Dieter Chang – Founder, G-SYN, Taiwan

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G-SYN Biomedical Technology is a company dedicated to resolving problems occurring from cell hypoxia. Dieter Chang, the company's founder introduces the firm, why they decided to focus on hypoxia, their unique technology platform, and commercialization strategy.

Can you briefly introduce yourself and G-SYN to our international audience?

After Graduate school, I started working for a biotechnology company as a legal manager, pharmaceutical development manager, and special assistant to the Chairman of the Board. After this, I moved companies and began working as a General Manager for another biotech. Once I gained the relevant experience I decided to set up G-SYN in 2010. Initially, G-SYN was an ODM company for the design of dietary supplements and cosmetics, such as anti-allergy probiotics, wound healing cream and male infertility food supplements. However, I soon discovered hypoxia which I found to be an essential factor in maintaining health, therefore we shifted our focus toward the field of hypoxia and seeking resolutions for this. Subsequently, we have become a company whose main aim is to decrease the level of hypoxia in human beings. Therefore, we are focused on developing and constructing medical theories of hypoxia and producing medical products and services for this field.

Can you tell us more about cell hypoxia and why you decided to focus on this area in particular?

Cell hypoxia is one of the most important factors contributing to chronic diseases. As can be seen in the accompanying chart there are two factors to hypoxia: Firstly, reduced oxygen supply and secondly increased oxygen demand, these can cause three phenomena's: Increased toxins such as ROS and Lactate which lead to inflamed symptoms, increased energy consumption by anaerobic respiration which leads to clogged symptoms, and insufficient ATP which leads to cold symptoms.

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Thus, inflamed symptoms are risk factors for immune diseases and cancer, clogged symptoms are risk factors for cardiovascular and metabolic syndrome, and cold symptoms are risk factors for function diseases, and brain/nervous issues such as dementia. The phenomenon's caused by hypoxia further incur the aforementioned three body constitutions: Inflamed, clogged, and cold; anti-hypoxia can be an alternative to diseases incurred from above phenomenon and provide our consumers with an easy and efficient way to understand what happens to them and how the issues can be resolved.

Tell us about the bio-electromagnetism field medical field and its capabilities in resolving health issues stemming from cell hypoxia?

There is an abundance of research, ideas and there have been many attempts to defeat hypoxia, that is to say, to decrease the hypoxia level in the human body through mechanisms such as HAF (Hypoxia-Associated Factor), or the Anemia of Inflammation and the regeneration of mitochondrion. However, not much progress has been made or developed from these attempts.

Apart from modern western medical research, we had some ideas from traditional Chinese concepts, and have found Chinese Medicine theory to provide a solid introduction for possible resolution.Insufficient blood perfusion is one of the factors that cause cell hypoxia and it is illustrated from Chinese Medicine concept as ˋpoor Qi″. Therefore, we first hypothesized that Qi is the bio-electromagnetism signal to control blood perfusion. If we could enhance Qi, and adopt that bio-electromagnetism signal as the measure to enhance blood perfusion, then we can improve poor microcirculation by strengthening blood perfusion, and eventually decrease the level of

hypoxia. We therefore produced a RF IC Bio-Chip (referred as "Oxygener Bio-Chip") which launches a group of specific signals to enhance blood perfusion, and it is found that Oxygener Bio-Chip helps to repair micro-vascular and decrease the level of cell hypoxia significantly.

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Can you tell us about G-SYN's unique technology platform and product portfolio?

A prime example to illustrate the function of Oxygener Bio-Chip is animal experiments on type 2 diabetes mice. We know that the complications of diabetes are mainly caused by micro-vascular degeneration. Therefore, if the capillaries grow up and normalize, the nutrients and waste will be delivered and exchanged efficiently and sufficiently, and these complications can be reduced or mitigated. The animal experiment conducted by NARLabs (National Laboratory Animal Center) shows that the degenerative lesion of type 2 diabetes mice in internal organs such as liver, kidney, and digestive tract was lessened and mitigated after 21 days with Oxygener Bio-Chip attached on the bottom of the cage.

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A product that claims to enhance blood circulation is defined as a consumer product in Taiwan and China, instead of a medical device. Therefore, corresponding to the characteristics of the Oxygener biochip: non-oral and non-invasive, we have also installed the biochip into a wristband, so consumers may wear it 24 hours a day. The wristband functions systemically to normalize capillaries, which is unique and exclusive compared to other wearable devices in the market. So far, we have sold thousands of pieces. However, we would like to expand the application of the biochip to medical treatment, for distribution to Clinics and hospitals.

What does G-SYN offer patients through telemedicine and online expert services?

By 2020 the growth rate of chronic diseases will reach 57 percent. Furthermore, the health management industry, especially areas related to genetic testing and genetic regulation, are complicated and expensive. They lack accurate and effective treatment once test results have

been reported, and this makes it difficult to combine with daily healthcare self-management or to become universal. Moreover, it does not help the numerous patients suffering from chronic diseases that have limited financial capabilities. Therefore, an affordable, economical and practical method of health self-management for patients with chronic diseases is urgently needed. Unfortunately, the healthcare industry and the medical system cannot offer viable solutions at this time, due to the services either being too expensive or complicated.

If hypoxia is one of the major causes of chronic diseases, decreasing the level of hypoxia will be helpful for the prevention and treatment of these chronic diseases. Due to this, we set up an Oxygener Center dedicated to the research of medical pathology in the area of hypoxia. We aim to offer our consumers a new strategy of healthcare self-management to defeat hypoxia. Furthermore, we have set up an Online Expert system to provide both a questionnaire and a program which devises and produces a hypoxia test report, providing analysis and customized resolution for consumers.

What is your commercialization strategy for the creation of partnerships, penetrating the competitive wearable device market, and building an international presence?

G-SYN is a small company; however, we never limit ourselves in small things. On the contrary, we have developed from the fundamental medical theory in hypoxia, a new technology to resolve the issue of hypoxia, a new product to facilitate consumers to adopt the technology and a new service model to access consumers directly. The uniqueness, integrity, and name of the company help to construct a profitable business model. We utilize the Blue Ocean strategy which helps to attract enterprises who seek commercialization collaborations and are very open to new opportunities when they arise.

Furthermore, we have attempted to integrate the Oxygener Bio Chip with and incumbent detective wearable device, combined with our Online Expert system, which would enable us to provide a product that combines **“inspection→analysis→advice→treatment”** as a multi-functional, non-oral, and non-invasive wearable medical device. However, due to our small capital and scale, it is difficult for us to sustain ourselves with these ambitious goals. Thus, we have begun seeking outside investment for further development, particularly with regard to supporting our medical devices application and clinical trials.

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What would you like to achieve over the next five years?

We are currently applying for the Oxygener Wrist band to have medical device status. If we achieve this goal, it will become a pioneer of electronic medicine within the information medicine field. I hope to accomplish this goal within three years!

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