

# Research and development

The foundation of Givaudan's continued commercial success is a longstanding commitment to research and development programmes in both the Fragrance Division and the Flavour Division.

Creative and innovative programmes are a clear focus on the current and future needs of customers is essential for us to retain our competitive edge in the fragrance and flavour industry.

As part of these programmes, our scientists merge analytical precision with human sensory response in developing systems and technologies that help the business perform successfully in the market.

In 2010, Givaudan invested CHF 336 million in research and development, more than any other Company in the industry. This investment will allow us to deliver on short- and mid-term research initiatives. It also gives us an opportunity to invest in promising long-term programmes.

During the year, the Fragrance Division's global Research & Technology organisation focused on the discovery of new fragrance molecules and their applications in fine fragrances and consumer products, concentrating research resources and programmes in line with industry and consumer lifestyle trends.

The Science & Technology organisation of the Flavour Division continued its commitment to developing a strong programme which addressed business growth with a focused ingredient discovery pipeline, new process technologies and a creative approach to sensory science.

**R&D spend**  
in millions of Swiss francs

2010 – 336

2009 – 326

## Fragrance Division

During 2010, Fragrance Research & Technology worked to sustain a vibrant and relevant organisation in which innovation and discovery can thrive and reap rewards.

A review of the career structures within the technical functions of Givaudan revealed the need for a different approach in order to be commensurate with the experience and knowledge that is developed over a long career of dedicated research. The new Dual Career Ladder is specific to Research & Technology in Givaudan and reflects the value that the business places on technical understanding specific to fragrance, recognising that researchers generate value through expert knowledge.

Activity within Fragrance Research & Technology was repositioned under three pillars in 2010: Wellbeing, Hygiene and Delight. These three pillars provide focus for research activity and technology development to support consumer-perceptible benefits for fragrance. Together they provide a framework that encompasses the many and diverse areas of expertise within Givaudan.

## Well-being

The Sensory research team has developed multiple connections with academia to explore new fragrance benefits, aiming at determining methods and fragrance formulations to enhance mood and ultimately lead to consumer benefits such as improved sleep. The programme is in its early development phase and has already shown promising initial results.

On a day-to-day basis, Sensory Science continues to support the three business units of the Fragrance Division via its global network. Regional sensory teams in Singapore, São Paulo, Ridgedale (NJ), Paris and Ashford provide expertise in fragrance profile, longevity and odour masking properties to our business partners to support product claims.

## Hygiene

Our researchers have discovered gender differences in the composition of human sweat – a discovery that is now being utilised to refine fragrance design for deodorising and antiperspirant products.



**Fragrance ingredient design**

The latest findings from TecnoScent™, a collaboration between Givaudan and ChemCom SA, will radically change the way that future fragrance molecules are designed.

Screening of fragrance materials on several olfactory receptor cells simultaneously has verified that for every receptor there are odour molecules that are agonists and antagonists. This means that some materials will activate a receptor whilst others will shut it down.

The field of molecular olfaction is still young, but the new concepts being developed may be put in use already. The chemical processes in the human nose itself will define the design of fragrances and fragrance ingredients in the future.

This knowledge enables our fragrance development teams to create perfumes to specifically block, mask or even remove malodour from masculine or feminine sweat as we identify specific materials that work best for each gender. In the same arena our partnership with TecnoScent™ has identified routes for blocking the perception of malodour by nasal receptors – this discovery leads to the possibility of designing products to protect people from offensive odours that are inevitable in crowded areas, for example, or even to enable individuals to control what they smell.

**Delight**

The search for new ingredients for fragrance design remains the life blood of Givaudan and the ultimate quest for our research teams. Responding to the demands of the market today, however, our focus throughout 2010 has been to re-evaluate our current palette to identify how Research & Technology can support the macroeconomic climate and the sustainability of our industry. We are currently exploring innovative synthesis techniques of our lead ingredients to lower their cost and thus make them more accessible for use in developing markets.

On the discovery front, we have developed the first bio-converted Patchouli-like accord: Akigala. This material will open doors to new creative avenues for both masculine accords and signature feminine fragrances.

Two new captive ingredients were introduced to Givaudan perfumers in 2010: Cassyrane™ and Syllkolide™. Cassyrane™ is the first sulphur-free cassis top note and confers a very comfortable and pleasant character, whilst Syllkolide™ is a revolutionary musk. The latter is set to become a future classic musky note. It brings a modern musky backbone that is noticeable throughout a fragrance and combines wonderfully with the red fruit facets that characterise this ingredient.

Delivering fragrance at the key touch points of the product experience remains a key priority at Givaudan. Recent advances in polymer chemistry have helped us progress the performance of our lead technology, Mechacaps™ which is used in laundry products and fabric conditioners worldwide.

Last but not least, Givaudan is the key contributor from the fragrance industry to the development of in-vitro methods of testing ingredients for skin sensitisation. Our work was published this year and we hope this will set the standard for the industry as the 2013 ban on animal testing under the 7th amendment of the EU Cosmetic Directive draws closer. Our dedicated team in the Research & Technology hub in Dübendorf, Switzerland continues to lead research in this area.