



Enhancing beauty through science

“Ever since its creation by a researcher 100 years ago, the group has never stopped investing in research. For L’Oréal, there can be no innovative product without an advance in knowledge. Driven by this conviction, the group’s laboratories have constructed the largest scientific data base, drawing on the observation of beauty routines and the evaluation of product performances across the globe. L’Oréal Research is constantly anticipating regulations and consumption trends to turn them into competitive advantages. For many years, our researchers have been helping to eliminate animal testing by the use of reconstructed skin, supporting demand for natural products by analysing plant-based ingredients, and exploring the potential of the life sciences to imagine the beauty of the future: a beauty that will be active, personalised, and respectful of the planet.”

Jean-François Grollier
Executive Vice-President
Research and Development

100 YEARS ON, THE HAIR COLOURANT REVOLUTION

The L’Oréal adventure began in 1909 with the Société des teintures inoffensives pour cheveux. Hair colourants were the core business, and have remained so ever since. The century has been marked by L’Oréal’s hair colourant innovations, one every 10 years: new colours, respect for hair fibre, long-lasting colour, odour-free colourants... Over the last three years, the pace has accelerated. Replacing ammonia by a non-

aromatic base, L’Oréal invented odour-free colourants with Casting Crème Gloss. By diversifying its technology, L’Oréal created a twin-tone colourant, with application time cut from 40 to 10 minutes, marketed as Excell 10’. Constantly listening to consumers and professionals is always a source of innovation. L’Oréal thus developed Rubilane®, an unprecedented 3D molecular structure which opens up a previously inaccessible spectrum of colour: deep copper reds, longer lasting with remarkably high performances. The genius of a dozen

Rubilane®: a passion for colour

80% of the world’s population has dark hair, making grey hairs immediately visible. To cover grey hair or change its colour, women and men want a colourant with warm, deep tones which is also long-lasting. For them, L’Oréal laboratories have developed Rubilane®, the result of five years of research and a thousand head tests in Europe, the United States, Latin America and Asia. Its 3D structure, the only one of its type in oxidation hair colourants, provides

three essential qualities. Intense, very deep and highly luminous tones, particularly in the reds, and perfectly uniform colour from root to tip from the first application, which is shampoo-resistant over time and maintains its original tone. Ten tones are available in 2008 from L’ORÉAL PROFESSIONNEL in the copper, copper-red, red-copper and red tints, in cream or gel-cream formulas.



08 highlights

Japan: creation of a high technology department.

China: creation of a biology and reconstructed skin unit.

Brazil: creation of a research and development unit in Rio de Janeiro.

France: creation of two laboratories, specialising in ecotoxicity and high-throughput performance evaluation of new active ingredients.

Europe: at the end of 2008, L'Oréal pre-registered all its chemical substances covered by European REACH regulations (Registration, Evaluation, Authorisation and Restriction of Chemicals).

researchers, and thousands of head tests on several continents, make this new generation of colourants a sure winner when it comes to haircare innovation.

THE ODYSSEY OF NATURAL COSMETICS

In 2007, L'Oréal created a natural and organic cosmetics expertise unit. With cosmetics expertise, its powerful analysis and evaluation methods, and the know-how of its formulators, L'Oréal has everything it requires to demonstrate the efficacy of natural cosmetics and develop concepts that would be inaccessible today using conventional chemistry.

A natural substance can include around a hundred ingredients which no conventional formula could contain. Even at a very low

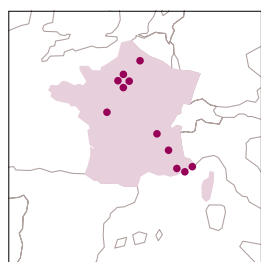
dose, these substances are highly effective, enabling minimalist formulation for maximum efficacy. Some sustainably developed essential oils turn out to be more effective than certain standard conventional ingredients, and thus enable self-protecting formulas.

These initial advances, which will be introduced into the SANOFLORE, THE BODY SHOP and GARNIER brands, are just the first signs of a new kind of cosmetics which will reveal the full extent of its performances and its ability to meet aspirations for naturalness and efficacy.

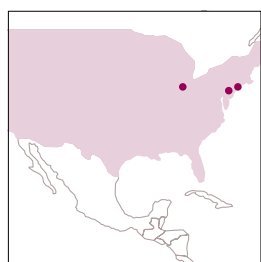


Demonstrating the efficacy of natural and organic cosmetics ingredients is a key objective.

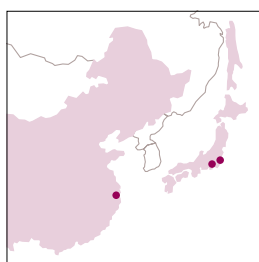
COSMETICS AND DERMATOLOGICAL RESEARCH CENTRES WORLDWIDE



11 IN FRANCE
Chevilly-Larue, Clichy (2 centres), Tours, Aulnay, Lyon, Sophia Antipolis, Monaco, Nice, Gigors-et-Lozeron, Lassigny



3 IN THE UNITED STATES
Clark, Chicago, Princeton



3 IN ASIA
Kawasaki, Tokyo (Japan) Pudong (China)



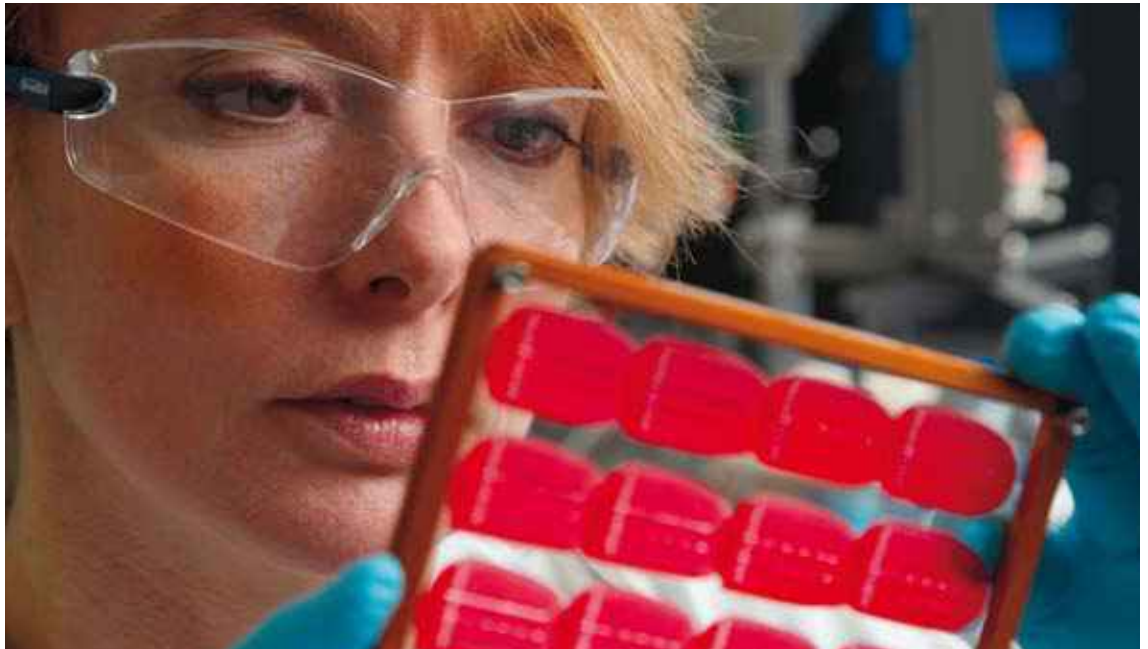
1 IN LATIN AMERICA
Rio de Janeiro (Brazil)

Gloss reflects researchers' perseverance

Designing a lipstick means meeting three key requirements which at first sight seem incompatible: a lipstick must be glossy, long-lasting and comfortable. How can a film be applied to the lips which is strong enough to be long-lasting, supple enough to be comfortable without vanishing the moment one eats something, and smooth enough to be glossy? The answer: a family of polymers, invented by L'Oréal's teams in collaboration with university researchers and suppliers, the culmination of research which began in 2001, protected by more than 20 patents. The polymers' pendant-necklace structure means that the pendants adhere to the lip, making the lipstick long-lasting, while preserving elasticity, suppleness and comfort on the lips. The result: intense colour, extreme gloss, and a supple, highly resistant film which lasts for 12 hours. A gloss with intense colours whose formulation had been impossible up to now without the risk of the lipstick bleeding.



Screening raw materials for efficacy by means of physical (shown opposite) and biological criteria.



COSMETICS INSTRUMENTS— THE PROMISE OF EFFICACY

Going beyond conventional applicators, L'Oréal is exploring types of packaging and applicators which will add to the potential of formulas, for example by the use of energy. A massage, a temperature difference or a vibration can stimulate skin cells, smooth out circles around the eyes, or help apply the product exactly where it is needed. The initial results are conclusive. GARNIER Eye Roll-on uses both mechanical energy (roller massage) and thermal energy (cold metal roller). The brand new Ôscillation mascara from LANCÔME uses micro-oscillation to spread the product evenly and separate the lashes. These two innovations came as a great surprise, and were a runaway success. Today, L'Oréal is inventing cosmetics instruments while continuing its research into instrumental cosmetics, which is closer to medical processes such as laser peeling, wrinkle fillers or injections.

THE "BEAUTYOMICS" AND ETHICAL BEAUTY OF TOMORROW

Cellular and then molecular biology has enabled researchers to study the skin and hair as living organs, made up of cells whose functions change under the effect of ageing, stress and the environment. The advent of "omic" tools, such as transcriptomics and proteomics, has thrown a new and expert light on to ageing, hair loss and skin repair or regeneration. The work of L'Oréal researchers on the skin genes involved in ageing has already paid off. It has enabled the decoding of a family of proteins which have a discriminating signature for skin youthfulness, and the selection of active ingredients which can re-express youthful characteristics. Another team has succeeded in enriching or impoverishing *in vitro* an epidermis of stem cells to correct the damage caused by the effects of sun or age. The first new generation anti-ageing skincare products are being launched at the start of 2009.

Work of this type requires a strict ethical approach: the aim here is absolutely not to modify the genetic code or play with variations in the expression of genes, but instead to understand the result of the activity of our genes on beauty.

These ethical considerations are also reflected in the group's commitment not to use laboratory animals to evaluate the harmlessness of products, and not to affect the well-being of future generations, by adopting an eco-design approach.

In the evaluation of raw materials, the absence of environmental impact is a priority.



Anti-ageing: a new approach to research

The beauty of the skin, its youthfulness, how it ages, and its ability to protect itself against stress and aggressions are largely linked to the genetic heritage of each individual. In collaboration with internationally renowned teams in France and Canada, L'Oréal's researchers have made use of the tools of modern biology to throw light on to the molecular targets of skin ageing. In the process, they have discovered that youthful skin and aged skin have specific protein signatures, and that these signatures change with age and when subjected to stress. These results have enabled them to select active ingredients which are conducive to the

expression of youthfulness in skin by acting on the proteins at the surface of the epidermis, which are produced by the activity of the genes. L'Oréal researchers were then able to select active ingredients which have an action on this family of proteins. The power of these "omic" tools has made it possible to prove their efficacy conclusively without using biopsies or other invasive techniques. Several active compounds have already been evaluated using these techniques, and will be included in the formulation of a new generation of anti-ageing skincare products.



Modern biological tools can conclusively demonstrate the efficacy of cosmetics.

Innovating by controlling the impact products have on the planet

INVENTING A CENTURY OF BEAUTY

From March 2009, the European Cosmetics Directive prohibits the sale in Europe of cosmetics products whose ingredients have been subjected to certain types of animal testing. This prohibition will apply to all tests in 2013. To guarantee its ability to innovate without making any safety concessions, L'Oréal Research anticipated this trend 30 years ago, by developing a safety evaluation strategy based on predictive approaches. They are based on data heritage built up over the past 100 years: a thorough knowledge of ingredients, the results of tests conducted up to now, the development of *in vitro* tools (based on cell culture) and *in silico* tools (statistical models used to predict a toxicological profile from a chemical structure), the correlations established between all these results and clinical studies or "Post-Marketing Surveillance", the sharing of data with the group's suppliers and players from all other industries as part of European partnerships, and above all scientific advances.

These approaches are predictive of safety, but also of efficacy, and this is their strength when it comes to guaranteeing innovation. For the 2013 deadline, the cosmetics industry is working with great determination alongside the whole range of industrial sec-

tors, and the European Commission, which plans to take stock in 2011 of the progress made by research in this area.

To control the impact of products on the planet, the L'Oréal laboratories have put in place an eco-design approach which incorporates—from the ingredient selection stage—indicators about the traceability of ingredients, what happens to them in water and air, and their impact on biodiversity. Suppliers of raw materials are involved in this process, and are required to comply with naturalness criteria from the ingredient

design stage. More than 15 years ago, L'Oréal's researchers carried out the first ecotoxicity studies with scientific experts across the globe. In 2008, the group created a laboratory specialising in ecotoxicity at Aulnay-sous-Bois (France), which also uses predictive methods to evaluate impact on ecosystems.

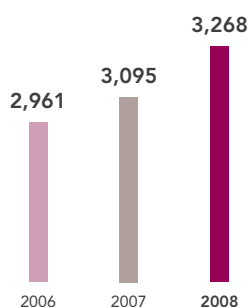
In a changing world, thanks to advances in knowledge, beauty is being invented in the laboratories of L'Oréal, as it listens to consumers all over the world.



Medaka fish eggs are a model for evaluating environmental harmlessness.

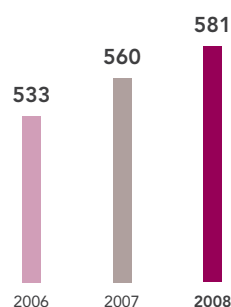
COSMETICS AND DERMATOLOGICAL RESEARCH EMPLOYEES

(including 50% of Galderma research employees)



RESEARCH AND DEVELOPMENT BUDGET

(€ millions, including 50% of Galderma research expenses)



NUMBER OF PATENTS

(cosmetics and dermatological research)

