

THE UROSARIO, WITH ITS FIRST COMPANY FOR SERVICES OF PREVENTIVE AND PREDICTIVE MEDICINE

Ergonovus is the first spin-off in incubation of the Universidad del Rosario. It is an initiative of research and technological development which changed into a business model with a strong potential in the Colombian and Latin American market. Juan Alberto Castillo, leader of the *Health, Cognition and Work Research Group* (GiSCYT, in its Spanish initials) of the Universidad del Rosario, explains that it offers technological and consulting services in preventive and predictive medicine to companies in industrial sectors like construction and manufacturing.

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Last year, the Universidad del Rosario, and particularly, the Laboratory of Ergonomics and Movement Analysis (the Ergo Motion-Lab) of the Universidad del Rosario's School of Medicine and Health Sciences, received some important news: Ergonovus had become the institution's first spin-off as it advanced from a scientific initiative to a business model at the service of others: In this case, at the service of workers and those who want to prevent the illnesses which people may have because of the work they do.

A spin-off is the name given to a company which is created through the knowledge and results of research: It usually enjoys in-



lectual property rights like trademarks and patents and it is formed in the ambit of universities and developed with their support. In addition, it is a potential source of new jobs and economic development.

That is what Ergonovus is. It is the result of the work which has been done by the Ergo-Motion Lab, the Laboratory of Ergonomics and Movement Analysis of the Rosario's School of Medicine, which, since 2010, has developed technologies for understanding and improving the working conditions of Colombians. This ergonomics laboratory, one of the most advanced in Colombia and the only one in Latin America which is part of a School of Medicine, is engaged in two lines of work: Research and consulting.

Both have yielded outstanding results and that is why the members of the laboratory, who are professionals in different disciplines (doctors, engineers, physiotherapists, designers and statisticians) decided to enter a competition for universities which develop ideas that have the possibility of turning into companies.

Due to its potential and innovative nature, Ergonovus was a winning candidate and then entered into a process of accel-

erating its research projects, which finished in 2018. It is now dealing with the challenge of forming the company and progressing from prototypes to portable devices which will be able to predict and prevent illnesses by examining the risk profile of the workers of a company.

The foundation of the company are portable, external (adhesive) devices which are fixed on the body of a worker in order to assess the worker's risk curves and predict the possible onset of illnesses in the skeletal muscular system of an individual and the health risks of the organization as a whole.

Juan Alberto Castillo, the coordinator of Ergo Motion-Lab, explains that the system works in a very simple way: During a working day, micro-devices (similar to the sensors of electrocardiograms) are installed under the clothing of the person, with the aim of recording, measuring and analyzing the move-

ment of segments of the person's body (like the neck, rotator cuff and lower back) while the person carries out his or her daily tasks.

The information registered by the sensors is transmitted to a cell phone or storage unit where it is processed by a software which analyzes the data. Finally, a trained doctor reviews it and presents his analysis. "Knowing what may happen to the workers and how to anticipate it is predictive, not corrective medicine," says Professor Castillo, who is also the leader of the *Health, Cognition and Work Research Group* (GiSCYT) of Ergo-Motion Lab.

A significant progress

The previous studies undertaken by the research team of Ergo Motion-Lab were the basis of the development of the devices and other services which Ergonovus now proudly offers to companies. For example, it was part of a project, which took place between 2007 and 2010 and was sponsored by the European Union, called *Training in Motion Analysis* (or "Trama") in which 12 institutions from Sweden, Italy, Belgium, Mexico, Chile and Colombia did studies of non-invasive motion analysis in order to provide doctors with crucial information about their patients. It also worked with the Karolinska Institute of Sweden, a research-led medical university, to develop a technology of its own.

The same happened with the consulting services of the laboratory, which began in 2010 with the Positiva labor risk insurance company. Their joint work has yielded information that has been important for the activities of the spin-off. For example, they found that such labor risk insurance companies focus their interventions on observations of the workers: They do not compile quantitative data, and, as Castillo points out, doctors often find it difficult to understand the complexity of the context in which people work, which heightens the chances of faulty diagnoses and treatments. Finally, two other circumstances burden the general health system. The first is that it does not adequately distinguish between ordinary and work-related health problems. One fact alone evidences this: A disorder as common as the carpal tunnel syndrome may lead to 20% of unnecessary surgeries.

In consulting, it was likewise found that most companies limit themselves to formulating plans and doing follow-ups that are only based on observation. A comparative study, done in 2012, of the 110 biggest Colombian companies which aim for a healthy workplace, discovered that 80% of them do not count on a structured system of secure health: In many cases, they do not keep accu-



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rate records or compile enough data or have executives who are specifically responsible for that area. That is, they focus on the plans but not their implementation. The strange thing is that while Colombia lagged behind other countries in implementing its system of labor security and does not have sufficient information about that field, it has better indicators than many industrialized countries which have been recording such data for a longer time.

Professor Castillo believes that one explanation may be that accidents and labor-related disorders are sub-reported. Added to that is the fact that Colombian workers tend to self-medicate or they fail to report accidents at work because they are afraid of losing their jobs or do not know how to claim their rights from the employer and the health system. What we do know is that this kind of knowledge has enabled the professionals at Ergonovus to obtain support for the conversion of their ideas into a company and they are now able to move from the prototypes to the manufacture of portable devices which are able to predict and prevent labor-related illnesses on the basis of risk profiles. ■

INTERESTING FINDINGS OF THE RESEARCHERS OF THE SPIN-OFF

The work team on the line of research of Ergo Motion-Lab, which contributed the ideas for creating the Ergonovus spin-off, have undertaken several studies which show interesting aspects of occupational health in Colombia:

A widely implemented strategy, breaks in the working day, does not fulfill its objective, since the employee assumes that he must speed up his jobs to make up for the time "lost" in the work break, a situation which, in the end, causes the stress that results from tiredness. The laboratory discovered this in a joint study with the Université de Lorraine (Nancy, France), whose aim was to create a device which measures the stress caused by certain tasks assigned to employees: This stress is linked to anxiety and depression.

While Colombia shows a 20% annual increase in workplace accidents and disabilities, the cost of around 7 billion pesos a year is only a rough estimate. After suffering such accidents or illnesses, Colombian workers face a very long process of rehabilitation, which, in many cases, leaves them with permanent disabilities.

The productive sectors with the most workplace health problems are construction, public administration, hydrocarbons and mining (from a study done with the Faculty of Economics).

The spinal column is the weak point of Colombian workers and there is an urgent need to pay more attention to this problem because the population of the country is aging. 60% of its workers are now older than 45 and a variety of factors like their low stature and problems of overweight, along with an inadequate protection from occupational risks, may lead to higher costs in the health system and society in general. As Professor Juan Castillo always tells his students: "Your health is a blank check which is signed when you are 25 and cashed when you are 50."

