

## Team Kilo develops lighting technology to aid stabilization and growth of NICU babies



Kilo Medical Solutions is a medical startup that developed a product that can be hooked up to incubators to control lighting for infants in the Neonatal Intensive Care Unit (NICU). (Provided photo)

By NICOLE SHELDON

Kilo Medical Solutions is a medical startup that developed a product that can be hooked up to incubators to control lighting for infants in the Neonatal Intensive Care Unit (NICU). The technology is called Brise-Solette, and it consists of a system of films used to imitate a womb-like optical environment to improve the health of babies born prematurely, while preventing them from being exposed to bright lights in the NICU.

The company, based in Richmond, Va., is one of 10 finalist companies in the optics, imaging and photonics industry selected to work within the Luminate NY accelerator. The \$25 million accelerator program — which is funded by the Finger Lakes Forward Upstate Revitalization Initiative and administered by NextCorps — provides each finalist with an immediate investment of \$100,000 and months of support to heighten the speed of the commercialization of their technologies and businesses. On Demo Day in September, the startups will compete for up to \$2 million in follow-on funding.

“Light can be a tremendous resource within health care settings, dramatically impacting the treatment and outcomes of patients. Kilo Medical Solutions is harnessing this potential to solve a very real problem in neonatal care,” said Sujatha Ramanujan, managing director of Luminate. “Our region, with its extensive universities, hospital systems and photonics cluster provides startups such as Kilo with an ecosystem to rapidly develop, test and iterate light-focused technologies that can save lives.”

In the U.S., one in 10 babies is born prematurely. Currently, fabric covers are used to control light conditions for babies in the NICU, but the fabric covers pose safety and sanitary issues that make it difficult for infants to establish their circadian rhythm, gain weight and stabilize vitals.

Brise-Solette is a device that is applied to the outside of the incubator and gives nurses complete control of the lighting, allowing for customization based on infants’ needs. The films are programmed to adjust light transmittance as a response to various variables, such as the baby’s vitals, caretaker input and time. Joshnamaithili Seelam, founder and CEO of Kilo Medical Solutions, further explains the devel-

opment of Brise-Solette.

**How did you and your team develop the concept for your product?**

**Joshnamaithili Seelam:** The concept came to us in our biomedical engineering capstone class. An experienced neonatal nurse from Children’s Hospital of Richmond (CHOR) presented a challenge that she was facing with fabric blankets in the NICU. She and her team were frustrated with using traditional blankets to cover neonatal incubators. The blankets were helpful in preventing premature infants from being exposed to bright lights, but they raised safety and sanitary concerns over time. The biggest concern for the clinical care team was that they weren’t able to see the infant when the incubator was covered. As biomedical engineering students, we were asked to find a solution that eliminated these risks while still preventing infants from being exposed to bright lights.

Keeping all of the disadvantages of fabric blankets in mind, the team designed Brise-Solette — a disposable blanket that uses tinting film technology to mimic the light environment of a mother’s womb. Through the use of an electrical film, we can eliminate the need for a fabric blanket, reducing infection risk and providing a dark/womb-like light environment that offers a clear visual of the infants during medical emergencies.

The solution leverages automated cycled light to promote an earlier development of circadian rhythm for premature infants in the NICU. By minimizing environmental stimulation in the NICU (such as light and sound) and mimicking womb-like light and sound, we can reduce infants’ stress, stabilize their vitals and help them sleep longer so that they can grow healthier faster. The more time they spend sleeping and growing healthily, the sooner they can be discharged from the NICU.

**What drew you and your team to designing a product for premature infants?**

**JS:** The team has a strong passion for making an impact in health care through medicine and medical devices innovation. Our end goal is to create a solution that will impact the lives of others. Personally, I have always had an interest in women’s health and pediatric care. I had considered becoming an

OBGYN prior to working on this product. My passion for pediatric and neonatal care made it easy for me to decide to work on a product that helps premature infants.

**How long have you been working on Brise-Solette?**

**JS:** The team has been working on Brise-Solette since November 2018. Team Kilo has raised more than \$80,000 in grants and competitions, and this has helped us build an initial prototype. We participated in the Raleigh Internet of Things (RIoT) RAP accelerator program, completed an intensive customer discovery program through the National NSF I-Corps program and have partnered with early clinical adopters to conduct pilot and clinical studies.

**Who is the target audience for your product?**

**JS:** The target audiences for our product are care providers in NICU departments, NICU parents and incubator manufacturing companies.

Our product is specially designed for NICUs that have open-bay layouts, which is a large room with 15 to 20 infants. These rooms make it difficult to control the light environment for each infant individually. For instance, when an infant needs care, the lights in the room need to be turned on and the stimulation negatively impacts other infants in the room. Our product, a film that is placed on the outside walls of the incubator, blocks infants from being overexposed to ambient/room light. We plan to also integrate noise-reducing capabilities into the solution in the future.

**What made you look to Rochester to further your product?**

**JS:** Rochester is known for optics, photonics and imaging technologies. We applied to the Luminate program to support further development of our product, to gain access to industry specific talent in optics and photonics and to be part of the Rochester network including working with local NICUs.

**Tell us about your experience being in Luminate.**

**JS:** Luminate is one of the most educational and well-known accelerator programs. The funding and access to the expertise they provide has helped us, as an early-stage company, to build a profitable business model. The experience and valuable lessons I am learning through the program are shaping me to become a stronger, smarter entrepreneur.

**What are you hoping to achieve during your time in Luminate?**

**JS:** We hope to utilize Luminate’s expertise and resources to fill in gaps that exist in our business model and to build our next-generation prototype for pilot studies. We are also looking to expand partnerships with research institutions (such as with the Rochester Institute of Technology and the University of Rochester) in the Rochester, Buffalo and Syracuse areas.

**If Kilo Medical Solutions wins, what do you plan to do with the \$1 million in follow-on funding?**

**JS:** With the follow-on funding, we would like to start the manufacturing process in Rochester and use the available resources here to design, build and distribute our products to early adopters and hospital partners.

We would also like to use this funding to expand Kilo’s team and to partner with research facilities at the universities in Rochester to conduct clinical studies.

*nsheldon@bridgetowermedia.com / (585) 363-7031*