property framework on which to build diverse RNAi therapeutics. Through the RNAi licenses Arrowhead has acquired, the Company now has broad freedom to operate within the three primary siRNA formats. This provides us with the ability to optimize not only the delivery system by target, disease state, and organ system; but also the RNAi chemistry and siRNA structure. No other company has this type of flexibility to optimize RNAi therapeutics. Therefore, Arrowhead has substantial tools with which to build its own therapeutic pipeline, and this strengthens our partnering capabilities and places the company on a path toward financial self-sufficiency.

**4. *Were there other parties bidding on the assets?***

Yes.

**5. *Why did Arrowhead acquire these assets and operations?***

Arrowhead management viewed this as too big an opportunity to pass up. It would have been extremely difficult for any small biotech company to do what Roche did: it invested a very large amount of capital to systematically acquire all resources needed to build a pipeline of diverse RNAi therapeutics, from sequence to delivery. Roche then did not rush to the clinic, but rather spent time and resources developing and understanding its technologies. Therefore, what Arrowhead was able to acquire was a relatively mature and complete set of capabilities.

This acquisition is of significant strategic value based on the assets and the Madison team alone, and also provides accretive value when combining them with Arrowhead's existing RNAi assets. Arrowhead becomes a comprehensive RNAi drug company with multiple leading delivery solutions, access to broad RNAi IP, and a powerful engine for developing therapeutics. These can be used to build an internal pipeline of drug candidates and to enter into partnerships with potentially significant economics associated with them. The latter is an important part of the Company's capital strategy and the new assets and capabilities greatly enhance Arrowhead's value as a potential partner. The Company's model is to leverage its now substantial RNAi estate to secure partnerships that will pay for operations and drug development.

**6. *Will Arrowhead still seek to partner its RNAi programs?***

Yes. Arrowhead's strategy will be to leverage its robust RNAi portfolio and development capabilities to attract collaborations with pharmaceutical and biotech companies. The Company believes its partnering capabilities have been enhanced

based on the strength of its RNAi portfolio and newfound R&D facilities, both of which provide a foundation for achieving financial self sufficiency and increased shareholder value.

The combined new operation addresses what Arrowhead sees as an evolving need from Pharma for a full-solution, specialized RNAi partner. Arrowhead believes the transaction strengthens its partnering power as it can now offer potential partners a comprehensive solution with the following capabilities:

- Broad IP estate and technology licenses across several disease areas and indications;
- Multiple formats/strategies to engage RNAi mechanism;
- Multiple delivery platforms;
- State-of-the-art specialized facilities; and
- World class expertise and experience from target discovery stage through clinical trials.

**7. *Has this transaction changed Arrowhead's strategic initiatives?***

No. What has changed is the addition of R&D facilities making Arrowhead a comprehensive drug development company with in-house development resources. With this transaction, the Company gains more robust RNAi competencies that it can leverage, along with its new R&D capabilities to progress its RNAi and non-RNAi technologies and attract collaborations.

**8. *Will Arrowhead continue to advance its non-RNAi divisions?***

Arrowhead's commercialization strategy continues to include internal development and collaborations for its RNAi and non-RNAi programs. Arrowhead believes that Roche's veteran teams substantially increase its value and capabilities in both of these areas. With the state-of-the-art R&D infrastructure acquired in this transaction, Arrowhead plans to leverage these competencies for development of all of its programs.

**9. *How will Arrowhead fund its new operations?***

Arrowhead will fund its operations through a strategic combination of in-house development, partnerships and licensing agreements. Approximately \$6 million was raised through a recently announced private placement for continuing operations, and concurrent with the Roche transaction, Arrowhead announced that it had raised an additional \$4 million to fund initial operations at the new facility. The Company also entered into an agreement for up to \$15 million in future funding from Lincoln Park Capital to be drawn if and when needed. As mentioned, it is our plan and

priority to leverage partnership opportunities to bring in potentially substantial non-dilutive capital to fund operations of our drug pipeline.

**10. *How do these platforms differ from the current Calando delivery platform?***

Calando's technology is the only clinically validated means of delivering siRNA to organs other than the liver, and this is an important advantage. Arrowhead believes that the DPC, SNALP, and LNP technologies from Roche each have their own strengths in liver and non-liver delivery, and animal data Roche has generated suggest that the systems are also extremely safe. In addition, Arrowhead intends to explore the application of Leonardo Biosystem's multistage delivery platform combined with the Roche delivery technologies to make them even more efficient. This acquisition consolidates five of the most advanced nucleic acid delivery platforms as well as proprietary cellular targeting systems with the combined ability to reach a wide range of disease types and sites. One of the most attractive aspects of this acquisition is the integration of Arrowhead's technology into what Roche has built. Arrowhead understands that no single delivery platform will be optimal for all targets. With the addition of Roche's delivery platforms, Arrowhead is now able to offer the most comprehensive solution to Pharma partners and collaborators that want to target the disease types that fit with their own internal pipeline strategy.

**11. *What data has been presented on the technology/IP?***

Roche's technology and developments have been closely held. Arrowhead will work with the team in Madison to publish select data as appropriate, and provide investors access to data previously published.

**12. *What is the expected timing for progressing these technologies?***

Arrowhead will pursue clinical paths and partnerships to further advance these technologies. The Company's roadmap for commercialization and will provide additional detail on initial areas of focus at a later time.