The Andalusian Initiative for Advanced Therapies

Natividad Cuende and José L Zugaza at the Andalusian Initiative for Advanced Therapies discuss an organisational model to facilitate new therapeutic opportunities

Andalusia is located in the south of Spain, and with 8,300,000 inhabitants, it is the most populated region of the country. In 1981, it was established as an autonomous region, taking on the responsibilities for its population’s health. The Regional Ministry of Health of the Andalusian Government currently manages all public health resources, and has a public healthcare system with universal coverage.

This region aspires to become a leader in offering the latest therapeutic opportunities to its citizens, and the Regional Government, in line with the wishes of the Andalusian people, is committed to promoting research on advanced therapy and its translation into clinical settings.

Recent Achievements

From a legislative point of view, Andalusia was one of the first regions in the world to pass a law authorising investigations using embryonic stem cells, as well as to allow techniques such as cell reprogramming, including somatic nuclear transfer with therapeutic aims only. Additionally, in 2005, the Regional Government approved a decree that regulates preimplantation genetic diagnosis that is offered for free in the Andalusian public health system as well as the selection of a human leukocyte antigen (HLA) identical sibling for therapeutic purposes.

In recent years, several research groups from Andalusia have been recognised for their contributions in this area by participating in national and international networks. Besides that, the Regional Government, through its Ministries of Health and Innovation, Science and Industry, has invested in this biomedical field, and has developed, specifically but not exclusively, three research programmes related to advanced therapies: the cell therapy and regenerative medicine programme, the clinical genetics and genomic medicine programme and the nanomedicine programme. The Regional Government supports these programmes through the Andalusian Initiative for Advanced Therapies, sponsoring research projects, implementing training programmes, recruiting research groups, creating a network of research facilities and establishing collaborations with some biotechnological and pharmaceutical companies.

This investment has resulted in agreements between the Regional Ministries of Health and Innovation, Science and Industry with different Andalusian universities and, in some cases, with the CSIC (the Spanish Research Council), the Health Institute Carlos III (belonging to the Spanish Ministry of Science and Innovation) or pharmaceutical companies, to build specific research centres for the three programmes (see Figure 1):

- The programme for cell therapy and regenerative medicine: CABIMER (Andalusian Centre for Molecular Biology and Regenerative Medicine) in Seville
- The programme for clinical genetics and genomic medicine: GENYO (Pfizer – University of Granada – Andalusian Government Centre for Genomics and Oncological Research) in Granada
- The programme for nanomedicine: BIONAND (Andalusian Centre for Nanomedicine and Biotechnology) in Malaga

Other research centres have been created, including the research centre in innovative medicines: MEDINA (Andalusian Government-MSD-University of Granada) and several health research institutes linked to the Andalusian University Hospitals, such as IBIS (Biomedical Research Institute) in Seville and IMIBIC (Maimónides Institute for Biomedical Research) in Cordoba, among others. Recently, the Regional Government has announced the creation of the Andalusian Cellular Reprogramming Laboratory and the investment of €27 million for a high-throughput sequencing platform within the Medical Genome Project to characterise directly a large number of genetic diseases.

In addition to research centres, Andalusia has a network of biobanks for tumours, DNA, umbilical cord blood (the third largest bank in the world in terms of stored samples of umbilical cord units for allogeneic transplant) and stem cells (the central node of the National Cell Lines Bank). The Regional Ministry of Health has also built a network of public GMP laboratories to produce cell-based medicinal products. Last year, the Regional Ministry of Health, in collaboration with the Spanish Ministry of Health and Social Policy, developed a pioneer programme in Europe aimed at training professionals to manufacture medicinal products for advanced therapies.

Other achievements to consider are the establishment of new embryonic stem cell lines, as well as the remarkable increase in the number of clinical trials in cell therapy currently in progress in the region (see Figure 2, page 84).
On the other hand, the Regional Ministry of Innovation, Science and Industry has also developed a set of financial and support tools, such as grants for research projects of excellence and an incentive programme for the promotion of innovation and business development. This programme includes direct non-repayable and repayable incentives, interest rate subsidies, participatory loans and investment in share capital. These tools are contributing to R&D and innovation in this research field and promoting the creation of companies.

These scientific contributions and health activities have occurred in a context in which Andalusian society has supported them and in which different institutions have expressed their engagement to boost these therapies. As a result of this combined effort conducted over the last few years, today we find that Andalusia is fast becoming one of the most active regions in advanced therapies.

The Andalusian Initiative for Advanced Therapies

The recent progress of research in advanced therapies (cell and gene therapies and tissue engineering) has given rise to new hope in the treatment and diagnosis of many illnesses for which there is currently no cure. Translational research in the fields of cell therapy and regenerative medicine, clinical genetic and genomic medicine and nanomedicine seems to have a key
role in facing these research challenges. As a result, the Regional Government steered the Andalusian Initiative for Advanced Therapies in 2008, giving it high priority.

This Initiative is promoted by the Ministries of Health and Innovation, Science and Industry. Its mission consists of developing new therapies in order to improve the health of the population and to incorporate advanced therapies in Andalusia as a part of healthcare innovation and progress of our region. It seeks alliances between academies, research institutions, medical centres and patient organisations. To make this project successful, strong links must be established with biotech and pharmaceutical companies, and ways must be found that enable these companies to become strategic partners to develop this Initiative, in order to make the advanced therapies area one of the most dynamic elements of our business network and economy.

The overall objectives that the Andalusian Initiative for Advanced Therapies plans to develop are:

- To provide equitable access to potential new treatments for the population
- To develop a business network that facilitates the development of therapies, promoting effective

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**Figure 2: Current non-commercial clinical trials with cell therapies in Andalusia**

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<thead>
<tr>
<th>CLINICAL TRIALS IN ADVANCED THERAPIES 2010</th>
<th>Authorisations pending</th>
<th>Start-up phase</th>
<th>Recruitment phase</th>
<th>Follow-up phase</th>
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<tbody>
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<td>Cardiology</td>
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<td>Dilated myocardopathy</td>
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<td>Myocardial infarction</td>
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<td>Chronic ischemic cardiopathy</td>
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<td>Neurology</td>
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<td>Multiple sclerosis</td>
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<td>Stroke</td>
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<td>Immunology</td>
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<td>Graft versus host disease</td>
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<td>Peripheral vascular diseases</td>
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<td>Chronic critical ischaemia in lower limbs</td>
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<td>Chronic critical ischaemia in lower limbs</td>
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<td>in non-diabetic patients</td>
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<td>Hepatic regeneration</td>
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**Figure 3: From knowledge to innovation: areas that the Andalusian Initiative for Advanced Therapies encompasses**

- Knowledge generation
  - Basic research
  - Preclinical research

- Knowledge diffusion and training
  - Agreements with universities
  - Agreements with other institutions
  - Public awareness

- Knowledge application
  - Accreditation
  - GMP facilities and quality systems
  - Investigational medicinal products
  - Clinical trials

- Knowledge transfer
  - Public-private partnership for industry development
  - Phase III and marketing approval
  - Improvement of production processes
mechanisms for knowledge transfer and collaboration to business

- To promote synergy of the three research programmes in advanced therapies: the cell therapy and regenerative medicine programme, the clinical genetics and genomic medicine programme and the nanomedicine programme

- To facilitate partnerships between all the actors involved in R&D processes through open and transparent mechanisms that allow optimal use of resources and efforts spent on this project

- To concentrate efforts to promote translational research, providing the support tools for the production and application of medicinal products for advanced therapies, according to the requirements of regulatory agencies

- To facilitate the participation of leading scientists from all biomedical fields, clinical researchers, research managers, patient associations and the private sector

- To identify the necessary tools to meet the needs of all stakeholders involved in the Andalusian Initiative for Advanced Therapies

Current Activities

This Initiative, in accordance with its mission statement and objectives, is developing appropriate plans and tailoring resources, as well as encouraging synergies among the three research programmes related to advanced therapies and promoting clinical translation. The strategic plan for the period 2010 to 2015 has been established through the Initiative’s steering committee, advisory board and seven working groups, with the participation of all the stakeholders: scientists, research managers, clinicians, members of the regional ministries of health and innovation, science and industry and representatives from Andalusian universities, ethics committees, patient associations, and biotechnological and pharmaceutical companies.

The activities that the Andalusian Initiative for Advanced Therapies is carrying out are part of the key stages in the process of research and innovation: generation, diffusion and application of new knowledge, and knowledge transfer (see Figure 3), with special emphasis on translating research results into new therapies. For this reason, the organisation is acting as the sponsor of non-commercial clinical trials with advanced therapies. At present, eight clinical trials are being carried out, and another four multi-centre clinical trials approved by ethics committees are awaiting approval by the Spanish Medicine Agency (see Figure 2).

One important aspect of this project is the role and contribution of biotech and pharmaceutical companies to generate not only knowledge, but also to support major economic and social development in Andalusia. Consequently, the Andalusian Initiative for Advanced Therapies has signed several collaboration agreements with different companies and is interested in seeking other partnerships.

Conclusion

Over the last few years, Andalusia has made a tremendous effort to promote research, development and innovation in the biomedical field, particularly in the advanced therapies area, which includes: cell therapy and regenerative medicine, clinical genetics and genomic medicine and nanomedicine.

The aspirations of Andalusia are to occupy an important role in research, development and innovation in this biomedical area, making advanced therapies one of the drivers of scientific progress, health improvement, and social and economic development for the region.

About the authors

Natividad Cuende is the Executive Director of the Andalusian Initiative for Advanced Therapies. She has a medical degree from the University of Navarra and a PhD from the Universidad Autónoma of Madrid. She was a clinical resident, becoming a specialist in preventive medicine and public health, and in family medicine. She has a Masters degree in Public Health from the Spanish School of Public Health, a Diploma in Design and Statistics for Health Research (Universidad Autónoma of Barcelona) and a Diploma in Health Management (Andalusian School of Public Health). Natividad worked for the Spanish Transplant Organization for over seven years where she designed and implemented the National Liver Transplant Registry and the National Quality Assurance Programme for the Organ Donation Process, that has been implemented in other European and American countries.

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José L Zugaza is the Deputy Director of the Andalusian Initiative for Advanced Therapies. He has a PhD in Pharmacology from the University of Santiago de Compostela and a Masters in Business Administration from the European Business School (ESEUNE)/Georgetown University. He developed his research career at the Imperial Cancer Research Fund in London (UK), at the Centre d’Etudes Pharmaceutiques de l’Université Paris XI (France), and at the Cancer Research Centre of Salamanca (Spain). Before joining the Andalusian Initiative for Advanced Therapies, he was a principal investigator at the Centre for Cooperative Research in Biosciences in Derio, Spain.

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