**MEMO/07/137**

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# Winners of the European Inventor of the Year 2007 awards

***An international jury has selected the winners of the European Inventor of the Year award from four different categories on the basis of outstanding technical inventions for which the European Patent Office granted a patent.***

## Category Industry: Dr. Franz Laermer and Andrea Urban

## (Robert Bosch GmbH, Stuttgart/Deutschland)

Dr. Franz Laermer and Andrea Urban of Robert Bosch GmbH adapted micro-process techniques, leading to improved manufacturability and triggering the commercial breakthrough of micro-machines. Their invention, widely known as the **"Bosch Process",** has made car safety devices, such as airbag sensors, affordable for everyone.

The process helps in the manufacture of tiny high-precision silicon sensors using plasma technology. The purpose of their invention was to etch deep microstructures with vertical sidewalls into silicon wafers at high speed and with great accuracy.

The etching process has been known for some 30 years in the world of microelectromechanical systems (MEMS). A common problem with etching deep into silicon was that the process also etched sideways, eating into the wall of the structure being created and resulting in distorted walls.

Laermer's method overcame the problem by using a fluorocarbon-based plasma to deposit an etch-resistant layer before taking a subsequent etch step. The technique allows you to etch down deeply in a well-defined manner.

Upon its debut, the technology enjoyed immediate success. The invention was patented in 1993 and first marketed by Bosch in the form of an airbag in 1997. The Bosch Process made it far cheaper to manufacture such safety devices, rendering them affordable for all cars, not just top of the range vehicles. The sensors are also used in other applications, for example, in mobile phones or laptops. The technology has affected practically all MEMS fields, from health applications (including DNA chips and disposable blood pressure sensors) to high-resolution ink jet printing heads.

## Category SMEs/Research: Dr. Catia Bastioli and team

## (Novamont S.p.a., Novara, Italy)

In 1989, Italians Catia Bastioli, Vittorio Bellotti, Luciano Del Giudice and Roberto Lombi invented biodegradable plastics - plastics that fall apart and turn into soil in three to eight weeks when thrown onto a regular compost heap. These biodegradable plastics are made of crops, and they reduce greenhouse gas emissions and the consumption of non-renewable resources.

Bio-plastics, which are based on insoluble starch, are renewable, recyclable and reusable and can be turned into a near infinite range of products, including shopping bags, disposable cups, sheet mulch and even car tires. Adding to the intrigue, bio-plastics are renewable, recyclable, and reusable.

Traditional plastics are dirty to produce, they use up oil, and they don't decompose naturally. Traditional plastics take 100 to 400 years to decompose, or, when burned, they emit toxic fumes.

The breakthrough came in 1992 when the city of Fürstenfeldbruck in southern Germany started to test the new so-called "Pneo bag". Until now, over 3,500 cities have followed suit.

What started out with just Catia Bastioli, Vittorio Bellotti, Luciano Del Giudice and Roberto Lombi, has evolved into a world-leading company in bio-plastics, with a turnover of € 50 million in 2006 and nearly 60 patents. The company employs some 120 people and invests some 30% of its resources into research and development, among them US outfitter Goodyear and Italy's largest farmers association Coldiretti.

## Category Non-European Countries: Joseph Vacca and team

## (Merck Research Laboratories, Westpoint/PA, USA)

American Scientist Joseph Vacca and his team consisting of Katharine Holloway, Bruce Dorsey, Randall Hungate and James Guare created the compound which would become Crixivan, a revolutionary treatment for patients with HIV.

Introduced to the market in 1996, Crixivan stops viral replication by inhibiting the activity of protease, an enzyme used by viruses to cleave nascent proteins for final assembly of new virons. The drug lowers the viral loads in patients with HIV and prevents the virus from developing into AIDS.

The invention may not have been the first HIV treatment, but the compound broke new ground by helping to significantly extend the lives of those suffering from the condition. On its release, Crixivan was unlike any other treatment on the market. It was original because it was able to attack a different viral target – the HIV protease.

The team knew that HIV could rapidly develop resistance to any single therapy, and so from the beginning HIV protease inhibitors were taken in a “cocktail” with other antiretroversial drugs as part of HAART (Highly Active AntiRetroviral Therapy). And the cocktail worked. In 1997, the number of AIDS-related deaths in the United States dropped by 47% according to the FDA, a significant decrease that came quickly after protease inhibitors were introduced to the market.

To this day, drugs such as Crixivan have made the lives of those facing the deadly disease HIV/AIDS much more liveable – and longer.

## Category Lifetime Achievement: Professor Marc Feldmann

## (Kennedy Institute of Rheumatology, London/GB)

Professor Marc Feldmann developed a treatment that helps millions of patients around the world.

With autoimmune diseases, the body's immune system is essentially fighting a battle against itself. A major breakthrough in stopping this battle came when Professor Marc Feldmann identified in the 1990s the process at work on a molecular level. In so doing, he came up with a highly successful cure. Professor Feldmann found out that molecules are responsible for cell communication, molecules known as cytokines.

Cytokines are normally released by diseased cells for the purpose of alerting the immune system to initiate a counter response. With autoimmune diseases, Feldmann discovered highly increased cytokine counts also existed around otherwise healthy cells. This explained the body's aggressive reaction in areas of arthritic inflammation around a patient's joints. In analysing inflamed tissue from patients with rheumatoid arthritis, Feldmann and his team found that not only one but in fact several kinds of cytokines were triggering inflammatory reactions in rheumatoid arthritis. Feldmann developed a treatment to block the production of all cytokines involved in inflammation. Special antibodies had emerged as the one-for-all cure that researchers had hoped for.

Professor Marc Feldmann patented the method in 1995, and his seminal conceptual advances have led to numerous new treatments for rheumatoid arthritis based on the blocking method in clinical practice. As a result, millions of patients have been treated successfully around the world. The findings on the role of cytokines in autoimmune disease were nothing short of revolutionary.

To find out more about the European Inventor of the Year 2007, see www.european-inventor.org