



ECG Identity Authentication with Nymi Wristband Technology

**Healthcare
Cardiac Rhythm Biometrics**

**Bionym
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**Karl Martin
CEO**

BIO: Karl Martin had always known that he wanted to create things. From building circuits and robots in school to developing the biometric and cryptographic systems with Bionym, Karl has been able to put his engineering know-how to work, making things people never thought possible. Karl has a B.A.Sc. degree in Engineering Science, and M.A.Sc., and Ph.D. degrees in Electrical and Computer Engineering, all from the University of Toronto. He founded Bionym in 2011 with his co-founder Foteini Agrafioti, and launched the Nymi in September of 2013.

About Bionym:

Bionym is a team of thinkers and innovators aimed at shaping the world

of technology through biometrics, authentication technology, and our concept of identity. We have created the Nymi, a wearable wristband that uses a person's unique ECG to authenticate identity. The Nymi lets you seamlessly interact with your technology through gesture control and BLE.



**Interview conducted by:
Lynn Fosse, Senior Editor
CEOCFO Magazine**

CEOCFO: Mr. Martin, would you give us an introduction to Bionym?

Mr. Martin: Bionym is a biometrics company. We have existed for about two and a half years. We are based in Toronto Canada. We are actually a spinoff of the University of Toronto. It was founded by cofounder and I, Foteini Agrafioti. We are both PhD graduates. We founded the company about two and a half years ago (2011) and we had a variety of technologies in the biometric space that we are looking to commercialize but over time we focused on a single technology which was using the electrocardiogram, which is the ECG that signals that the heart produces as a unique biometric. Like a fingerprint, face or iris, we have technology that will allow you to use the electrocardiogram (ECG) as a unique biometric signature. More recently we have put this into a complete solution with hardware into a wristband. The wristband is called the Nymi. The Nymi is a wristband

that authenticates the identity of the wearer based on their unique electrocardiogram. By knowing the identity of the wearer it then can communicate to the outside world and be able to bypass passwords, PINs as well as keys and key cards. Anywhere a person's identity might be needed both for security applications and to provide a personalized user experience for smart environments or smart offices.

CEOCFO: Does the heart beat change at all and if so do you make adjustments for that?

Mr. Martin: Definitely the heart rate changes. What we are actually using is the shape of that electrocardiogram wave and that shape, while it might become compressed or expanded based on your heart rate, there are certain unique features of that shape that do not change. Our algorithms extract features and for them to be useful as a biometric they have to be both unique and permanent, meaning they are not going to change from day to day. That is our secret sauce, our intellectual property.

CEOCFO: That is incredible!

Mr. Martin: Yes, not many people have known that before we launched. The useful thing, compared to something like a fingerprint, is that your electrocardiogram is not left everywhere. With Fingerprints, you are leaving them everywhere and a face image can be captured at a distance without your permission and the same with your iris but your electrocardiogram is protected inside your body and requires direct contact with your skin in order to capture that so it gives you a greater level of control over how you are using your biometric. We then combine that with

wearable technology to make it very simple for people to use.

CEOCFO: Would you give us a sample of the markets you are approaching where your product would be used?

Mr. Martin: We launched about a month ago and we are taking preorders directly on our website. We have actually targeted the general consumer and this was a trial to see whether the general consumer would be interested in technology like this, but we felt that the world was ready for something like this. It has certainly been validated as we generated a ton of interest and preorders. In a few weeks we sold more than five thousand wristbands and also the media interest has been very broad, over two hundred media pieces. For us that was the validation that the general consumer is interested in technology like this. That being said there are other more specific verticals that we have had that we will focus on in time and one is the corporate enterprise world for both physical access security as well as logical accessing computer networks in computer systems. Another area is healthcare; many use cases within healthcare including for example doctors and sterile environments that want to interact with technology computer terminals without touching, so this concept of touch less access and interaction is something that specifically resonates within the healthcare area. The product also has simple gesture recognition. I get to bounce off this idea that you can now use your identity to access things wirelessly if you add on top of that simple gesture recognition as a way to indicate what you want to do with your identity. For example opening your car: You can determine whether you want to open the front door versus open the trunk of your car by a simple gesture that can indicate your intent. It is about identity and giving the users power to control that and decide how to use their identity for a variety of applications.

CEOCFO: Is there a specific device needed on the other end for the

enterprise to put on the doors that they can read your product?

Mr. Martin: The main communication radio is Bluetooth, so for the first generation to have a receiving device that talks to the wristband it does require Bluetooth. The nice thing is Bluetooth is becoming more and more common, so other than the Bluetooth it just becomes software in order to communicate with the wristband.

CEOCFO: You mentioned you are currently marketing these through the website. Have you looked ahead and seen whether or not you are going to put together a sales team to approach this and where are you in the process of that?

Mr. Martin: Long term this product makes sense to be in retail stores and right now direct through our website the intention is to target those early adopters but also much of our initial

“What we are doing is turning everything around. It is essentially a product that unlocks everything. You have wearable technology, identity and security as well as biometrics. There is no other product that is doing what we are doing and we are fulfilling a need for both today and the future.”

– Karl Martin

engagement is about getting developers onboard to develop applications for it. In the coming months much of our outbound activity is actually about the developer engagement so that we can encourage a healthy ecosystem of applications and other devices that communicate with the wristband. Moving forward we are going to have multiple strategies both from sales and retail as well as partnerships. We do expect we will have systems integrator and partners that will want to make bulk purchases, so that would be another strategy that we will be working on as well.

CEOCFO: I assume you have people coming to your website from all over the world?

Mr. Martin: Yes our orders last time I checked are from seventy-four different countries. It is worldwide and right now our marketing is English only but we certainly have plenty of orders from

non English-speaking countries. Because we are targeting consumers in this first phase of the product release, much of our marketing is based on social media, so we do a lot of engagement with people directly on social media; word of mouth is extremely important. Our initial target is going to be early adopters and these are going to be people who are going to be interested because of the new kind of technology and there is really nothing else out there like it. Those are the kinds of people that tend to be active on social media and forums. Down the road we will probably be doing much more direct marketing.

CEOCFO: Are you finding that your current consumer purchases have a direct purpose for the product such as entering into a specific place or is it more inquisitive in nature like “Hey let’s check this out and see what it does?”.

Mr. Martin: We are seeing two kinds that are the most common. One is the more inquisitive one where they want to be the first ones to get their hands on this new kind of technology. The other side which we found has resonated the most is simply

to replace passwords so not having to enter passwords to unlock personal devices as well as down the line completely not having to manage passwords for online accounts as well which is one key-use case that really works for them now.

CEOCFO: Is this an ease-of-use product where it is easy to set up or is it done through a computer?

Mr. Martin: It is very easy. The idea is that when you get your wristband there is a registration process where we need to capture your electrocardiogram to create a biometric template. This is actually done in communication with an application that you can download. You can either put it on an android device or a computer so the registration process takes about two minutes. You have to sit there and touch the wristband for two minutes as it captures the ECG and it communicates that to our

application and generates the biometric template. After that you are ready to go. After this process it is now able to recognize you and then you can then register it to unlock your personal devices and the applications that are being developed in the future will also have them unlocked for example blue tooth locks on your front door. Each one has a separate provisioning process but they tend to be quick and painless.

CEO CFO: Are you still spending a lot on R&D or is your product pretty much set for now?

Mr. Martin: We definitely still have to continue doing R&D. This is a first generation product and there are a couple of things still being finalized but even once those things are finalized, being a technology-driven company, we cannot sit around and just be totally sales-driven. We are immediately working on the second generation and working on improving the technology and adding new features, so the R&D never stops here.

CEO CFO: Development and bringing the product to the market is expensive. How is Bionym set with funding right

now and will you be reaching out in the future for more funding?

Mr. Martin: We are funded right now and we are both venture capital and angel funding. That being said we do expect that we will have future rounds of funding mainly from venture capital sources and we expect our next round would likely be happening by the end of the year. We are at the early stages of the company, so expect that there will be at least one or two more rounds of funding.

CEO CFO: Why should the business and investment community pay attention to Bionym?

Mr. Martin: Bionym is in a very unique position in a few different ways. One is that what we are doing is involved in the convergence of multiple hot trends right now in categories that are moving like crazy so first is wearable technology. It is a very young market and still trying to figure itself out but growing like crazy. The other is identity and security which is a space that is completely ripe for disruption. You can look at single-use biometric technology as ripe; putting a fingerprint reader on an iPhone is pretty narrow use case. What we are doing is turning everything around. It is essentially a product that unlocks

everything. You have wearable technology, identity and security as well as biometrics. There is no other product that is doing what we are doing and we are fulfilling a need for both today and the future. We have generated a ton of interest and certainly the growth prospects are huge for what we are doing.

CEO CFO: Is the cost of the device consumer-friendly cost right now?

Mr. Martin: On preorder right now you can get it for \$79. During this phase we will reserve your unit for when we are shipping it so we are shipping around April and May of 2014 and after that the price will go up so I would encourage people to preorder now.

CEO CFO: Do you have wristbands that women would find attractive?

Mr. Martin: We do have multiple colors. When you are talking about wearable technology you are talking about fashion so right now we do have three colors, black, white and orange. In terms of our next generation or our future roadmap we are really thinking about how to make that more flexible as a fashion item so that it can be personalized to anybody's needs.



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