

降低乳癌篩檢門檻 博士生造福基層婦女

Lowering Threshold for Breast Cancer Screening, PHD Student Bears Good News for Grassroots Women

Mamosound - Alec Nicol

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科學除了可推動文明進步，若應用得宜，還可造福小市民。眼前這位來自美國的男生Alec Nicol正正是身體力行的榜樣。他年僅27歲，看起來非常年輕，但原來早已完成3個理學士學位加一個博士學位，絕對稱得上是學霸。然而，他並不安於象牙塔之內，而是想方設法運用所學，以科學知識為社會帶來影響力。就這樣，他踏上創業之路，研發出「Mamosound」，務求造福基層婦女。

Scientific advancements, when employed properly, can greatly benefit people. Alec Nicol, a young man from the U.S., is a model of putting this into practice. At only 27 years old, he has completed three Bachelor of Science degrees and a PhD: a straight-A student without a doubt. Yet, his visions are beyond the ivory tower. His aspirations led him to find ways to apply scientific knowledge and to make an impact on society. Thereafter, Alec sets out to start his own business "Mamosound" in the hopes of helping grassroots women.

Mamosound是一個手提式乳癌檢測儀器，運用超聲波和人工智能技術，讓婦女以較低成本去檢查自己有否出現早期乳癌跡象。產品名字聽起來易讀易記，其實就是乳房造影 (Mammogram) 與超聲波 (ultrasound) 的濃縮結合，代表產品的主要功能與技術。一個年輕男生，為何會與乳癌拉上關係？

5個姨姨患乳癌 生於美國已算幸運

「我母親那一邊的家人，有很深的乳癌家族史，很多人都有做過手術移除惡性腫瘤。因此，我總覺得應該把我的博士研究用在乳癌上。」 Alec 說，他唸博士期間是研究癌細胞影像的。他母親一共有7姊妹，當中有5個姊妹都曾患上乳癌，程度或輕或重。當Alec有第一個較年長的姨姨被診斷出患上乳癌時，他記得自己正就讀高中，「其後每個阿姨和我母親都知道自己也有風險，他們都知道需要定期去檢查。」

Alec認為，現在我們已有先進的科技，可以讓人及早辨識到乳癌跡象，唯一問題是相關醫療儀器較為昂貴，未必人人能應付，「幸運地，我的家庭來自美國，我們每人都有工作，有醫療保障，因此可應付這樣的醫療開支。但你放眼世界，整體來說，很多人都沒這樣的機會。所以我們不能忘記這些人，並嘗試把科技的門檻降低，讓他們也有機會使用這些及早辨識和診斷癌症的技術。」 Alec語重心長，相信就是這份初心，推動他研發Mamosound以至創業。

從小熱愛科學 唸博士仍有空創業

信念固然重要，實力更是不可或缺。Alec雖然年僅27歲，但從訪談得知他原來已經完成3個理學士學位，分別是生物化學、化學、生理學的學位。2014年，他更考獲香港科技大學的獎學金，用4年時間完成生物醫學工程系的博士學位。每每談及學業，他都顯得從容不迫，游刃有餘，相信這是因為他打從心底熱愛科學，也擅長於此。在這方面，Alec的父母可謂功不可沒，「小時候我們經常一起去科學館，也一起出走大自然，去行山、狩獵、釣魚。我常常拆開各種事物，看看裡面的樣子。」 Alec笑說。「為什麼葉子是綠色的？為什麼秋天它們會變紅？其實就是要擅於觀察和不斷發問。說到底科學就是提出有趣的問題。」

在鼓勵觀察、發問、實驗的環境下成長，塑造出今天Alec的科學頭腦。

“Mamosound” is a portable medical device that uses ultrasound and artificial intelligence for early breast cancer detection at a comparatively low cost. The name of the device blends together the words Mammogram and ultrasound, making it easy to pronounce and remember. It also represents the product’s function and technology. But r how did a young man involve himself in breast cancer screening technologies in the first place?

Five Aunts with Breast Cancer Lucky Enough to be Born in the U.S.

“My mother’s side of the family has a long history of breast cancer, and many of them have had surgeries to remove malignant tumours. So I’ve always hoped to apply what I learnt in my doctoral studies on breast cancer,” says Alec, whose PhD topic is on cancer cell imaging. His mother has seven sisters, five of them having had breast cancer of various degrees of severity. Alec was in high school when one of his older aunts first got diagnosed with breast cancer. “That was how all my aunts and my mother knew they were at risk too and so they know they need to for screenings regularly.”

Alec believes that although we have now the advanced technology needed to let people recognise signs of breast cancer at early stages, the medical equipment required for the tests can be too expensive for everyone to be able to afford. “Fortunately, my family comes from the U.S. and all of us have jobs that cover health insurance, which helps us with the medical expenses. But if you look around the world, a majority does not enjoy such privileges. We must bear in mind the lowering of threshold of these screening and diagnosing technologies, so that they can benefit more people.” It is from this original aspiration that Alec found the motivation to develop and found “Mamosound”.

Science Enthusiast, PhD student, Entrepreneur

Belief is essential, and so is competence. While only 27, Alec has already completed three Bachelor of Science degrees in Biochemistry, Chemistry and Physiology. In 2014, he was awarded a scholarship to pursue his PhD in Biomedical Engineering at the Hong Kong University of Science and Technology (HKUST). He completed it in four years. Alec appears confident whenever he talks about his studies, the kind of confidence that could only be attained because he is dedicated and passionate about Science. His parents played an important role in this regard, “We used to go to the science museums, and were often out in nature when I was young. We would go hiking, hunting, and fishing. I used to disassemble things just to see what they look

在科大唸博士時，Alec比預期中快了一年完成他的論文，「如果你去問任何一個博士生，大部份人都會忙得不可開交，難以抽空創業。在很多比賽裡面，你都不會發現太多博士生參加。」Alec打趣說。因此，他多出整整一年時間可以做自己感興趣的事，於是他報讀商學院的課程，由於得知Good Seed這個項目，「在同一時間，我也有參與科大有另一個創業比賽，但Good Seed是第一個令我的想法真正成形的比賽。」Alec認為，Good Seed將不同背景、不同學院的人連繫一起，而他也是在這裡認識到Mamosound的另一位創辦人。

項目屢獲肯定 將擴展醫學科研

由2017年參與Good Seed起，Alec帶著Mamosound的意念參與大大小小的比賽和項目，不斷提案和演講。Mamosound不但獲選為數碼港培育計劃之一，還在科技大學——信

和百萬元創業大賽中獲獎。經過一年時間，他們終於成功建造Mamosound的原型，不用再紙上談兵，這是令他感到最興奮的一刻。目前，Mamosound的研發工作已大致完成，開始進入測試階段，例如已在印尼展開產品測試工作，並與紅十字會合作，為當地人作篩檢測試。

問及Mamosound在香港的發展動向，Alec表示，Mamosound有意擴展虛擬實境的醫療諮詢，還會在健康護理的物聯網(IoT)方面多作研究；同一時間，團隊亦會不斷改善Mamosound的數據庫，提高其準確度，令它可更順利地通過各地的產品測試。至於Alec自己，他目前已搬到美國華盛頓居住，一方面將繼續從事醫學科技產品的研究；另一方面，由於他在美國專利及商標局(USPTO)獲得一份全職工作，因此他會一邊工作一邊繼續走他的創業路。



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lowering the threshold for breast cancer screening, PhD student Bears Good

inside.” Alec laughs. “Why are leaves green? Why do they turn red in autumn? It is about being observant and asking a lot of questions. After all science is all about asking interesting questions.” Growing up in an environment that encourages observation, asking questions, and experimentation has molded Alec’s scientific mind of today.

While pursuing his PhD at the HKUST, Alec completed his dissertation a year earlier than expected. “If you ask any PhD candidate, most of them would be too busy to start a business. You don’t find too many PhD students in competitions as well.” Alec quips. As he ended up with an extra year to do things he was interested in, he enrolled in a business school program and there he learnt about Good Seed. “I was, participating in another entrepreneurship competition at HKUST at the same time. But Good Seed was the first a competition that allowed me to actualise my ideas.” Good Seed brings together people from different backgrounds and universities, Alec thinks. It is also where he met the future co-founder of “Mamosound”.

Repeatedly Receiving Recognition, Project Aims to Widen Scope of Development in Medical Research

Since his involvement with Good Seed in 2017, Alec has participated in competitions and projects of different scales, writing proposals and giving presentations about his idea of “Mamosound”. Not only was “Mamosound” selected as one

of the participants of the Cyberport Incubation Programme, it also won the HKUST-Sino One Million Dollar Entrepreneurship Competition. In one year’s time, they succeeded in building a prototype of “Mamosound”. Having their ideas actualised marked a new milestone for the team and is doubly encouraging for Alec. At the time of writing, Mamosound’s research and development work are almost completed and the device is now being tested. For instance, the product has been introduced in Indonesia for testing and the team has been collaborating with the Red Cross to run screening test for local people.

When asked about the vision of their development in Hong Kong, Alec told us about their plan to develop medical consultation using virtual reality and start researching on the Internet of Things (IoT) in health care. At the same time, efforts have also been made to improve Mamosound’s database to raise accuracy, so as to pass the product testing in different countries. As for Alec himself, he has since relocated to Washington, D.C., where he continues his research in medical technology products. Having been offered a full-time job at the U.S. Patent and Trademark Office (USPTO), he will continue on with his entrepreneurial journey in tandem with developing his career.