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Developing a New Ceramic Membrane Filtration Technology that will Lower the Energy Cost for Purifying Chemicals, Fuels and Water, Cerahelix, Inc. is Helping a Variety of Industries Move Towards Conserving Energy while Achieving Tighter Regulation Requirements for Product Purity

Clean Technology
Filtration/Nanotechnology
(Private)

Cerahelix, Inc.

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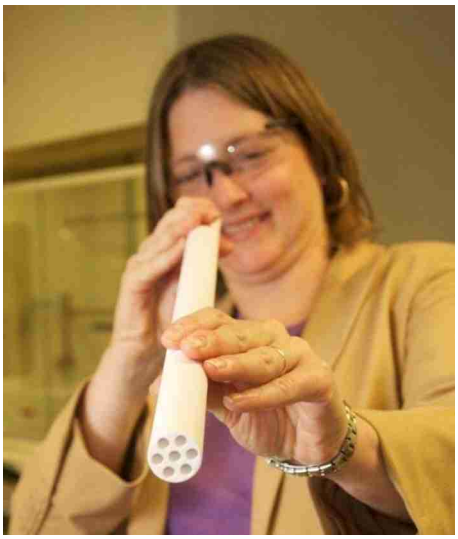

Susan Mackay
Chief Executive Officer

BIO:
CEO Susan MacKay has 12 years of industry experience in product development and materials R&D including roles at 3M and Physical Electronics, Inc. Prior to founding Cerahelix, she was the CEO of Zeomatrix from 2006 until 2011. She has a Ph.D. in Chemistry from the University of North Carolina- Chapel Hill and was named a Mass High Tech "Woman to Watch" in 2011.

Company Profile:
Cerahelix, Inc. has developed a breakthrough in filtration- a ceramic membrane that provides the durability of ceramics with the small pore size and selectivity of polymer based nanofiltration membranes. Products made using our technology filter water three times faster and remove contaminants ten times smaller than other ceramic membranes used today. Our product conserves both water and energy which is a cornerstone of clean technology.

Interview conducted by:
Lynn Fosse, Senior Editor
CEOCFO Magazine

CEOCFO: Ms. Mackay, what is the overall vision at Cerahelix?
Ms. Mackay: The vision is that we are developing a new materials based filtration technology, that will lower the energy cost to purify chemicals, fuels, products and water, in a variety of industries.

CEOCFO: What is available today and would you tell us what your technology is different?
Ms. Mackay: In the field of separations technology the traditional methods include filtration and seventy percent of that market is treating water. Filtration is a lower energy process to purify solutions. Water is a critical solution for a variety of applications, it is not only for drinking but for use in creating products in the biopharmaceutical and food and beverage industries. Our product can help industries that have relied to date on more energy intensive processes to move towards conserving energy while still achieving the tight regulations required for their product purity.

CEOCFO: What are you doing that is making it more energy efficient?
Ms. Mackay: It is a typical nanotechnology idea where what we are doing is at a very small scale, creating an improvement below where people can actually see. We take a common material, ceramic, that is already used in filtration and we create a thin layer on top that has a nanostructure that can remove dissolved contaminants. We are not removing particles, we are removing dissolved contaminants like disruptive hormones or metals or other things that people do not want in their water or in the product they are going to consume. We can remove those with our filter and it does not take much energy because we make the holes in our filter so regular and small. Because we are able to do that in a reproducible way, things pass through our filter quickly so we can treat the same amount of solution and it does not take a lot of pressure to push it through our filter. Pushing it through the filter is the energy part of the equation.

CEOCFO: What materials are used for the filter?
Ms. Mackay: We can make it out of a variety of materials, one of them being a metal oxide ceramic, like silica, or titania. They are not plastic so they can be reused and are more rugged and able to last longer.

CEOCFO: Has there been attempts at making a similar product in the past?

Ms. Mackay: Yes, there are some types of ceramic materials that can filter just as finely but they are more expensive to make and use more energy... What is unique about our process is it is very robust, we can consistently make the same material and it is much more scalable.

CEOCFO: Where are you in the development and commercialization process?
Ms. Mackay: To date, we have used federal funding through the Small Business Innovative Research Program to develop our prototype. We have done lab testing and bench scale testing. We are just now working with some initial partners to do what is called a pilot scale test.

CEOCFO: Have people been paying attention or is it too early?
Ms. Mackay: We have had some attention. The funding we have had is through the National Science Foundation. Because we are pursuing patents and intellectual property, we have not published any scientific papers on what we are doing. Most of the interest has come from word of mouth and the people we have spoken to directly when we talk to customers and potential partners.

CEOCFO: Has the industry been actively looking for better solutions?
Ms. Mackay: Yes, several different industries have and we are talking to some that are moving that way. There have been some traditional users of filtration, and now what you are seeing is other industries that maybe have not used it in the past are starting to look at it.

CEOCFO: Are you funded well enough to get through the next steps?
Ms. Mackay: Right now we have raised a seed round of financing and we have additional SBIR funding from the federal government, as well as matching funds. To get through the pilots, we are funded through our initial pilot study and then will begin pursuing follow-on funding.

CEOCFO: Where will the manufacturing take place?
Ms. Mackay: Since it is a nanoscale coating, it is not a large volume production, so we will produce the coating ourselves because that is where all our intellectual property and expertise lies. We will not build the actual filter support and filtration systems, we are working with partners to build those systems. We have actually spoken to some large international membrane or filter producing entities. They are interested because it is a new product for them also.

CEOCFO: How does the cost compare with what is available today?
Ms. Mackay: Initially we are competing with other ceramic filters so the cost is the same or less. The real challenge will be down the road as we try to penetrate with the higher growth markets where some of the competition can come from less expensive polymer membranes. At that point, it is an issue of getting customers to invest more upfront in capital with the savings coming over time. Right now our ROI with the customer is under two years. We are sticking initially with problems that customers have no other way to solve.

Our product can help industries that have relied to date on more energy intensive processes to move towards conserving energy while still achieving the tight regulations required for their product purity. - Susan Mackay

CEOCFO: What is the market opportunity?
Ms. Mackay: The type of high-end filter that we are selling which can remove the smallest contaminants is about a $1 billion a year global market. The largest part of the filtration market has always been ultra filtration, but the fastest growing segment is the one we are in.

CEOCFO: Why should investors, potential partners and distributors take a look at Cerahelix today?
Ms. Mackay: For potential investors, we do not know when we will be doing a series-A, it really depends on the next year of work and how far we might be willing to bootstrap. The best time to invest in Cerahelix would be in the early stage because the type of company we are is fast growth and we are well positioned for forming strategic alliances with larger scale partners, which is the trend in the filtration industry. For investors, if you are interested in the clean tech investment, we offer a great deal of potential. For strategic partners, what we are doing is unique, there has been a great deal of interest in seeing if there are new technologies in ceramic membranes. Most of the new technological advances have been in the polymer membrane space and I think especially in Europe and Asia, they tend to see the advantages of ceramic membranes which are in the fastest growing markets for filtration.

CEOCFO: What should people remember most about Cerahelix?
Ms. Mackay: Right now, it is an important year for Cerahelix. We are currently a semifinalist in the Cleantech Open competition and I am working hard to raise the profile of the company. Despite the overall worldwide economic news, it is a pretty exciting time to be a materials company in this space. The markets we are in are going to grow because water is only going to get scarcer, energy costs are rising, and regulations for providing pure and cleaner products are increasing. The market drivers of what we are doing are all in place and I feel pretty confident that the market is going to be there. Now my job is to get the technology ready and get the product launched.