

## The innovative project IC-Life presents the development of monitored heart bracelets to prevent sudden death in sport

[Cardiovascular and circulatory system](#), [Biotechnology kits](#), [Patient monitoring equipment](#), [Manufacture of biotech equipment](#), [Internet and information technologies](#)

The use of heart bracelets connected via ICT (Information and Communication Technologies) to a system of tracking and monitoring could prevent cases of sudden death in sports activities. It could also enable an early detection of cardiac abnormalities, the prevention of certain muscle injuries and the improvement in health care times to the athlete. The business project IC-Life, developed by the young entrepreneur from the Universitat Jaume I in Castelló Hugo Alberto Ferrer, has been awarded by the INCREA Chair of Innovation, Creativity and Learning with a second prize of the 9th Creativity and Innovation Awards 2011.

The possibility of sudden death can begin to take shape with cardiac abnormalities detectable until 60 minutes before cardiac arrest occurs. The use of these bracelets enables to control these anomalies, and other aspects such as cardiac abnormalities generated by the consumption of doping substances, thus improving the completeness and reducing the costs of today's sport controls.

IC-Life presents the development of a heart bracelet that enables real-time control of the pulse of both professional and amateur athletes, which can be controlled through a monitorization system. If an anomaly is detected, three simultaneous warning signals would be sent to the control monitor, to medical assistance in the sports facilities (if there is any), and to the nearest hospital or health facility, thus reducing to the minimum the response time. This period of time is basic since the four minutes after the cardiac arrest are considered vital to save the life of the person concerned. After this time, the chances of survival decrease and the possibilities of having long-term negative effects increase.

Hugo Alberto Ferrer, Bachelor in Business Administration and Master in Advanced Accounting and Financial Management from the UJI, with a specialization course in Entrepreneurship and Strategic Development of Innovative Companies, explains that the cost of the bracelets, the monitoring equipment and the necessary antennas would not exceed 20 000 euros, 'a reasonable cost and much lower, for example, than the € 180 000 necessary to undertake a weekly cardiovascular check-up to 25 football players, and what is more, it is an investment that would save lives'. The heart bracelets system can be applied to all kinds of sports activities involving a group of

people: from training and competing in different disciplines, to using it in public and private sports facilities.

Nowadays, the analytical methods to detect cardiac abnormalities go through stress testing with ECG and echocardiography, laboratory tests and genomic analysis to determine congenital diseases, and the last ones are quite expensive. Italy is the only country with a massive control program for nearly 30 years, which consists of performing electrocardiograms that have reduced by 89% the incidence of sudden death since its implementation.

Sudden death, as defined by the cardiologist Norberto Debbag, 'is that which occurs in a sudden and unexpected way within the first hour of symptom onset, in a supposedly healthy individual, as in the case of an athlete, thus making it more fearful'. The IC-Life project also includes Dr. Miguel Amor's considerations, who states that this death 'occurs more frequently in the afternoon, coinciding with those hours in which the sport takes place in the months that correspond to competition, and it is in close temporal relationship with the sport activity'. Estimations show that one in 200 000 athletes die each year in the world for sudden death.

In Spain, where more than 12 million people practice sport, the Federation of Sports Medicine is developing a National Registry of Accidental and Sudden Death in Athletes (MASD). Previous studies from the field of forensics indicate that from 1995 to 2001 occurred in Spain 61 cases of sudden death between the ages of 11 and 65 years, 59 of them being males and 2 females. The sports that were frequently involved are cycling (21), football (13) and gymnastics (5). In various published studies, sports more related to sudden death vary from one country to another. In the US, the highest risk sports are basketball and American football, with 68 and 76% of cases, respectively. In Ireland, the sports with more cases of sudden deaths were golf (31%) and Gaelic football (21.5%), while in Italy the most frequently involved sport was soccer (44.8%), followed at distance by basketball (10.2%).

After having developed the business plan based on his observation as a sportsman and entrepreneur of the need to prevent the risks of the sport practice, Hugo Alberto Ferrer explains that he has the support of members of the Provincial Hospital and General Hospital in Castelló, as well as the Science, Technology and Business Park from the UJI, Espaitec. However, aware of the difficulty of undertaking in the current financial situation, he continues seeking new partnerships between electronic engineering companies and technology centres or institutes that would enable to develop the system.