Science Needs Women

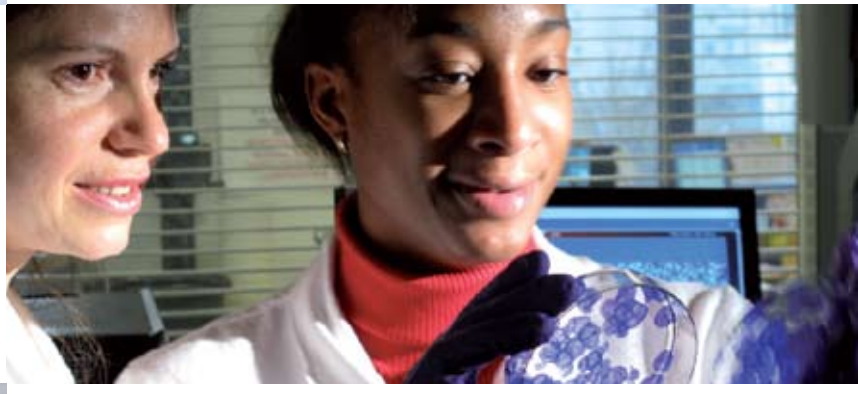
FOR WOMEN IN SCIENCE

United Nations
Educational, Scientific and
Cultural Organization

L'ORÉAL
FONDATION
D'ENTREPRISE

2010 EDITION

Index



UNESCO and the L'Oréal Foundation **Shared Commitment** to the Cause of Women in Science

Irina Bokova,
Director-General of UNESCO

Gender inequality is a serious infringement of human rights. It also hampers economic growth, threatens public health and helps destroy the environment.

In my eyes, the L'Oréal-UNESCO For Women in Science partnership is an innovative alliance capable of making a concrete contribution to the quest for gender equality. Through its Awards, the partnership highlights women of excellence and creates role models for young women around the world. This is brilliantly illustrated by our two Laureates who were awarded Nobel Prizes this year. Through international and national scholarships, the programme also encourages young women on all continents to pursue scientific careers and make their dreams come true.

This partnership promotes not only women. By highlighting the role women must play in scientific research, the programme emphasises the importance of science as a source of progress. My commitment to science is total. It is my conviction that science must serve humanity and respond to the numerous, urgent challenges facing us today.

I would like to stress another very strong message of the partnership. Spanning five continents, it helps promote the diversity of scientific research, the diversification of career paths open to women and the recognition of every kind of talent. I am especially aware of its impact in the developing countries, particularly in Africa, another of UNESCO's priorities.

Convinced that a globalised world needs to be governed by universal ethics, I envisage for UNESCO a new vision that I call "a new humanism for the 21st century". It is from this perspective that I will continue to work with conviction and firmness to pursue and develop the outstanding For Women in Science programme alongside the L'Oréal Foundation.

Sir Lindsay Owen-Jones,
Chairman of L'Oréal
Chairman of the L'Oréal Foundation

For twelve years now, the L'Oréal-UNESCO For Women in Science Programme has pursued its goals with passion across five continents. Its mission is to identify, reward, encourage and highlight exceptional women scientists. Women who, by their accomplishments and achievements, can serve as a model for younger scientists. But also women showing great promise, who still have their careers in front of them. All these scientists coming from every part of the world and tackling a vast range of different challenges, have much in common: absolute commitment, the courage to overcome obstacles and an enthusiasm that is grounded in hope.

This major and worthwhile cause now mobilises nearly all of our subsidiaries, and we are proud of their involvement. They are our antennae and the standard bearers for the programme around the world.

Our partnership with UNESCO, to which each partner has brought its vision, its expertise and its aspirations, is a model of complementarity and effectiveness. The appointment of Irina Bokova to lead this major institution will, no doubt, further enrich and energise it. Her radical concept of a "new humanism for the 21st century" puts the promotion of women in science at the top of her priorities. More than ever, our combined commitment will bring life to this project.

Every year we are proud to see the For Women In Science community expand and spread around the world. It can have real influence on science today and give it a new face, one that reflects the major challenges of our time.

Our Laureates are our beacons and the fact that two of them won a 2009 Nobel Prize is a great honour and a significant victory for our programme. They will join the ranks of those who light the way for others.

Our ambition: to distinguish exceptional women in science who are helping to change the world

The importance of honouring women scientists

More than ever, the world seems to be in a state of emergency: from the depletion of our natural resources to malnutrition, epidemics and natural disasters, the time has come to act.

For the past twelve years, L'Oréal and UNESCO have taken the initiative to bring together women whose research contributes to changing the world. These top-ranking scientists embrace global challenges ranging from health and the environment to social actions, and represent the key to the future.

Yet the role of women in science still needs to be defended. At the global level, women hold over half of university degrees, but only 30% are in the sciences or technology. In the United States, a recent study by the Center for American Progress shows that a woman scientist with a Ph.D., married with children, has a 35% lower chance of being granted tenure than a man with the same family situation.

Paradoxically, according to a 2009 TNS Sofres survey conducted in 10 countries in partnership with the L'Oréal Foundation and UNESCO, 84% of respondents esteem that science lies at the heart of their daily life.

[1] She Figures, 2009.

More than ever, an essential commitment

Through the For Women in Science programme, L'Oréal and UNESCO have worked together for the past twelve years to promote the cause of women in science. Each year, the programme highlights scientific excellence and encourages young women to pursue scientific careers.

For many young researchers, the programme today represents an invaluable source of motivation and inspiration.

Recently, Professors **Elizabeth Blackburn** and **Ada Yonath**, both 2008 Laureates of the L'Oréal-UNESCO Awards For Women in Science, were awarded the **Nobel Prize, in Medicine** and **Chemistry** respectively. Recognition of the scientific excellence of these women by such a prestigious institution provides enormous encouragement for the future of the L'Oréal Foundation and UNESCO partnership.

Removing the doubts of young women

Elizabeth **Blackburn**

2008 Awards Laureate for North America
and 2009 Nobel Prize in Medicine

"I see the difficulty for girls who are thinking about a career in science: they love the science and they feel daunted at the same time. How can we give them the confidence and the tools to deal with things that may deflect them from the careers they want?"

The importance of encouraging the careers of young women in science

Ada **Yonath**

2008 Awards Laureate for Europe and 2009 Nobel Prize in Chemistry

"Although young women are taking classes in science, only a few of them take it to the next step and the next and the next. And once girls have chosen to pursue scientific careers, they need more than just financial support for their studies - they also need support to participate in international meetings and pursue opportunities that lead to the exchange of ideas and to experiences."

Wherever science is practiced, the L'Oréal Foundation and UNESCO are committed to supporting women in science:

Each year, 5 eminent women scientists are honoured, one per continent, for their outstanding scientific contributions and commitment.
Each year, Fellowships are awarded to budding scientists to encourage them to develop their talent. Over the past twelve years, nearly 1000 women have been recognised: 62 Laureates from 28 countries - 864 Fellows in 93 countries.

The 2010 Laureates:
5 women,
5 major contributions,
5 global challenges

PROFESSOR

Rashika **El Ridi**

Egypt Laureate for Africa and the Arab States

PROFESSOR

Lourdes **J.Cruz**

Philippines Laureate for Asia and Pacific

PROFESSOR

Anne **Dejean-Assémat**

France Laureate for Europe

A commitment to scientific excellence
President of the Awards Jury **Günter Blobel**, Nobel Prize in Medicine 1999

When we are composing the jury, we look for eminent individuals specialised in all the different fields of biology, who have complementary expertise. It is also important that the jury members be involved in or aware of new areas of research. The jury members are also very active and involved in science in their continent and understand that continent's research conditions, so that they can help us in the identification and evaluation of the nominees from the region.

The biggest challenge for the jury is to ensure that the very best women are nominated, and selected solely upon merit. As President of the Jury, I'm particularly committed to making sure that the slate of nominees is really the very best. The recognition that comes with the L'Oréal-UNESCO Award is important, especially for women in developing countries; clearly it's much easier to do science if you have wonderful labs and tremendous support.

PROFESSOR

Alejandra **Bravo**

Mexico Laureate for Latin America

PROFESSOR

Elaine **Fuchs**

USA Laureate for North America

Pr. Rashika El Ridi

Laureate for Africa and the Arab States

For paving the way towards the development of a vaccine against the tropical parasitic disease bilharzia which affects over 200 million people.

Her quest: to discover a vaccine

Schistosomiasis, also known as bilharzia or “snail fever”, is a chronic parasitic disease that can be particularly severe in children. It facilitates co-infection by malaria, tuberculosis and viruses like AIDS and hepatitis.
Socio-economically, schistosomiasis is the second most devastating epidemic in the world after malaria, with 280,000 deaths a year. It is mainly found in Sub-Saharan Africa, which accounts for 85% of cases, and to a lesser extent in Asia and Latin America.
Professor El Ridi has devoted a large part of her research to understanding the biology of this parasite and the immune responses that can be stimulated in humans, in order to create an effective vaccine. She helped reveal how the schistosome parasite survives in the lungs and why it is so hard for the immune system to eliminate it. Most importantly, she demonstrated how the immune system reacts strongly to several substances secreted by the parasite, which it uses to protect the body from new infections.

An inspiration for generations of young scientists

Professor Rashika El Ridi began as an expert in immunology with a specialisation in reptiles. Her research has since taken her towards the biology and immunobiology of schistosomiasis. Her discoveries directly led to the elaboration of a vaccine candidate for this highly debilitating disease.

For over thirty years, Professor El Ridi has been the mentor for dozens of students in Egypt, working relentlessly to find funding for their research. On the strength of her reputation and research, she managed to create and modernize the immunology laboratories at her university.

Her devotion to her students, her humanistic vision of scientific research and her special focus on a disease that profoundly undermines the quality of life in developing countries make her an inspiring model for all scientists.

A humanist in immunobiology

After winning a scholarship from the Egyptian government, Rashika El Ridi studied at the Czech Academy of Sciences in Prague, where she completed her Ph.D. in immunobiology in 1975. She was then named Assistant Professor in immunology at Cairo University, where she taught for the next five years.

Rashika El Ridi in her own words

Bringing relief to the world

"A schistosomiasis vaccine will help the world eradicate the parasite, as we did with the smallpox variola virus and the polio virus. We can reasonably expect to see the development of such a vaccine within the next five years," she declares.

A balanced professional and personal life

"A career in science requires energy spent on excellent work and taking excellent care of one's children and spouse," she comments. "Dedication and hard work will lead to fulfilment, a secure and respectable position, financial independence, happiness and peace."

PROFESSOR RASHIKA EL RIDI, Faculty of Sciences, Cairo University, Egypt.

Named Associate Professor in 1981 and full Professor in 1986, she served as the research director for numerous national and international projects and supervised over 60 masters theses and 30 doctoral theses.

Rashika El Ridi has received several prestigious awards including the Cairo University Outstanding Achievement Award in Applied Sciences in 2004. The university also gave her a Doctor of Science (D.Sc.) degree in recognition of her vital, ongoing contribution to scientific knowledge. In January 2010, Professor El Ridi was personally cited by Egyptian President Hosni Mubarak for the international recognition of her research.

A committed woman

"It is difficult for me to believe that we are about to reach the planet Mars and we are still unable to develop a decent vaccine against malaria, against schistosomiasis, against tuberculosis."

Pr. Lourdes J.Cruz

Laureate for Asia and the Pacific

For the discovery of conotoxins produced by certain marine snails that can serve as painkillers and pharmaceutical probes to study brain function.

A commitment to reducing pain

Highly prized by seashell connoisseurs, cone snails are marine gastropod molluscs that live in the shallow waters of tropical oceans. In seven out of ten cases, the venom of certain species can be fatal. Yet for researchers, venom is also seen as a kind of "chemical factory" in the natural world, and they are often used as a source of inspiration for research.

In the 1970s, Professor Cruz was one of the first to research the toxins of these marine snails. By elucidating the structure and functioning of conotoxins, she provided the medical world with some powerful tools for researching the nervous system. In medicine, these toxins serve as components for developing drugs to fight pain, epilepsy and other neurological disorders. For example, Prialt, a more powerful alternative to morphine but without the side effects, is used for the treatment of severe pain, particularly in patients with cancer or certain types of neuropathies. Another toxin, conantokin, is being studied for its potential as an anti-convulsive for treating epilepsy.

In addition to her devotion to laboratory work, Lourdes Cruz is also an active citizen committed to helping society. In 2001, she started the Rural Livelihood Incubator (Rural Linc) with the help of volunteers and private funding. Rural Linc strives to create jobs and fight poverty and socio-political instability over the long term in the rural areas of the Philippines.

From poison to medicine

Professor Cruz is an internationally recognized expert in marine toxicology and a specialist in cone snails (genus *Conus*). Living in tropical seas, these marine snails use their toxic venom to paralyse their prey: fish, marine worms and other snails.

Each type of venom contains roughly 100 to 200 different agents. With over 700 species of cone snails, conus venom is a real gold mine of over 100,000 neuroactive molecules.

Lourdes J. Cruz in her own words

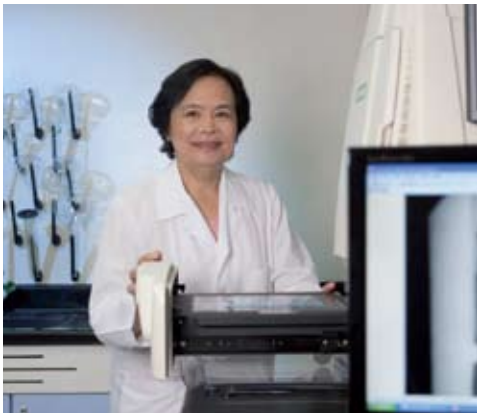
Biochemistry as a passport to the world

Lourdes J. Cruz is a biochemist at the Marine Science Institute of the University of the Philippines. In the United States, she received a Masters and Ph.D. in biochemistry from the University of Iowa. After working at the International Research Institute, an NGO in Los Baños, Philippines, in 1970 she began teaching biochemistry at the University of the Philippines.

First a citizen, then a researcher

"As a citizen of the Philippines, I am very concerned about the persistent high poverty level in rural areas, particularly among disadvantaged communities like the indigenous tribes, women farmers, and fisher folks."

"In 2001," she explains, "I established the Rural Livelihood Incubator program to try to mobilize science and technology to alleviate poverty." Determined to improve the lives of individuals in her community, she plans to use the L'Oréal-UNESCO Award money to buy a piece of land to serve as a new base for the Rural LINC program, and a site for the women's fruit processing facility that will preserve local heritage. "This project involves building a fruit processing facility run by women farmers, where the indigenous tribes can sell fruits from the orchards and forest trees."



PROFESSOR LOURDES J.CRUZ, Marine Science Institute, University of the Philippines Diliman, Quezon City, Philippines.

She was named professor in 1977 and chaired the university's biochemistry and molecular biology department from 1980 to 1986.
In 2006, she received the National Scientist Award, the Philippine government's highest distinction in recognition of outstanding scientific achievement.

In addition to publishing over 100 articles on her research, Professor Cruz has filed 13 patents in the US, and she recently presented a report on "Gender, Science and Technology in the Philippines".

A commitment to serving others every day

A woman and a scientist who never loses sight of the need to solve practical problems to improve people's lives, Lourdes Cruz is personally very active in addressing poverty in the Philippines: "After devoting all my time to a relatively productive scientific career, I asked myself what have I really done to help my country and my countrymen, particularly the poor communities?"

Pr. Anne Dejean-Assémat

Laureate for Europe

For the elucidation of the molecular and cellular mechanisms at the origin of certain cancers in humans.

An iron-willed fight against cancer

Each year nearly eight million people die from cancer worldwide. The disease can take numerous forms. One form is leukaemia, a cancer of the blood and of bone marrow, which affects about 250,000 people worldwide each year and causes about 4,000 deaths per year in France alone.

We urgently need to better understand the mechanisms of this disease. In the human body, normal cells become cancerous when they begin dividing uncontrollably. Although the causes are still a mystery, Professor Dejean-Assémat has helped discover new genetic factors associated with this transformation.

She was the first to demonstrate that in some cases the hepatitis B virus, by inserting its genome into that of the hepatic cell, can disrupt neighbouring human genes and directly trigger the development of liver cancer. In one case of liver cancer, she observed that viral insertion was carried out in a nearby new human gene that provides coding for a retinoic acid receptor, the active form of vitamin A.

Later, Anne Dejean-Assémat and her colleagues discovered that an alteration of this same gene was responsible for certain types of leukaemia, paving the way for new therapeutic prospects.

Toward new treatments

A molecular biologist, Professor Anne Dejean-Assémat has devoted her research to the molecular and cellular mechanisms involved in the development of human cancers. She has made considerable advances in understanding cancer and has opened up unique perspectives in developing new treatment procedures.

Anne Dejean-Assémat in her own words

An ambition that has guided her life

Born in France, Anne Dejean-Assémat studied at the Université Pierre et Marie Curie in Paris, where she earned her Ph.D. in 1983. Two years later she joined INSERM, the French National Institute for Health and Medical Research, and was appointed Research Director in 1991. Since 2003, she has directed the Laboratory of Nuclear Organisation and Oncogenesis at the Pasteur Institute, as well as the INSERM Research Unit of Molecular and Cellular Biology of Tumors.

A progressive family

Her parents' freedom of thought played a key role in shaping Anne Dejean-Assémat's career. Her mother was a mathematics professor and fought for women's rights, through France's Family Planning organisation. Her father, an engineer, was committed to saving the planet, through his work with a local environmental protection association. "They instilled in me their independence, their inclination to question things and to protest when necessary," she explains. "Our house was open to all, and evenings were filled with endless discussions. From this open environment, I developed a questioning mind, as well as combativeness. Although my parents are no longer living, they remain my role models, and my upbringing has reinforced my professional pursuits."

A profession under pressure

In her profession, she sees three types of pressures: "First, there is the esteem you have for your own work and the pressure you put on yourself."

PROFESSOR ANNE DEJEAN-ASSEMAT, Research Director INSERM, Pasteur Institute, Paris, France.

In 2004, she was elected to the French Academy of Sciences. She is also a member of the European Molecular Biology Organization (EMBO) and a corresponding member of the French Academy of Medicine.

Her international renown has brought her many prestigious awards, including the Hamdan Medicine Award in 2000 and Gagna & Van Heck in 2003.

As she sees it, evaluations are a second source of pressure. "We are constantly evaluated by our peers: when publishing articles, through repeated grant applications, when seeking scholarships for our students, and when creating and maintaining research facilities. Moreover, we are always faced with urgent deadlines."
The third source of pressure is the permanent challenge of international competition. "At some point, you must be able to say to yourself that your competitors do not necessarily know more than you do, and then just focus on your research!"

The future of the world lies in knowledge and in research

"The world seems to be taking notice that 'all-consumerism' and the race for results represents a real threat to our planet's equilibrium. Now we're pausing to think about re-establishing an ideal. The issue that matters most at this moment is continuing the quest for knowledge, for the good of our planet and its inhabitants. Non-programmed, non-channelled, fundamental research represents a country's future, and its scientists are a resource that must not be wasted."

Pr. Alejandra Bravo

Laureate for Latin America

For her understanding of the mechanism of a bacterial toxin that acts as an environmentally friendly insecticide.

Toward eco-responsible agriculture

Sometimes harmful to agriculture, insects also play a role in spreading human diseases. They often go hand in hand with famine and malaria, which remain two major issues for human populations today: around the world, someone dies of hunger every 4 seconds and 2.37 billion people suffer from malaria.

The only answer has been to spray chemicals to control insect populations. These chemicals are not only toxic, they also remain in the environment for long periods.

Alejandra Bravo set out to discover the mechanism of action of the insecticidal proteins produced by a bacterium - Bacillus thuringiensis, Bt – which, unlike chemical products, pose no danger to humans, animals or the environment. Due to the widespread use of Bt toxins, certain insect species have developed resistance to them. This adaptation looms as the biggest threat to the fight against parasites in the cultivation of cotton, corn and rice. Professor Bravo and her team have been able to develop Bt toxins capable of thwarting insects' resistance.

Considering the toxicity of certain pesticides, these Bt toxins offer a particularly attractive alternative, a "green" alternative.

Bio-pesticides to control insect pests

Internationally renowned biologist Alejandra Bravo is working to show how toxins derived naturally from certain bacteria can be used as biopesticides, an ecological way to control insect pests.

As a young researcher, Alejandra Bravo was asked to create a Bt lab from scratch at her university. Starting with an empty room and no equipment, she realised that she needed to learn more on the ground.

To do so, she spent a year at a company in Belgium that is one of the leaders in explaining the mechanism of action of Bt insecticide proteins.

Once back in Mexico, with the help of a small but devoted team, she was finally able to create a top-notch laboratory. Her first decision was to build a collection of Bt bacteria extracted from Mexican soil samples.

From Mexico to Europe and back, a "green" orientation

Professor Alejandra Bravo works in the Molecular Microbiology Department of the Biotechnology Institute located in Cuernavaca. The Institute is part of the National Autonomous University of Mexico (UNAM).

After earning a Bachelor's degree in microbiology and a Ph.D. in biochemistry, she was hired as a professor in 1989. She twice received grants to conduct postdoctoral work in Europe: in entomology in Belgium in 1991 and in genetics at the Pasteur Institute in Paris in 1995.

Professor Bravo has authored numerous scientific publications, and her articles have appeared in prestigious journals, such as Science. She has been awarded several national and international distinctions. She has played an active role in developing biotechnologies in the agricultural field in Latin America and served as an enthusiastic teacher to young researchers.

Alejandra Bravo in her own words

Finding freedom in molecular biology

As a young girl, Alejandra Bravo had two dreams: to be a grandmother and a doctor. Early on she developed a liking for biology and chemistry that led her to be one of the first candidates for the brand new Biomedical Research programme offered by UNAM. "The selection procedure was quite hard because they only accepted 10 students per year at that time." Thus, since the age of 19 she has been leading research projects at a university that is very dear to her. "I had the best teachers and the best opportunities to develop all my potential."

Global warming, an urgent cause

Alejandra Bravo believes that the rapid progress of technology in science should be harnessed to diagnose and prevent disease and counteract emerging bacteria, viruses and insect pests. "Sequencing the human genome took more than 13 years; today we can accomplish the same amount of work in a matter of months or weeks. Genomics, proteomics and other technologies have changed the way we do research."

PROFESSOR ALEJANDRA BRAVO, Institute of Biotechnology, Universidad Nacional Autonoma de Mexico, Cuernavaca, Mexico.

In the future, she explains, global warming will lead to the development of new insect pests and epidemic diseases: "We need to improve science to counteract these problems because they affect food production and health."

Determination that never fails

Through hard work and patience, Alejandra Bravo and her team unravelled the step-by-step process by which insecticidal proteins produced by *Bacillus thuringiensis* (Bt) bacteria kill their targets. "The bacteria *Bacillus thuringiensis* (Bt) was a new area of study, on which no other person at the National University of Mexico (UNAM) had worked before," she explains. "I spent one year in Belgium at a company that was the leader in the field. By 1992, I felt that I had become an expert in the study of Bt proteins and their application as bioinsecticides compatible with the environment."

Pr. Elaine Fuchs

Laureate for North America

For the discovery of stem cells and key processes involved in skin development, maintenance and repair.

Understanding stem cells to better treat skin disease

The skin is remarkable in many respects: not only is it the largest organ of the human body, measuring around 2m² and 5kg, it also acts as a vast immune system. The same stem cells produce two very distinct structures: our skin surface (the epidermis) and hair. Scientists are thus faced with the question of what biological process determines whether a cell becomes epidermis or hair.

Professor Elaine Fuchs was the first to precisely describe keratins, skin cells' principal protein structures, and to identify a certain number of skin disorders that result from them.

She pioneered a new method to determine the genetic basis of human diseases. Her first application was in elucidating the genetic basis of epidermolysis bullosa simplex (EBS) in humans. Around 40,000 individuals suffer from the disease worldwide. Within a year, she had also elucidated the genetic basis of another blistering skin disease in humans. In total, her research on EBS has helped identify more than 20 hereditary diseases and their proteins, all from the same family as keratins. Her recent applications of this "reverse genetic approach" have extended to human cancers.

Furthermore, her considerable body of work has revolutionised the scientific approach to skin stem cells, which make it possible to reverse hair loss or regenerate the cells of the epidermis.

Today, she aims to push still further in the exploration of the extraordinary characteristics of stem cells because they offer tremendous promise in the field of regenerative medicine.

The key to the mysteries of stem cells

Fascinated by skin and hair, Professor Fuchs is at the leading edge of cutaneous biology and genetic skin disorders, including cancers.

By questioning how tissue structures as different as the epidermis and hair follicles could develop from the same initial stem cell, she has made a priceless contribution to our understanding of the mammalian skin biology.

Skin as her focal point

Elaine Fuchs grew up near Chicago and earned her Bachelor's degree in 1972 from the University of Illinois. In 1977 she completed her Ph.D. in biochemistry at Princeton University and began postdoctoral work with Howard Green at the Massachusetts Institute of Technology (MIT). Elaine Fuchs joined the faculty of the University of Chicago in 1980. Since 1988 she has been a Howard Hughes Medical Institute Investigator, and since 2002, a professor at The Rockefeller University in New York City, where she directs the Laboratory of Mammalian Cell Biology and Development.

Professor Fuchs has received numerous awards and distinctions. In 1994 she was elected to the National Academy of Sciences Institute of Medicine and the American Academy of Arts and Sciences, and in 2005 to the American Philosophical Society. In 2009 she was awarded the National Medal of Science, which was presented by President Barack Obama.

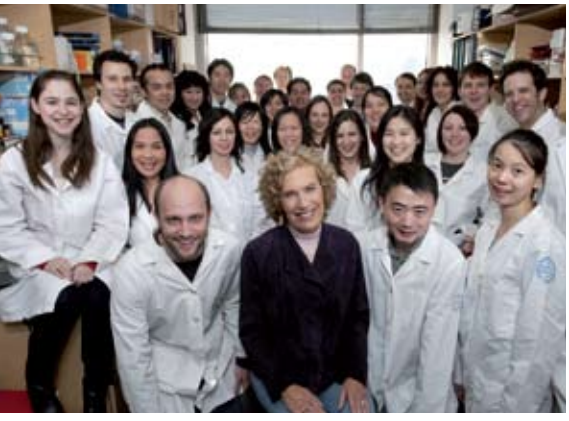
Elaine Fuchs in her own words

Inspired by exemplary women

Her father was a geochemist and wanted her to be a teacher, but the women around her encouraged her to aim higher: "My mom was a housewife but felt that I'd make a fine chemist because I was a good cook. She strongly encouraged me. My aunt, a biologist, was a feminist ahead of her time, and she served as an excellent role model, as did my older sister, who is now a neuroscientist."

A supporter of gender equality

Her first challenge was a political one: as a tenured professor at the University of Chicago, she discovered that she was being paid less than the starting salary for a male assistant professor in the same department. "All of a sudden, I was faced with an urgent need to rectify a situation where, minutes before, I had been happy with my salary, my position, and my university."



PROFESSOR ELAINE FUCHS, Laboratory of Cellular Biology, The Rockefeller University, New York, USA.

She thinks that in spite of enormous progress, there are still disparities between men and women in science: "This becomes increasingly obvious at the upper end of the achievement ladder, where fewer women are there to 'remind' their male colleagues of the importance of not ignoring the scientific accomplishments of their female peers."

A new approach to research, with promising perspectives for cancer treatment

"In studying the stem cells of the skin, there is tremendous potential not only for regenerative medicine, but also for studying and developing new and improved treatments for poorly understood but devastating genetic disorders, including cancers."

L'Oréal-UNESCO INTERNATIONAL JURY, LIFE SCIENCES

AWARDS 2010

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Institute of Cellular and Molecular Pathology
Brussels, Belgium

PRESIDENT OF THE JURY

Professor Günter **Blobel**
Nobel Prize in Medicine, 1999
The Rockefeller University
New York, USA

HONORARY PRESIDENT

Irina **Bokova**
Director-General, UNESCO
(not pictured)

Africa

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Onesmo K. **Ole-Moiyoi**
Kenyatta University, International Centre for Insect Physiology and Ecology (ICIPE), Nairobi, Kenya

PROFESSOR
Nagwa **Meguid** (Laureate 2002)
Professor of Human Genetics,
National Research Center, Cairo, Egypt

PROFESSOR
Valerie **Mizrahi** (Laureate 2000)
Research Professor, University of the Witwatersrand, Johannesburg, South Africa

Asia-Pacific

PROFESSOR
Indira **Nath** (Laureate 2002)
Institute of Pathology (ICMR), Safdarjung Hospital Campus, New Delhi, India

PROFESSOR
Kiyoshi **Kurokawa**
Professor, National Graduate University of Policy Science, Professor Emeritus of the University of Tokyo, Japan

PROFESSOR
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Chair Professor and Head, Department of Biochemistry, Hong Kong University of Science and Technology, China

Europe

PROFESSOR
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PROFESSOR
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PROFESSOR
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Max Planck Institute of Biophysical Chemistry, Göttingen, Germany

PROFESSOR
Maciej J. **Nalecz** (for UNESCO)
Director, Division of Basic and Engineering Sciences, Natural Sciences Sector

DOCTOR
Jacques **Leclaire** (for L'Oréal)
Director, L'Oréal Life Sciences Research

Latin America

PROFESSOR
Gloria **Montenegro** (Laureate 1998)
Director of Research, Faculty of Agronomy and Forestry Sciences, Pontifical Catholic University of Santiago, Chile

PROFESSOR
Armando **Parodi**
President, Leloir Institute Foundation, Buenos Aires, Argentina

PROFESSOR
Mayana **Zatz** (Laureate 2001)
Professor of Genetics,
University of Sao Paulo, Brazil

North America

PROFESSOR
Joan **Steitz** (Laureate 2001)
Sterling Professor of Molecular Biophysics and Biochemistry, Yale University, USA

PROFESSOR
Jeffrey **Ravetch**
Theresa and Eugene Lang Professor, The Rockefeller University, NY, USA

UNESCO – L'Oréal International Fellows 2010

The Faces of Tomorrow's Science

1 FELLOW FROM COSTA RICA

FELLOW FROM COLOMBIA 2

3 FELLOW FROM PERU

6 FELLOW FROM SPAIN

FELLOW FROM GREECE 8

7 FELLOW FROM UKRAINE

5 FELLOW FROM MOROCCO

4 FELLOW FROM TUNISIA

9 FELLOW FROM EGYPT

FELLOW FROM CAMEROON 11

10 FELLOW FROM GABON

12 FELLOW FROM COMOROS

1. María Gabriela **Gei**
2. Diana Marcela **Bolaños Rodriguez**
3. Margoth Mitchela **Moreno Vigo**
4. Ghalia **Boubaker**
5. Nawal **Bouaynayne**
6. Maria-Teresa **Guardiola-Claramonte**
7. Svitlana **Yablonska**
8. Irene **Margiolaki**
9. Hadeer **El Dakhakhni**
10. Elisabeth **Lendoye**

FELLOW FROM INDIA 13

FELLOW FROM MALAYSIA 15

FELLOW FROM SINGAPORE 14

International Fellowships: The Selection Process

Each year, 15 International Fellowships are granted to young doctoral or post-doctoral researchers in the Life Sciences, whose projects have been accepted by renowned research laboratories outside of their country of origin.

Three researchers are selected from each of the following regions: Africa, Latin America & the Caribbean, Asia & the Pacific, Arab States, and Europe & North America. Following a pre-selection by UNESCO National Commissions, the top four candidates from each country are nominated and presented to the Fellowship Section at UNESCO in Paris. The final selection of the 15 recipients is then made by the UNESCO-L'Oréal Fellowship Selection Committee.

11. Marietta Solange **Soupi Nkeutcha**
12. Djoudi **Roukia**
13. Antima **Gupta**
14. Marissa **Teo**
15. Yifen **Tan**



ENVIRONMENTAL PROTECTION AND PRESERVATION OF NATURAL RESOURCES

María Gabriela **Gei**

COSTA RICA

Host Institution: Department of Ecology, Evolution and Behavior, University of Minnesota, USA

Plant Ecology

Costa Rica ranks fifth among countries committed to environmental protection, ahead of France (10th) and the United States (39th)[2]. With 161 national parks, reserves and natural spaces, nearly 26% of Costa Rica's land is protected.

These are the perfect conditions to attract scientists like María Gabriela, who is studying a type of legume from the pea family (Fabaceae family). This economically attractive species provides a source of vegetal protein for animal or human consumption that does not require nitrogen fertilizer. Its root nodules fix atmospheric nitrogen through symbiosis with rhizobia, which are nitrogen-fixing bacteria.

María Gabriela's goal is to test these plants' contribution to soil regeneration. She would like to purchase some land in one of Costa Rica's dry forests, which are veritable carbon sinks, and study the nutrient cycle and the extent to which plant interactions with the microbial community in the soil depend on the presence of legumes. In a best-case scenario, these legumes would enrich the soil and favour plant growth around them. By exploring a biological fertilizer that respects the environment, she could be developing the fertilizer of the future.

Once she finishes her graduate studies, her priority is to help promote scientific education in her home country. María Gabriela Gei wants to create a research laboratory specialising in plant ecology and biogeochemistry, where future scientists can participate on research projects.

> "I wanted to become an educated voice able to advocate in favour of local communities facing environmental struggles."

Djoudi **Roukia**

COMOROS

Host Institution: Laboratory of Biomolecular and Environmental Chemistry, University of Perpignan, France

Phytochemistry

Djoudi Roukia, a student at Comoros University, is conducting her research in collaboration with the University of Perpignan, where she completed her thesis in 2006. Her research project focuses on a plant from Madagascar that was threatened with extinction due to overexploitation, as well as possible alterations in the equilibrium of soil ecosystems.

For her thesis project, she determined the chemical content of different parts of the plant and the biological activity of these substances. Then, using a combination of chromatographic and spectroscopic techniques, she purified 19 phytoconstituents, including 3 novel components. Thanks to her scientific determination and social commitment, she was able to save the species.

As a woman who grew up on an archipelago in the Indian Ocean north of Madagascar, her universe is naturally the ocean. She specialises in the chemistry of marine biomolecules secreted by a number of organisms that multiply rapidly: her main focus of study today are cyanobacteria, the famous blue-green algae, and sponges.

Djoudi's goal is to count and collect these organisms, identify their chemical signatures and active molecules, and measure the influence of environmental factors in order to better protect her native archipelago. Most extraordinary is that while her top priority is to use these bioactive molecules as markers to monitor environmental fluctuations in the Comoros, her research could also lead to a major discovery that could be used to develop new drugs.

When she completes her studies, Djoudi Roukia hopes to continue collaborating with the Perpignan research team while helping to protect her country's natural resources.

> "My husband took care of our child while I prepared and wrote my thesis."

[2] Report by Yale University and Columbia University, presented at the World Economic Forum in Davos, Switzerland, on 23 January 2008.

Maria-Teresa **Guardiola-Claramonte**

SPAIN

"I do not think that women bring a different perspective to science, I believe it depends more on the personality of each individual."

Host Institutions: International Center for Agricultural Research in the Dry Areas, Aleppo, Syria, and London School of Hygiene and Tropical Medicine, UK

Public Health

Drought will be one of the most visible consequences of climate change: by 2025, 48% of the world population will live within river basins under water stress; i.e. where demand for water surpasses available resources. Consequently, using wastewater in agriculture is a real challenge that urgently needs to be addressed.

Maria-Teresa Guardiola-Claramonte, who is called Maite, recently completed her Ph.D. in hydrology and water resources at the University of Arizona-Tucson. She studied wastewater and how to control the environmental and health risks arising from the use of wastewater in agriculture in the developing countries.

Maite decided to conduct her research in Aleppo, a city of 2.5 million inhabitants in northern Syria. Since there is not enough room to store all of the processed wastewater, it is poured into a riverbed that is normally dry and flows 45km to a lake for storage. Originally clean, the water becomes increasingly contaminated as numerous villages along its route dump wastewater directly into the river. Maite's research will focus on water contamination as it flows towards the lake. She will analyse the metal and bacteriological content of the river water as well as water pumped into the fields for irrigation.

She hopes to establish a list of recommendations for farmers and water management services in the region to maximize the advantages of reusing wastewater while minimising water treatment costs and environmental risks.

After completing her studies, Maite Guardiola-Claramonte would like to continue her research in this field and put her knowledge into practice by working for an international organisation.

Nawal **Bouaynayne**

MOROCCO

"Cooperation between scientists around the globe makes a precious contribution to the development of peaceful relations between nations, societies and cultures."

Host Institution: Faculty of Pharmacy, Paul Sabatier University, Toulouse, France

Chemistry of natural substances

Viral diseases, cardiovascular disorders, high blood pressure and parasitic infections that are hard to eradicate are extremely frequent pathologies. They erode the quality of life of a population and in most cases are fatal. For example, malaria affects 300 to 500 million people a year and is the cause of 1.5 to 2.7 million deaths.

These high stakes caught the attention of Nawal Bouaynayne, a doctoral student in the biology department at the University of Abdelmalek Essaâdi in Tetouan. She explores the pharmaceutical potential of natural substances extracted from four algae species in the Nador lagoon in northeast Morocco. Natural substances originating from plants have enormous potential as new sources of molecules for treating the most resistant forms of cancer or infectious diseases.

In her host laboratory in Toulouse, Nawal is learning to optimise the extraction and isolation of natural substances. By studying the structure of purified samples using various spectroscopic techniques and based on their biological activity, she plans to determine whether they are apt for pharmaceutical use.

Through this project, Nawal Bouaynayne is able to complement the knowledge she acquired at her home university, where she would like to teach once she has finished her doctoral degree. She also hopes her research results will be used to help develop the local economy in Morocco while protecting its natural resources.



Elisabeth **Lendoye**

GABON

Host Institution: Faculty of Medicine,
University of Nice-Sophia Antipolis, France

Physiology

In Gabon, three new cases of diabetes are diagnosed daily. Worldwide, as many as six people die from diabetes every minute. Altogether, this disease causes nearly 4 million deaths a year. By 2025, the total number of deaths could reach 380 million. The main cause in most cases is a poor lifestyle. For example, 80% of all diabetics are overweight.

These figures make it easier to understand the value and the urgency of Elisabeth's research. She started with a basic idea: sufficient muscular activity should offset the development of obesity, and in turn, the development of type-2 diabetes. Also known as adult-onset diabetes, the disease is linked to our increasingly sedentary lifestyle and a diet overly rich in fats and sugars.

Recent research by her host laboratory at the University of Nice showed that muscle cells could be artificially activated to avoid the disastrous effects of insufficient physical activity, thus increasing the blood flow to muscles through the rapid growth of capillary blood vessels.

Elisabeth is concentrating on exploring the links between the PPAR Beta protein and the activity of mitochondria, the cells' energy reservoirs. Her research could eventually lead to the development of new drugs to fight obesity and type-2 diabetes.

Once she completes her Fellowship and doctorate degree, Elisabeth Lendoye hopes to continue her research and become a university professor.

> "Regardless of whether you're a woman or a man, it's not easy being a scientist in Africa!"

Antima **Gupta**

INDIA

Host Institution: Department of Biological Sciences,
Birkbeck College, University of London, UK

Bacteriology

Over 1.7 million people die each year from tuberculosis worldwide, and half of these deaths are in Asia. Tuberculosis is caused by the mycobacteria *"Mycobacterium tuberculosis"*, which has developed resistance to the two most commonly used drugs.

Antima Gupta, who holds a Ph.D. in molecular microbiology from the Central Drug Research Institute in Lucknow, India, is focusing her research on developing models for testing new drugs.

One of the main obstacles to drug discovery is that *Mycobacterium tuberculosis* is highly dangerous and can only be studied under extremely rigorous conditions. This extends the duration and cost of research. To circumvent these obstacles, Antima decided to use a closely related mycobacteria, *Mycobacterium aurum*, which offers several advantages: it is not a human pathogen, it has the same sensitivity to drugs and it has developed the same resistances. It is thus an excellent candidate for evaluating new treatments while reducing the costs, time and risks of experiments.

In the laboratory at Birkbeck College, Antima will infect human white blood cells with resistant strains of *Mycobacterium aurum* in order to test a battery of natural and synthetic molecules. Once the most effective molecules have been identified, she will analyse the bacteria cells to determine the precise target and mode of action of new drug molecules.

After returning to India, Antima Gupta would like to use her expertise in these new techniques to work on behalf of her country.

> "Being a woman itself posed a big challenge towards pursuing my career in science. Many times I had to encounter social pressure that I should avoid higher education and rather focus on family-oriented tasks."

Yifen **Tan**

MALAYSIA

"I have a deep passion for studying the relationship between genetics and human diseases."

Host Institution: Department of Microbiology and Molecular Genetics, Harvard Medical School, USA

Molecular Genetics

In France alone, nosocomial infections, also known as hospital-acquired infections, may affect between 700,000 and one million patients each year. Worldwide, as many as 15-20% of all hospitalized patients may be concerned. Among the bacteria responsible for this infection, *Pseudomonas aeruginosa* is highly resistant to antibiotics. For vulnerable patients, the mortality rate can be as high as 50%. Thriving in humid environments, it can develop in distilled water and saline solutions, and even in certain antiseptic solutions and antibiotics.

Yifen Tan has a Ph.D. in molecular biology from the Universiti Sains Malaysia in Penang, where she studied the genetics of human pathogens. Since numerous pathogenic bacteria have developed a resistance to antibiotic treatments, it is important to understand the mechanisms of pathogenesis and identify targets in order to develop a new generation of drug treatments.

Pseudomonas aeruginosa develops a biofilm that makes it resistant to antibiotics. Yifen managed to identify the regulatory elements (sRNAs) associated with the formation of the biofilm. She now intends to pinpoint the genes responsible for its formation, ultimately to prevent the development of the biofilm and to amplify the effect of antibiotic agents.

After her postdoctoral internship, Yifen Tan plans to pursue research in this field. She also hopes her work will be applicable to other pathogenic bacteria.

Marissa **Teo**

SINGAPORE

"Mentorship is essential because it provides you with the opportunity to 'learn the ropes' from someone who is more experienced than you."

Host Institution: Center for Cell and Gene Therapy, Baylor College of Medicine, Houston, USA

Tumour Immunology

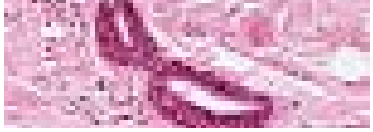
The Epstein Barr virus (EBV) infects the vast majority of humans at some point in their lives. The virus can live forever in healthy subjects without being noticed. In China, Southeast Asia, the Arctic region and North Africa, EBV plays a key role in the development of rhinopharyngeal cancer.

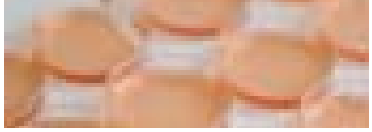
Marissa Teo holds a Ph.D. in biochemistry and molecular biology and is currently doing post-doctoral research at the National Cancer Centre in Singapore. She is working on a clinical trial using cell therapy, or more precisely, immunotherapy, which raises hopes for a potential treatment for patients with rhinopharyngeal cancer.

At the laboratories of Baylor University, pioneers in the use of cell therapy to combat infectious diseases, she will study EBV that infects lymphocytes, a variety of white blood cells that intervenes in the immune response system, and which end up causing cancer. Marissa first plans to collect lymphocytes from patients to develop *in vitro* lymphocytes that are specially directed against EBV. She then plans to use radiation therapy on patients to ensure they no longer have any infected lymphocytes. Thereafter, she will inject the lymphocytes "trained" to fight EBV back into the initial donor.

Through this ambitious, experimental procedure, she hopes she will soon be able to replace current chemotherapy treatments, which are not systematically effective and have severe side effects.

On returning to Singapore, Marissa Teo plans to share her newly acquired knowledge with local researchers. Cell therapy is still not used much in Asia, and Marissa would like to open a regional centre in Singapore dedicated to this practice.





Marietta Solange **Soupi Nkeutcha**

CAMEROON

Host institution: Laboratory of Chemistry of Natural Substances, University of Limoges, France

Plant Biotechnology

The world market for cacao is worth 3 billion dollars a year. The lion's share of production (about 70%) comes from Africa, where it is a source of livelihood primarily for small growers. Yet an estimated 30% of world production is threatened by climate conditions, various diseases, insects, fungi and parasites.

Marietta's research project focuses on growing cocoa tissue. Her goals include meeting the challenges of sustainable development, improving the life of small growers, protecting the environment and promoting product diversification. She is working to create more resistant varieties that require fewer chemical treatments.

To achieve her goal, Marietta wants to develop a rapid *in vitro* multiplication technique using somatic embryogenesis. Embryos are obtained from vegetative tissues (leaf, flower, stem, etc.) of the plant to be cloned. This technique produces a large number of identical plants from a small amount of vegetal matter.

Marietta is also studying the role of arabinogalactan proteins in the natural development of the cacao embryo. She believes that through a better understanding of the protein's role, her procedure will produce more promising results.

Upon finishing her Fellowship, Marietta Solange Soupi Nkeutcha plans to return to her home university in Yaoundé to teach and continue her research.

> "A science career is a challenge for us women but we must make our contribution to creating better health and better living conditions."

Diana Marcela **Bolaños Rodriguez**

COLOMBIA

Host Institution: Department of Biological Sciences, University of Massachusetts Lowell, USA

Marine Biology

Polyclad flatworms are mainly known for their beautiful colours. They can be found in seas around the globe, notably off the coast of Colombia, Diana Marcela's country of origin. One of the striking features of flatworms is that if you cut off a part, they are able to regenerate the missing tissue as long as the brain has not been damaged. These neglected species could prove to be extremely valuable in fields such as neurobiology, toxicology, pharmacology and stem cell research, where they could make major contributions to human health.

By deciphering the regenerative capabilities of flatworms, it should be possible to understand the fundamental aspects of invertebrate biology and evolution.

Using these small marine worms as models, Diana Marcela hopes to understand how tissue regenerates itself after a wound, and what roles the brain and the central nervous system play during the process.

Ultimately, a better understanding of the regeneration of human tissue and the regulatory mechanisms in the brain and nervous system (neurotransmitters and biochemical factors) are crucial steps for treating paraplegic patients and people with nervous system lesions.

After completing her scholarship, Diana Marcela Bolaños Rodriguez would like to pursue her research in a university setting and fulfil her passion for teaching by sharing her knowledge with young students.

> "I have put a lot of effort towards my career to be a good professional, but I also wanted to have a family and have a happy personal life."

Ghalia **Boubaker**

TUNISIA

Host Institution: Institute of Parasitology, University of Bern, Switzerland

Molecular Biology

A tapeworm belonging to the genus *Taenia* is a parasitic worm in the intestine that can grow as long as 10 metres. Another tapeworm, *Echinococcus granulosus*, can cause a severe pathology, echinococcosis, or the hydatid disease, which develops in the abdomen of humans. Echinococcosis is common in the Middle East, North and East Africa, Australia and Argentina. Potentially fatal, it generates serious economic and public health problems. Generally treated through surgery, the disease has a high recurrence rate of up to 20%. It is hard to diagnose a relapse, so patients must be monitored regularly.
Ghalia Boubaker, a doctoral student in pharmaceutical sciences at the University of Monastir School of Pharmacy in Tunisia, has focused her research on this pathology. She hopes to develop a rapid, reliable blood test to distinguish patients who have completely recovered from those likely to relapse. In her Swiss host laboratory, she has already identified a parasitic protein, the P29. To determine whether this protein can be used as a reliable biomarker, she will study the molecular structure of the gene responsible for its production. Her conclusions will be used to develop a post-surgery prognostic kit.
On returning to Tunisia, she hopes to continue collaborating with her Swiss host laboratory and to use the knowledge she has acquired through her Fellowship to help eradicate epidemics that threaten human health.

> “What I like is doing research in different countries, learning to exchange and share knowledge and experiences and feeling like I am an integral part of an international research network.”

Svitlana **Yablonska**

UKRAINE

Host Institution: School of Medicine, University of Pittsburgh, USA

Biochemistry

After breast cancer, cervical cancer is the second most frequent cancer to affect women. According to the World Health Organisation, cervical cancer kills 290,000 women worldwide each year, which makes it one of the main causes of cancer mortality in women under 50.
Svitlana Yablonska holds a Ph.D. in biochemistry and is currently conducting post-doctoral research at the Taras Shevchenko National University of Kiev in Ukraine. She is researching human papillomavirus (HPV), which we now know is responsible for virtually 100% of cervical cancers worldwide. Although a vaccine has existed for a few years, not all women have access to it, and millions of women are still infected and risk developing the disease.
When a papillomavirus penetrates a mammal’s cell, it generally integrates its genome with that of the cell. HPV E6 and E7, two types of proteins, are produced by oncogenes, genes that trigger a chaotic proliferation of cells. Svitlana plans to examine this cell deregulation process and to study the role of small regulating agents in the production of proteins (micro RNA). At the University of Pittsburgh, where she is conducting her post-doctoral research, researchers have already carefully explored the regulation mechanisms of E6 proteins. They demonstrated that this protein reduces the rate of micro RNA, resulting in an increase in the protein responsible for forming tumours.
Through a better understanding of this process, Svitlana hopes to establish early markers of the disease and to identify targets to be used in the development of new drugs. When she returns to Ukraine, she will share her knowledge with other researchers in her country, where she hopes to head a research department and serve as a role model for women in science.

> “Today, the world needs more educated people and scientists to solve urgent challenges.”



Hadeer **El-Dakhakhni**

EGYPT

Host Institutions: Institute of Physics and Chemistry of Materials, Strasbourg, France, and National Research Centre, Biomaterials Department, Cairo, Egypt.

Biomaterials

It is estimated that over 10 million people wear articular prostheses for hip, knee or shoulder replacements. To achieve biocompatibility, the interaction between the metal of the prosthesis and the organic part of the bone must have the fewest imperfections possible.

This is precisely the research focus of Hadeer El-Dakhakhni, a physics professor at Ain Shams University in Cairo, with a Masters in biophysics. She works with Professor Karimat El-Sayed, Laureate of the 2003 L'Oréal-UNESCO Awards For Women in Science, who suggested that she apply for the Fellowship. Hadeer is also an associate in the biomaterials department of the National Research Centre in Cairo. She is interested in clinical applications, notably dental implants and artificial joints. The challenge is simple: to enable the bone to grow despite the presence of a foreign element, without triggering harmful reactions.

Consequently, she is seeking to develop the most efficient materials. She is exploring different types of chemical coatings to improve the performance of implants made from titanium alloy, a light, solid and flexible metal that unfortunately is not sufficiently compatible with biological tissues. She must also ensure the coating has antibacterial properties, because infections are one of the main causes of implant rejection.

At the end of her scholarship, Hadeer El-Dakhakhni will continue her doctoral studies at her home university. She hopes her results will inspire other young researchers and will help improve orthopaedic and dental care.

"Continuing my research in different countries means a lot to me. It exposes me to different cultures and points of view. I hope I will be able to give something back one day."

Irene **Margiolaki**

GREECE

Host institution: European Synchrotron Radiation Facility, Grenoble, France

Structural Biology

We now know a lot about proteins, which are essential for cell life: between 200,000 and 300,000 proteins have already been identified. Yet their biological functions, which are closely linked to their three-dimensional structure, are still mysterious. This constitutes an immense field of research.

One stimulating path is crystallography, which can be used to obtain the 3D structure of proteins. This gives us a better understanding of their mechanisms of action and their ties with other molecules present in the cell or administered through drugs. We can also use this procedure to grasp how structural modifications can affect their initial functions.

Irene Margiolaki, who is pursuing her research at the European Synchrotron Radiation Facility (ESRF) in Grenoble, has devoted her research to this technology. Her research has concrete, urgent implications: it can be used to determine the structure of viral proteins capable of fighting emerging viruses in Southeast Europe that cause severe viral haemorrhagic fevers (VHFs) and can trigger deadly epidemics.

When she finishes her studies, she wants to create a multidisciplinary research group in structural virology at the University of Patras, Greece. She also plans to continue her collaboration with the ESRF in order to facilitate cooperation with the Greek scientific community.

"A society that neglects its thinkers, philosophers, teachers, scientists or artists is doomed from the start."

Margoth Mitchela **Moreno Vigo**

PERU

> “One of the reasons I chose this career was to contribute to scientific knowledge, especially concerning problems specific to South America.”

Host institution: Severo Ochoa Molecular Biology Centre, Autonomous University of Madrid, Spain

Proteomics

With a Ph.D. in the biomedical sciences, Margoth Mitchela is currently working at the Peruvian National University of the Amazon (UNAP) in Iquitos where she is a research assistant in parasitology and molecular biology. Using sophisticated techniques, she analyses the proteomes in the cardiovascular muscle; i.e. all of the proteins existing in a cell at a given moment.

Proteomes play a fundamental role because these proteins execute the instructions of genes to ensure cellular functioning. Yet there is a major difficulty with proteomes: they are permanently changing depending on the surrounding environment and exposure to aggressions. Examining these changes could provide key indications of the cause of the disease and its prognostic.

On returning to Peru, Margoth Mitchela Moreno Vigo hopes to contribute to her country’s scientific development. She would also like to apply the most recent research techniques on proteomes to the massive public health problems plaguing the entire South American continent.

One example is American trypanosomiasis, or Chagas disease, an endemic parasitic disease found in eighteen countries of Latin America that is transmitted by the blood-sucking assassin bug. The most serious complication, cardiomyopathy, is often fatal. The WHO estimates that between 16 and 18 million people are infected. Moreover, the migration of Latin American populations to other continents gives the Chagas disease full range to propagate elsewhere in the world, notably in the United States and Europe.

About the L'Oréal Corporate Foundation

The L'Oréal Corporate Foundation, created in 2007, pursues the goal of making the world a better place each day. Drawing on the Group's values and professional expertise, the L'Oréal Foundation aims to reinforce and perpetuate the Group's commitment to responsible citizenship.
As the second largest corporate foundation in France with a multi-annual budget of €40 million, the L'Oréal Foundation is active in three main areas: supporting scientific research and the role of women in science, helping vulnerable people regain self-esteem and social reintegration, and fostering access to education.

About UNESCO

Since its creation in 1945, UNESCO has pursued the mission of promoting science for sustainable development and peace. Today UNESCO focuses on policy and on capacity building in science, technology and science education, on managing freshwater, oceans and earth resources in a sustainable manner, on the protection of biodiversity and on climate change. The Organization is committed to the elimination of all forms of discrimination and the promotion of gender equality, especially in the field of scientific research.

A Testament of Dedication: The Charter of Commitment For Women in Science

The L'Oréal Foundation and UNESCO have called on each of the Laureates honoured by the Awards to sign a Charter of Commitment. With 57 signatures to date, this Charter carries the spirit of the scientific community that lies at the heart of the programme.

More information:
http://www.forwomeninscience.com
http://www.unesco.org/

http://www.agora.forwomeninscience.com
http://www.twitter.com/4womeninscience
http://www.facebook.com/pages/LOreal-UNESCO-For-Women-in-Science-Official-Page/94832361282

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