

**Erwin Wagner pioneered the first transgenic animal models which today are key to the advancement of biomedical research in multiple diseases in humans ranging from Alzheimer's to Cancer**

**Welcoming one of the masters behind transgenic research to Madrid: Erwin Wagner, internationally acclaimed expert within the field, joins forces at the Spanish National Cancer Research Centre (CNIO)**

Attracted by the prospect of joining the Faculty of a public research centre of excellence, elite foreign scientist Erwin Wagner arrives in Madrid.

He is not the first foreign scientist over recent years to come to Spain to pursue his career. Thanks to new management models that are happily being introduced to the Spanish R&D system, increasing numbers of prestigious foreign scientists are relocating to Spain to conduct research of the highest calibre, reversing the so-called 'brain drain' that almost paralysed home-grown biomedical research.

The Spanish Minister for Health and Consumer Affairs, Bernat Soria, today (4 February 2008) held a press conference to announce the arrival of the 'godfather' of transgenic research to the Spanish National Cancer Research Centre (CNIO). Austrian-born Erwin Wagner is a pioneer in the generation of the first ever transgenic animal models, a leading expert in diseases deriving from dysfunctional Fos and Jun oncogenes as well as other diseases such as psoriasis and bone disease.

Previously appointed as Deputy Director of the Institute of Molecular Pathology (IMP) in Vienna - one of the most prestigious research centres in Europe sponsored largely by the pharmaceutical giant Boehringer Ingelheim, he is also a Professor at the University of Vienna. He has authored more than 250 papers published in the most prestigious scientific journals such as Nature, Cell and Science.

Initially he will balance his time and expertise between his commitments in Madrid and Vienna, but will then be fully incorporated at the CNIO this coming April where he will set up and direct the CNIO Cancer Biology Programme. The Minister of Health and Consumer Affairs said today:

"Erwin Wagner is an exceptional scientist at the very pinnacle of his scientific career. His incorporation at the CNIO not only marks the arrival of a most prestigious scientific figure to Spain but also serves as testament to the Centre's scientific

excellence which has earned the CNIO its reputation as a principle driver behind the advancement of cancer research today.”

“Over the past 3-4 years I have been extremely impressed by the committed support that the Spanish government has demonstrated in science generally, biomedicine particularly.” affirmed Wagner.

“Much more for me than an honour, the very fact that the CNIO has spurred me to leave my home country Austria, is a clear indication of my commitment to the CNIO. I consider the benefits to be gained by my career move as mutual. The most decisive factor behind my decision to join the Centre has been the outstanding progress made over the last 5-6 years thanks to the inspirational leadership, dedication and determination of its Director Mariano Barbacid.

The operational and management systems in place at the CNIO, the resources available to its Faculty - notably the Animal Facility, inarguably one of the best worldwide - coupled with a unique scientific ‘culture’...to put it purely and simply, the CNIO translates into scientific excellence. Based upon my extensive experience in research and setting up international laboratories of reference, I am totally convinced that that the CNIO will become an increasingly attractive prospect for foreign scientists. I can predict that the ‘great and the good’ will soon be following in my footsteps leading them to the CNIO,” said Wagner.

“Recruiting Erwin Wagner”, explained Mariano Barbacid, “has been administratively feasible thanks to the management and organisational models enjoyed at the CNIO. The contractual terms and conditions that we offer Spanish nationals and foreign scientists alike depend on rigorous evaluation criteria, affording our Centre with the highest levels of competitiveness.”

Erwin Wagner concluded by asserting that way beyond Spain’s borders, the CNIO is widely recognised as a leading cancer research centre both within Europe and internationally, impacting the scientific community on a global scale.

### **New Horizons: the CNIO Cancer Biology Programme**

Molecular Oncology centres its activity on and around the identification of genes implicated in cancer using transgenic animal models. Insight into the role of such genes in cellular proliferation – and even more critically – the physiological and pathological development of tumours is paramount. Such discovery will provide new direction in generating novel and more effective diagnostics, driving clinical application as well as developing new treatment methodologies.

This will be the focus and function of the CNIO Cancer Biology Programme to be directed by Erwin Wagner. Wagner is a leading international reference within the field, recognised for myriad achievements such as pioneering the very first transgenic mouse models and his work on the role of the Fos and Jun families of oncogenes whose normal functions are to act as transcription factors and regulators of many physiological processes such as bone formation.

“The Cancer Biology Programme will centre its research on and around the understanding of tumour growth as an “extrinsic organ” in different tissues by studying all possible aspects of tumour stem cells, tumour cell interaction with host cells, the role of angiogenesis and cellular metabolism employing genetic and biochemical tools. We will do these using powerful mouse genetic and human cellular models. We will also continue to study the function of tumour markers in normal organ development, cancer and other diseases such as Psoriasis and those for which my research group has been developing mouse models over the last few years”, explains Wagner.

The Cancer Biology Programme will allow the CNIO to take an important next step forward in basic cancer research, heighten yet further the prestige associated with the Centre as a centre of international reference, as well as substantially elevate its scientific excellence. “This new Programme,” says Barbacid, “will afford the CNIO a nexus; a link connecting basic research with applied which is essential in CNIO’s consolidation as a comprehensive cancer research centre. Importantly, this addition will bring the CNIO closer to ultimately delivering on its mission: to rapidly translate the very latest discovery into a reality for cancer patients in Spain.”

### **Profiling Erwin Wagner**

Erwin Wagner was born in Wolfsberg, Austria in November 1950. He is the author of some of the most innovative and relevant biomedical discoveries published, one of which has been the design and generation of the very first transgenic animal models, which has earned him the reputation as a ‘pioneer’ of transgenesis.

His doctoral studies with Manfred Schweiger at the Max Planck Institute in Berlin on genetic regulation in bacteria provided a basis for his studies in mammalian systems. Under the mentorship of Beatrice Mintz (Fox Chase Cancer Center, Philadelphia, USA), he co-developed gene transfer methods into fertilized eggs by microinjection of DNA, but also into tumor stem cells (teratocarcinomas), which provided the bases for the generation of transgenic mice – an essential tool for cancer research but also for many other biomedical fields.

Over the past 15 years, his most notable scientific contributions have been made in the analysis of gene function in mammals, including the family of transcription factors Fos

and Jun that are often activated as oncogenes. He has also made important contributions in defining the functions of the transcription factors Fos and Jun in bone, hepatic, cardiac, dermatological, hematopoietic and neuronal development.

Other studies were developed based on the identification of the physiological roles of these transcription factors and the development of animal models that deal with the analysis of complex biological factors associated with cancer. Wagner has also studied the role of genetic instability, the signaling of growth factors and growth factor receptors in blood vessel formation and epithelial development, which are key processes in tumour progression.

He has pursued his research career in Graz, Berlin, Innsbruck, Philadelphia and as a group leader at the EMBL in Heidelberg from 1983-1988, where he established the mouse transgenic technologies into embryos and stem cells in Europe. Since 1988 he has been appointed as senior scientist at the Institute of Molecular Pathology (IMP) in Vienna, where he served as Deputy Director since 1997 and Head of the “Gene function in mammalian Development and Disease” group.

Wagner is a Professor at the University of Vienna and also serves on the Scientific Advisory Committee at the Centre for Genomic Research (CRG) in Barcelona and was Member of the Board of Trustees and Executive Committee of Boehringer Ingelheim Fonds (BIF) for the last 12 years.

He enjoys one of the most solid international reputations, mirrored by the fact that his developmental biology findings have been the most cited in Europe within the 1999-2005. He is also recipient of several honors such as the Max Planck Prize, the EMBO Gold Medal in 1990 (later awarded to the Director of the CNIO’s Molecular Oncology Programme, Maria Blasco in 2004), the Wittgenstein Prize from the Austrian government, the biennial Brupbacher Prize in 2003 (awarded to Mariano Barbacid in 2005).

Currently, his research group focuses on the study of the function of genes implicated in cell proliferation/differentiation in mammalian development and in pathological processes/diseases. His transgenic models of abnormal proliferation and differentiation represent an important advancement in normal developmental biology and cancer formation.

### **Reversing the scientific ‘brain drain’: the dream becomes reality**

Erwin Wagner is not the only foreign scientist to have been attracted by the CNIO. Over the last 2-3 years, an extremely prestigious group of scientists from countries which are traditionally considered as elite in biomedical research such as the US, the

UK or Germany, are beginning to come to Spain – not just for our favourable climate or “quality of life”, but for the possibility of developing a scientific career in highly competitive conditions.

This phenomenon, for the moment not a general trend, is common - yet not exclusively - to two Spanish research centres: the CNIO in Madrid and the Centre for Genomic Regulation (CRG) in Barcelona.

What do these two Centres have in common? Fundamentally three things: They are both new and directed by scientists with solid experience working abroad (Mariano Barbacid and Miguel Beato); they have limited yet realistic budgets, and above all, they enjoy a completely different management model from the traditional system operating in other Spanish research centres.

For these such reasons, the CNIO has succeeded in attracting other prestigious foreign scientists including American scientist, James R. Bischoff, Director of the CNIO Experimental Therapeutics Programme, and Paolo Pevarello from Italy. Both have experience working within leading multinational companies including Sanofi-Aventis and Pfizer respectively.

Similarly, the CRG now counts twelve non-Spanish Group Leaders including Thomas Graff, Vivek Malhotra and Ramin Shiekhattar – leading scientists of international reference who have all served as Full Professors at prestigious American universities such as the Albert Einstein College of Medicine (New York), the University of California or at research centres of excellence such as the Wistar Institute (Philadelphia).

These scientists share two things in common. Firstly, they have all chosen to work in Spain over the last 2-3 years, and second, they have all been lured by more favourable professional conditions offered through this new management model.

If the Spanish Administration continues to support and commit to R&D as well as facilitate more flexible management systems, the sorry exodus of Spanish scientists will be reversed and Spain’s place and rank among the National elites in biomedicine will be well within reach.