

## Improved Sample Preparation for Molecular Diagnostics Cuts Time and Cost



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**CEOCFO:** *Mr. Hagedorn, would you tell us about Life Magnetics?*

**Mr. Hagedorn:** Life Magnetics sells sample preparation kits for life science. The first task, which requires 80% of the time from laboratory workers or medical technicians doing life science testing, is preparing the sample which means taking the raw biological sample and extracting just what you are looking for. Biological things are very complicated and finding only the material you want to test for is your first challenge.

**CEOCFO:** *What do you understand at Life Magnetics that allows you to offer a better product?*

**Mr. Hagedorn:** We provide a kit specifically for RNA isolation; for example, viruses are RNA. If you need to test for HIV or Zika you need to do an RNA test. Traditionally one of the difficult parts of doing RNA testing is that you need these expensive reagents to clean up the RNA sample. Our kits are a carbon which is highly selective for RNA. This allows us to extract RNA without DNA contamination, which makes it easier to do this type of testing.

**CEOCFO:** *Have different materials similar to this carbon, been tried before?*

**Mr. Hagedorn:** As far as we know they have not. The typical materials that they use are based on silica, but silica is not able to differentiate between RNA and DNA. The carbon material that we have invented can distinguish. As far as we know, no one else uses a carbon based extraction bead for RNA separation.

**CEOCFO:** *What gave you the idea that carbon base would work?*

**Mr. Hagedorn:** It was a publication in 2002 in Nature that they found a single strand of nucleic acid would bind to carbon. We knew it would bind but the trick was getting it to come off when you want it to. So it is being able to control that binding and release. Therefore, we worked for a while on engineering carbon that would be able to bind and then release from the carbon surface.

**CEOCFO:** *Is the medical community aware and onboard or skeptical?*

**Mr. Hagedorn:** Our first target customers are actually professors at universities because they are better early adopters. They will get excited about this kind of technology for doing life science research. After we have established the base the research community then we can target more diagnostic testing in hospitals. Right now we are selling our product to life science researchers.

**CEOCFO:** *What has been the response by current users?*

**Mr. Hagedorn:** The response is good. It is much easier and much more reliable. The reliability is what they have been most excited about and the fact that between sample and sample, they only have a 1% to 2% error on the amount of RNA that they get, and also they are saving money on the DNA clean up.

**CEOCFO: *Why is it more reliable?***

**Mr. Hagedorn:** I am not entirely sure about that. We expected the value proposition to be that we would eliminate the DNA cleanup stuff and those reagents are pretty expensive. What we did not expect was that it would actually be much more reliable.

**CEOCFO: *Are there regulatory bodies with whom you interact?***

**Mr. Hagedorn:** There will be one once we are ready to sell to the hospitals. When selling to life science researches, there is no regulatory approval that we need. Pharma research and university labs are already 60% of the market so we can get a pretty good start just selling to universities and farmer researchers.

**CEOCFO: *How will your pricing compare with the pricing of the current methods?***

**Mr. Hagedorn:** The price right now for an extraction is about \$2.00 to \$4.00 for the extraction reagent itself, and then for the DNA cleanup it is another \$4.00. The current total cost is about \$8.00. We are charging for our \$6.50 for the extraction reagent, so the extraction reagent is more expensive, but the total cost of the process is lower because we have eliminated the second step.

**CEOCFO: *Is it easy for researchers to understand that?***

**Mr. Hagedorn:** Yes it is.

**CEOCFO: *Is there a shelf life on the reagent?***

**Mr. Hagedorn:** No there is no shelf life. That is another improvement because the DNA was what had the shelf life so by eliminating that we have eliminated the shelf life of the reagent. The DNA is sensitive to environmental factors and temperatures.

**CEOCFO: *Are you funded for your next steps?***

**Mr. Hagedorn:** We got a grant from The National Science Foundation (NSF) and the BlueWater Angels in Saginaw, Michigan are our major outside investors.

**CEOCFO: *What is the timetable for the next year or so?***

**Mr. Hagedorn:** In the next year or so we are hoping to get about \$500 thousand in sales by the end of this year. Once we have about \$500 thousand in sales then looking at more medium sized biotech companies. Right now we are targeting mostly university professors. After that we will be targeting medium sized biotech companies.

**CEOCFO: *How are you handling the business side?***

**Mr. Hagedorn:** The business side seems easier than the science. My background is physics so we managed to figure it out so far. I imagine we are going to need an MBA eventually but for now we are just figuring it out.

**CEOCFO: *Do you need to maintain a large inventory?***

**Mr. Hagedorn:** The manufacturing is entirely automated. The system will produce as much as we need, so we turn it off when we do not need any more. The employers are mostly focused on research and sales and the manufacturing does not anybody there to do it.

**CEOCFO: *What else does your science and technology lend itself to?***

**Mr. Hagedorn:** Our underlying technology actually allows us to separate single strand from double strand in nucleic acid. It is not specifically RNA; it is really single versus double. What we are thinking about down the road is diagnostics where we can take synthetic nucleic acids like artificially created nucleic acids which would be taking an RNA strand and make it double stranded and we can then selectively pick out specific sequences and do analysis. We are hoping down the road that we can actually do our own not just sample preparation but the complete diagnostic package.

**CEOCFO: *Why pay attention to Life Magnetics?***

**Mr. Hagedorn:** Medical testing in general is very concentrated on hospitals. We hope that our technologies will help start to reverse this trend and make testing more delocalized by eliminating some of the barriers to molecular diagnostics in the field by eliminating these enzymes that are temperature sensitive, we can start to do more delocalized testing which would take the focus off of hospitals for example and put more emphasis on local facilities.