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International Center of Neuroscience
and Genomic Medicine

Contents

June Editorial

Integrity

Integrity is the moral version of professional excellence, personally and methodologically. Integrity is essential in any profession, from the humble workmanship of the bricklayer to the most sophisticated operation of the aeronautical engineer. Medicine, without professional integrity, is a profession of biological mechanics, lacking the ethical and deontological dimension that confers the responsibility of having the lives of others in your hands. The main ingredient of professional integrity is knowledge, not degrees and diplomas (which are bought). Knowledge and wisdom are items that do not lend themselves to marketing, or bureaucratic manipulation, or the game of favors in corridors and offices. Knowledge implies the ability to confront reality, understanding the nature of problems, and the authority to find objective solutions.

When education rewards mediocrity by assigning the same value to failure as it does to passing, it detracts from effort and sacrifice, encourages strong obsession with degrees and despises knowledge. **Samuel Johnson** said in *Rasselas*: "Integrity without knowledge is weak and useless, and knowledge without integrity is dangerous and dreadful." **Henri Frederic Amiel** published in a newspaper in June 17, 1852: "The test of every religious, political or educational system is the man that it forms. If a system injures the intelligence it is bad; if it injures the character it is vicious; if it injures the conscience it is criminal."

Integrity requires being true to yourself. **Thomas Paine** indicated in *The Age of Reason* that "it is necessary to the happiness of man that he be mentally faithful to himself. Infidelity does not consist in believing, or in disbelieving; it consists in professing to believe what he does not believe." When a professional bends his knowledge to political whim, when he distorts a liberal profession and turns it into an uncritical proletariat, when he acts against his own

criteria so as not to disturb power, when he puts the interests of a few before the welfare of the majority, when he places envy above respect, when he talks about what he does not know, when he overvalues what is worthless and devaluates what is valuable, when he makes unfounded judgments that confuse some and offend others, then he cannot be faithful to his professional integrity. **Francis Bacon** advised in *Of Wisdom for a Man's Self* "be true to yourself to the same extent that you are not false to others." The consciousness of falsehood or insincerity pushes to justification, in the style of **Julius Caesar** with his famous phrase, "Caesar's wife must be above suspicion", to justify his divorce from Pompeii, unconsciously involved in a scandal. But insincerity has many faces and its interpretation varies according to the setting and personal conscience; it can be seen with the purity of **Anne Morrow Lindberg**, in *Gift from the Sea*, who had discovered that insincerity was one of the most exhausting things in her life; or it can be seen in the manner of **Oscar Wilde** in *The Picture of Dorian Gray*, where insincerity is merely a method by which we can multiply the different variants of our personality.

Insincerity that cracks integrity is an attack on honor. In a letter from **Pietro Aretino** to Giambattista Castaldo, dated March 25, 1537, it reads: "A man who permits his honor to be taken, permits his life to be taken." Honor upholds integrity and, in every professional gesture, honor and integrity are supported. Who tolerates cracks in one, damages both. In his *Satires* of 1666, **Nicolás Boileau** pointed out that "honor is like a steep island without a shore: one cannot return once one is outside;" and **Juvenal** argued that "hold it the greatest wrong to prefer lifer to honor, and for the sake of life to lose the reason for living." Honor is the garden in which integrity flourishes. "He has honor if he holds himself to an ideal of conduct though it is inconvenient, unprofitable or dangerous to do so," said **Walter Lippmann** in *A Preface to Morals*. Whoever seeks to maintain his integrity in the jungle of farce and posturing must be prepared to endure adversity. The Roman politician and historian of the Flavian and Antonine eras, **Publius Cornelius Tacitus** (c. 55-c. 120), has already written in his *Annals* that "even honor and virtue make enemies."

Honor differentiates us and makes us great. The defense of honor in the fight for professional integrity does not succeed from contemplative positions or postprandial speeches over a cup of coffee. **William Shakespeare** in *Hamlet* recommended action: "Rightly to be great is not to stir without great argument, but greatly to find quarrel in a straw when honor's at the stake." The sense of honor may have lost allies in a society with a shortage of knights; but, as **John Greenleaf Whittier** would say, "when faith is lost, when honor dies, the man is dead."

Medicine as knowledge for the preservation of health and a method of fighting to combat disease is subject to multiple pressures, both deleterious and subversive. The financing model for medical activity is obsolete, moving between slavery and anarcho-syndicalism. The servile attitude of the doctor to the pharmaceutical industry or the diagnostic industry distorts his professional role as a source of knowledge and reduces it to a commercial instrument. The health monopoly policy, in a prison market, is one of the worst enemies of professional progress. The latest events in public health, marked by the coronavirus pandemic, have uncovered many other holes in the health system, where health professionals were reduced to working at the service of political and sectarian interests, without any qualified professional reaction. Against this background, professional integrity takes on a special value and calls for changes that for some may be subversive. Advances in genomic medicine, which mark the irremediable step towards personalized medicine, represent a scientific and cultural revolution in the way of interpreting health and managing disease. Doctors of a certain age (and lazy youngsters) are falling behind in the face of the unstoppable progress of predictive medicine, based on anticipation that allows genomic prediction, molecular diagnosis and the personalization of drug treatment with the help of pharmacogenomics.

This new conjuncture requires long-term global reflection, such as that of **Franklin D. Roosevelt** on September 29, 1936 in Syracuse: "Wise and prudent men have long known that in a changing world worthy institutions can only be conserved by adjusting them to the changing time." Those wise and prudent characters, from the political, business and professional environment, are the ones who have to start turning the heavy wheel of change in health policy. To physicians, **Ralph Waldo Emerson's** advice should be valid: "Nothing is at last sacred but the integrity of your own mind. Absolve you to yourself, and you shall have the suffrage of the world."

Ramón Cacabelos
Professor of Genomic Medicine

Atremorine Capsules

Atremorine Powder

Powerful effect of Atremorine in the personalized treatment of Parkinson's disease

This month has seen the light of the most complete study carried out so far on the properties of Atremorine in Parkinson's disease. The study was signed by 15 authors from the EuroEspes Medical Center, led by Dr. Ramón Cacabelos, and has been published in the prestigious *Medicinal Research Reviews*, by the Wiley publishing company (IF: 9.3). Atremorine is the most sophisticated biotech product today for the prevention and treatment of Parkinson's disease. The study, carried out in newly diagnosed Parkinson's patients and in patients receiving treatment with conventional drugs, yields important conclusions: (i) Baseline blood dopamine levels in Parkinson's patients at the time of diagnosis are below 20 pg/mL; In contrast, 40% of patients treated with classic anti-parkinsonian medication show dopamine levels above 200 pg/mL. Women have lower dopamine levels than men. (ii) 97% of patients respond within one hour to a single 5 g dose of Atremorine orally, with no side effects. This response varies in intensity depending on the sex, the dose and the pharmacogenetic profile of each patient. The optimal response is seen in a dose-range of 5 to 20 g of Atremorine. (iii) Patients who have never been treated and take Atremorine for the first time, experience an increase in dopamine levels from 12 pg/mL to 6400 pg/mL; and patients chronically treated with other anti-parkinsonian agents show an increase of 1,300 to 16,000 pg/mL following Atremorine administration. This spectacular response demonstrates the powerful effect of Atremorine - enhancing the activity of conventional anti-parkinsonian drugs, which allows for the dose of these drugs to be reduced to avoid toxicity and side effects while preserving their therapeutic action. (iv) Atremorine also increases the levels of other neurotransmitters, such as norepinephrine and epinephrine, without affecting serotonin or histamine. Likewise, Atremorine regulates hormones that, at the suprahypothalamic level, are modulated by neuronal dopamine. (v) The variation in the dopamine response to Atremorine in men and women is strongly regulated by pharmacoepigenetic factors. (vi) The various polymorphic variants inherited by Parkinson's patients in terms of pathogenic genes associated with Parkinson's (*SNCA, NUCKS1, ITGA8, GPNMB, GCH1, BCKDK, APOE, LRRK2, ACMSD*), mechanistic genes related to the mechanism of action of drugs, metabolic genes responsible for drug metabolism and elimination (*CYP2D6, CYP2C9, CYP2C19, CYP3A4/5, NAT2, CYP1B1, GSTP1, SOD2*), genes encoding transporter proteins (*ABCB1*) -especially noradrenaline transporters (*SCL6A2*), dopamine (*SLC6A3*) and serotonin (*SLC6A4*) - and several pleiotropic genes, are largely responsible for the intensity and duration of the effect of Atremorine in treated patients. general, normal metabolisers (NMs) show a better response than

intermediate metabolisers (IMs), poor metabolisers (PMs) and ultra-rapid metabolisers (UMs). The genetic defects present in the pathogenic genes determine the severity of the disease and the response to drugs. (vii) The epigenetic mechanisms that regulate gene expression are profoundly altered in Parkinson's disease. Parkinson's patients exhibit low levels of global DNA methylation, and Atremorine is capable of reversing this hypomethylation profile by more than 90%, normalizing global DNA methylation. (viii) This effect makes Atremorine the first epinutraceutical agent with neuroprotective activity in Parkinson's disease. (ix) Atremorine crosses the blood-brain barrier and enters brain tissue. The effect of Atremorine on the brain is observed in the first hour of treatment. In more than 60% of cases, the effect lasts 6 to 12 hours with a single 5 g dose of Atremorine. (x) All these properties make Atremorine a powerful dopaminergic neuroprotective agent, with epigenetic activity, and dual, prophylactic and therapeutic response, under personalized treatment criteria, as demonstrated by the dopamine response to Atremorine based on the individual pharmacogenetic profile of each patient.

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The FDA approves Aducanumab (Aduhelm®) for the treatment of Alzheimer's disease

This month the ***U.S. Food and Drug Administration*** (FDA) approved the use of the antibody **Aducanumab** (Aduhelm®), launched by the company Biogen, for the treatment of Alzheimer's disease. This antibody has been designed to remove deposits of β-amyloid protein that, over years, accumulate in senile plaques that invade the brains of Alzheimer's patients. The interest in this antibody is based on its potential anti-amyloid property in early Alzheimer's cases or in asymptomatic cases, for preventive purposes. It is administered as a monthly injection, with an annual cost of more than € 40,000 per patient per year.

The approval of Aducanumab by the FDA has sparked considerable controversy in the scientific community because the same product had been previously rejected; in a small number of cases treated with doses higher than those established in the first clinical trials, a certain positive effect was seen. Reanalysis of the data by the company that owns the patent and a new application for approval to the FDA, with political and media pressure from the association of relatives of Alzheimer's patients in the United States, have forced the FDA to make this concession. This decision followed a period of 20 years where the regulatory agency did not approve a single new drug for this disease that affects 50 million people worldwide, with an average cost of € 15,000 to € 24,000 per patient and year in direct and indirect costs. The price of Aduhelm® would almost triple the current costs of the disease and it is estimated that public financing of this treatment will not be easy or universal. Furthermore, it is expected that the efficacy of this new therapeutic modality will not reach even 10% of Alzheimer's cases.

Dr. Juan C. Carril

Director of the Department of Genomics and Pharmacogenomics

Complete Sequencing of the Human Genome

The Department of Genomics and Pharmacogenomics, headed by Dr. Juan C. Carril, has set up a Genomic Sequencing Unit for the complete sequencing of the Human Genome using NGS (*Next-Generation Sequencing*) technology. The complete sequencing of the genome makes it possible to detect anomalies in gene structure (Exome) and to predict the risk of suffering from genetic diseases of Mendelian or polygenic origin. With this technology, more than 20,000 genes that make up the human genome can be sequenced. The Department of Genomics at the EuroEspes Medical Center incorporates predictive diagnosis and diagnostic confirmation by NGS to all pathologies associated with genetic defects, at any age, with special emphasis on prevalent pathologies that represent 80% of morbidity and mortality in developed countries, such as cardiovascular diseases, cancer and CNS disorders.

The Genomic Sequencing Unit is directed by Dr. Óskar Martínez de Ilárduya Ruiz de Larramendi, a NGS expert with extensive experience in the development and implementation of genomic sequencing processes.

Dr. Óskar Martínez de Ilárduya Ruiz de Larramendi

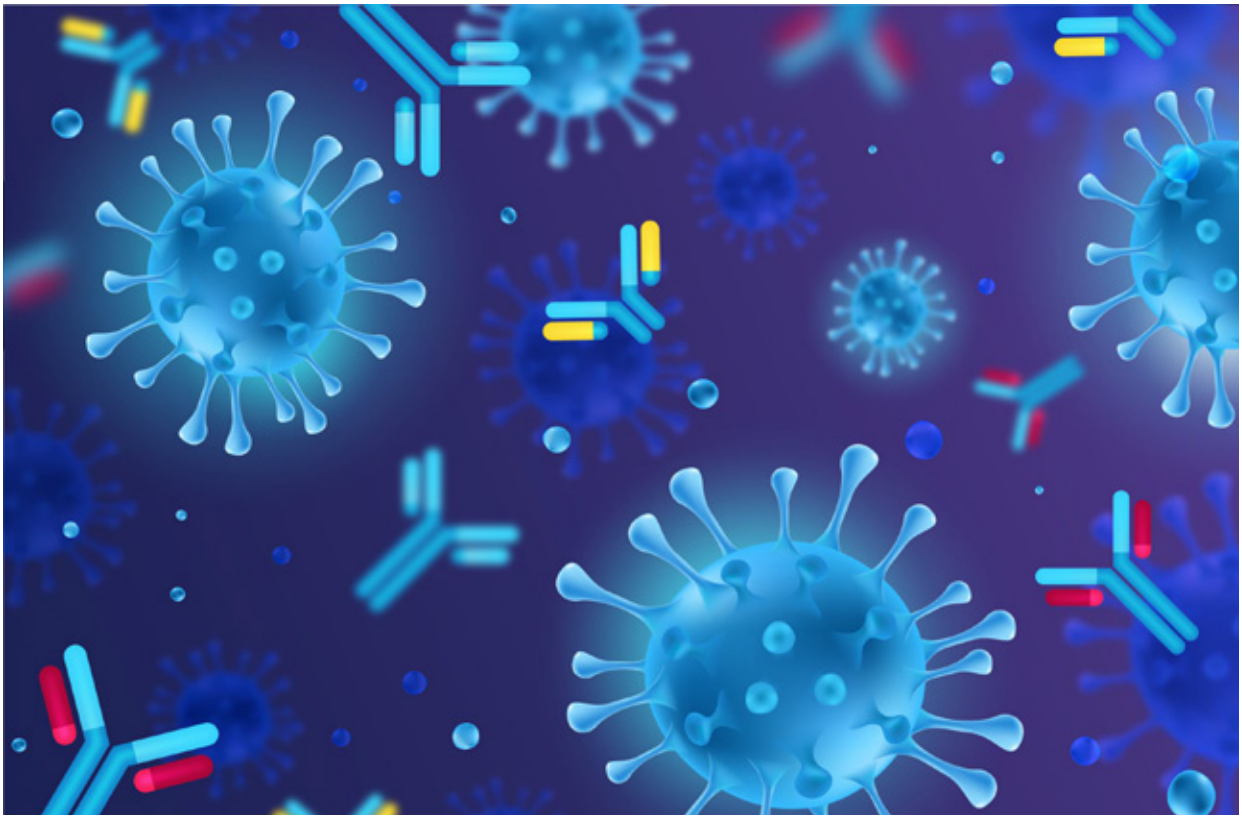
Head of the Genomic Sequencing Unit

Covid-19 News

Vaccination is not enough to be protected against COVID-19

According to official sources, more than half of the European population has already received at least one dose of some of the 8 anti-COVID vaccines approved by the World Health Organization. It is important to point out to the authorities, health professionals and vaccine users that simply being vaccinated does not guarantee protection against the risk of coronavirus infection. This is due to the fact that at least 40% of the population do not respond to vaccines. The purpose of vaccines is to generate antibodies against SARS-CoV-2; however, nearly half of vaccinated people show no significant response in the level of antibodies; 20% do not respond at all and another 20% have antibody levels below 100 U/mL. An infected patient develops antibody levels ranging from 20,000 to 80,000 U/mL that gradually decline throughout the year, eventually falling below 200 U/mL after 12 months. Many of these patients are re-infected due to lack of immune protection. 25% of COVID-19 cases are asymptomatic, with antibody levels below 10,000 U/mL. Asymptomatic cases have significantly lower antibody levels than symptomatic cases, indicating that their immune response is less aggressive.

These data are sufficiently clear so that the authorities do not negligently advocate that vaccination solves the issue. If there are no antibodies there is no protection; and it would be disastrous for public health if 40% of those vaccinated were flaunting a vaccination passport, as a political-vacation key, at the risk of becoming infected and being a source of collective infection.



Side Effects of COVID-19 Vaccines

As the vaccination rate increases, a greater number of cases with side effects (some serious and fatal) illustrate the adverse effects of each of the vaccines in free circulation (see side effects of anti-COVID-19 vaccines in the May 2021 (volume 12) publication of the EuroEspes Medical Bulletin. Just as there is daily propaganda about vaccinated cases, due to political imperative and submissive journalism, there should be a daily report of the side effects and deaths caused by vaccines, with complete transparency. In the media, figures for rigorous medical monitoring of the positive and negative effects of each vaccine, imposed on the population without medical consensus, are required rather than spokesmen for the kingdom.

The prophylactic and toxic effects are unique to each vaccine and each patient, depending on the properties of the vaccine and the immune response capacity of the patient, without homogeneous universal rules for the entire population.

We have been pointing out, for a year now, that vaccination policy should follow medical and not political criteria, precisely to avoid the current concealing of information about vaccines. Government authorities can create the laws that interest them and exempt themselves from responsibilities, but it is not morally acceptable for the central or regional governments to decide who should and should not be vaccinated. This is a medical responsibility; For this reason, doctors are the ones who have the obligation to know the properties of each vaccine and the characteristics of the candidates to be vaccinated. That is why vaccination should not be a sporting event or a political pilgrimage, but rather a medical act performed in health centers under the supervision and criteria of doctors who, in their respective positions, have identified the population, with their diseases, their risks, their treatments, etc. There are rules for administering any vaccine (including the flu vaccine) that are systematically violated in COVID-19 vaccination, as if these vaccines lacked risk or their risk and mortality had to be assumed by statistical criteria. Deaths and side effects are governed not by national statistics, but by the individual or family who must deal with the problem.

We hope that, following this period of panic and collective overwhelm, the health and autonomous authorities will use their common sense and contemplate directing anti-COVID vaccination to health centers and public and private hospitals, where it should have been from the beginning to avoid abuse, excesses, irresponsibility, inappropriate use, unnecessary mishaps and some avoidable deaths.

DefenVid enhances the immune response in vaccinated people with low levels of antibodies

Since the beginning of this pandemic, we have proposed the use of DefenVid to boost immunity against a possible coronavirus infection. DefenVid's immunoenhancing effect has been demonstrated in a number of studies, both in natural conditions and in situations involving various types of immunodeficiencies. With this strategy, we achieve a very low level of contagion or active cases of COVID-19 among our patients and, fortunately, today, we can say that we have not had to experience the misfortune of a single death from coronavirus.

In the studies carried out systematically in our Clinical Analysis Laboratory, we examine the level of antibodies in our patients, vaccinated and unvaccinated. In patients with low antibody levels, we recommend the use of DefenVid to enhance the immune response. Preliminary studies of this strategy, which has been implemented since the availability of vaccines, and the ability to reliably quantify the antibody titer, have confirmed that taking DefenVid in doses ranging from 500 to 750 mg / day increases the production of anti-SARS-CoV-2 antibodies in patients who have had a poor response to anti-COVID vaccines.

The New Nomenclature of Coronaviruses

Once viruses come into contact with the host, whether as a result of the immune response or a pharmaceutical attack, they mutate in order to escape the aggression that puts them in danger. The coronavirus is no exception and since the first variant in Wuhan (China), other variants have appeared in the United Kingdom, Brazil, and India, and others are emerging in different geographical latitudes, with varying degrees of invasive capacity or danger to the population. To avoid confusion, the World Health Organization (WHO) has established a new nomenclature to standardize the names of SARS-CoV-2 variants, which we make available to our readers in its original version, as presented by the WHO. The naming of these variants is based on the genomic profile of the virus.

Dangerous variants of SARS-CoV-2

WHO mark	Pango Lineage	Clade / Lineage from GISAID	Nextstrain Clade	First documented samples	Denomination date
Alpha	B.1.1.7	GRY (formerly GR / 501Y.V1)	20I (V1)	United Kingdom, September 2020	December 18, 2020
Beta	B.1.351	GH / 501Y.V2	20H (V2)	South Africa, May 2020	December 18, 2020
Gamma	P.1	GR / 501Y.V3	20J (V3)	Brazil, November 2020	11 January, 2021
Delta	B.1.617.2	G / 478K.V1	21st	India, October 2020	VOI: April 4, 2021 VOC: May 11, 2021

Variants of interest

WHO mark	Pango Lineage	Clade / Lineage from GISAID	Nextstrain Clade	First documented samples	Denomination date
Epsilon	B.1.427 / B.1.429	GH / 452R.V1	21C	USA, March 2020	5 Mar 2021
Zeta	P.2	GR / 484K.V2	20B / S.484K	Brazil, April 2020	March 17, 2021
Eta	B.1.525	G / 484K.V3	21D	Various countries, December 2020	March 17, 2021
Zeta	P.3	GR / 1092K.V1	21E	Philippines, January 2021	10 March, 2021
Iota	B.1.526	GH / 253G.V1	21F	USA, November 2020	10 March, 2021
Kappa	B.1.617.1	G / 452R.V3	21B	India, October 2020	April 2021
Lambda	C.37.	GR / 452Q.V1	20d.	Peru, August 2020	June 2021

Genetics of COVID-19 Lung Risk: Sex Matters

In 2020, the Department of Genomics and Pharmacogenomics, led by Dr. Juan C. Carril, made the COVID-19 GenoPredictor available to users of the services of the EuroEspes Medical Center, and to the national and international community, to identify the population at risk of suffering serious respiratory complications from COVID-19, as well as a pharmacogenetic profile to personalize the treatment of those who had to be admitted or needed outpatient treatment.

Data derived from the number of patient's cases studied, identified with the COVID-19 GenoPredictor, indicate that there are important genetic differences between men and women susceptible to lung damage by SARS-CoV-2. Analysis of the genetic variants of the *ACE2* gene, which acts as a receptor for the spike glycoprotein of the human coronavirus (HCoV-NL63) and the severe acute respiratory syndrome coronaviruses (SARS-CoV, SARS-CoV-2 of COVID-19), shows that 87.80% of men have severe lung risk in case of infection; 69.45% of women would have a severe risk; 22.22% an intermediate risk; and only 8.33% would be potentially risk-free.

The analysis of the other risk gene (*TPMRSS2*) reveals that 27.27% of the population would have a severe risk of lung disease in the case of COVID-19, 51.95% an intermediate risk, and 20.78% would be potentially risk-free (this figure corresponds to the percentage of asymptomatic cases). By gender, men also have a higher genetic risk, according to the variants of this gene. 31.71% of men could have a severe risk (27.27% women), 51.22% an intermediate risk (similar in women, 52.79%), while 25% of women would have little risk of lung damage compared to only 17% of men.

The genetic profile of these two genes (*ACE2, TPMRSS2*) suggests that the pulmonary risk in case of COVID-19 is substantially higher in men than in women.

EuroEspes creates a prestigious Ethics Committee

The EuroEspes Board of Directors, chaired by Dr. Ramón Cacabelos, has approved the creation of an Ethics Committee to serve the scientific community in the evaluation of research projects and for the study and analysis of professional activities in the field of health that requires reflection and expert advice under the umbrella of bioethics. This Ethics Committee is made up of distinguished personalities from different fields of knowledge, from legal, medical and biological sciences to theology, as well as users of the services of the International Center for Neurosciences and Genomic Medicine, who will elect their own governing body through a vote of its members.

The Ethics Committee of EuroEspes is made up of the following people: Juan Manuel Ruíz-Liso (Doctor, President of the Scientific Foundation of Caja Rural Soria), Segundo Leonardo Pérez López (Theologian, Ex Dean of the Cathedral of Santiago), Francisco López-Muñoz (Doctor, Vice-Rector of Research, UCJC), Igor Pinedo (Lawyer, Specialist in Health Law), Javier Casal (Lawyer, Head of Legal Services), Pedro Fuente (Businessman, Vice-president of EuroEspes), Pedro Jaén (Doctor, Dermatologist), Luís García-Mañá (Former Senator of Spain, Former Superior Chief of Police of Galicia), Ángel Riesgo (Economist, EuroEspes Counselor), Purificación García (Lawyer, Former Vice-Rector, UCJC), Juan Carlos Carril (Biologist, Head of Department Genomics), Joaquín Guerra (Doctor, Head of Neuro-Otolaryngology Unit), Carlos Sevillano (Doctor, Head of Neuro-Ophthalmology Unit), Eusebio Rey (Businessman), Manuel Díaz-Illanes (Agricultural Engineer), Vinogran Naidoo (Biologist, Head Basic Neuroscience Department) and Natalia Cacabelos (Philologist, Head of the Medical Documentation Department).

Editorial News

Dr. Ramón Cacabelos has been appointed to the ***Editorial Boards*** of the ***Trends in Geriatric Healthcare*** journal of the Scholars Direct publishing house, based in Oakland, California, USA, and the ***Pharmacogenomics Research and Personalized Medicine*** journal, directed by Drs. Hong-Hao Zhou and Zhaoquian Liu, from the Xiangya Hospital of the Central South University in Changsha, China, and Dr. Howard L. McLeod from the Moffitt Cancer Center in Tampa, Florida, USA

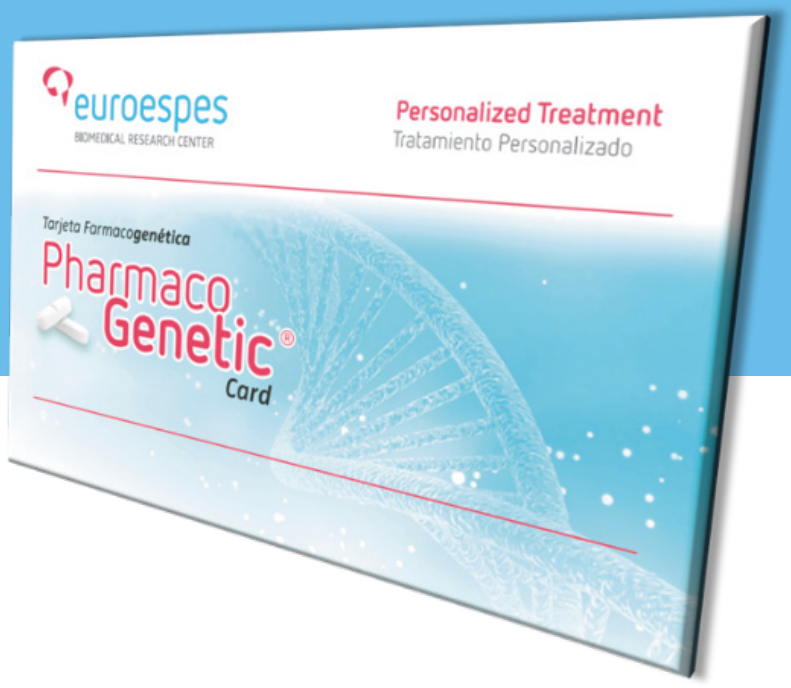
Promotional Section

Alzheimer's Prevention Plan (APP) Home and Face-to-face

The APP identifies populations at risk of Alzheimer's disease (AD) and discriminates against other memory disorders and other forms of dementia. As the initial component of the APP is the identification of the genetic risk, in order to avoid unnecessary costs and discomfort due to the displacement of people, we have established a dual APP: (i) Home APP to perform genetic tests on a saliva sample that the interested person sends to the EuroEspes Medical Center with no need to travel; and (ii) face-to-face APP for those who wish to complete a complete diagnostic protocol, including genetic tests, at our Medical Center. Those people whose home APP detects an obvious risk can later join the face-to-face APP to complete the diagnostic set and enter the personalized prevention program through pharmacogenetic intervention.

Parkinson's Prevention Plan (PPP) Home and Face-to-face

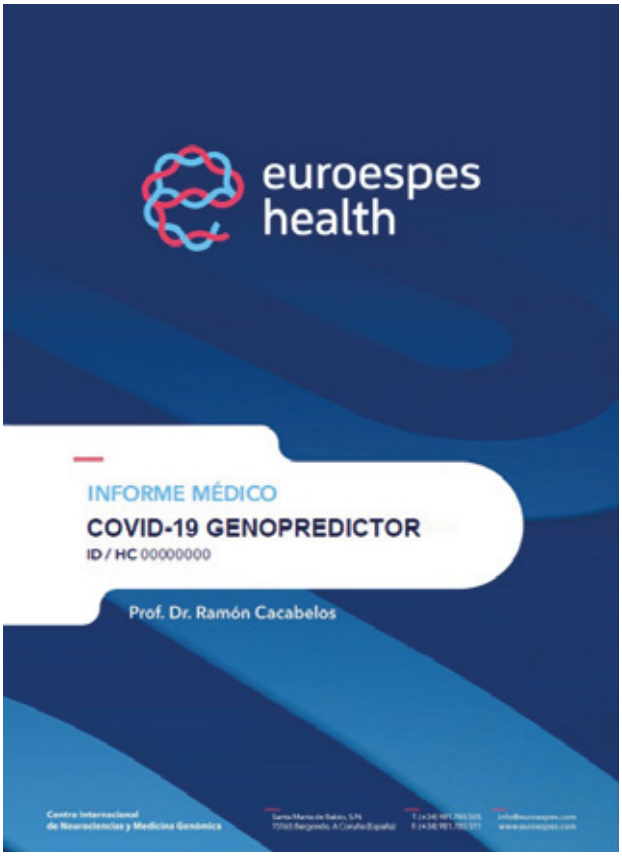
The PPP identifies the population at risk of suffering from Parkinson's disease, differentiating familial Parkinson's disease and other forms of parkinsonism (vascular, toxic or traumatic). The PPP also includes (i) a home PPP for all those asymptomatic people with a family history of Parkinson's or who detect incipient symptoms of tremor, rigidity or bradykinesia; and (ii) a PPP in person at the EuroEspes Medical Center where they would carry out the complete diagnostic protocol, including genomic screening. Patients following the home regimen who show genetic or environmental risk for Parkinson's would take the in-person PPP to complete the diagnostic set, and start the personalized prophylactic plan according to their pharmacogenetic profile.



Smart Pharmacogenetic Card PGx-60/4000

The most advanced bioinformatics product in the world with its personalized pharmacogenetic profile:

- to know the medicines you can take and which you should not take
- so that your doctor knows which drugs to prescribe and which drugs harm you
- to avoid toxicity and side effects when you have to take medication for any health problem
- to avoid life-threatening drug interactions if you have to take several medications simultaneously for long periods of time
- to avoid unnecessary expenses on products that are not useful to you
- to preserve your health with the appropriate medication for your genomic profile
- for the health of their children, who share 50% of their genome
- for life, because your genome does not change



COVID-19 GenoPredictor

The COVID-19 GenoPredictor is the only genetic test in the world that allows predicting vulnerability to SARS-CoV-2 infection with potential lung damage, immunological status and immune response capacity to coronavirus infection, and pharmacogenetic profile that allows us to personalize the pharmacological treatment appropriate to the genome of each person in case of need for treatment.

Carrying out this genomic test is recommended for people at high risk (heart disease, lung disease, hypertension, diabetes, stroke, cancer, immunosuppressed), people exposed by the nature of their work (high public attendance centers, frequent trips), people with a family history of risk, people infected by coronavirus and health personnel.

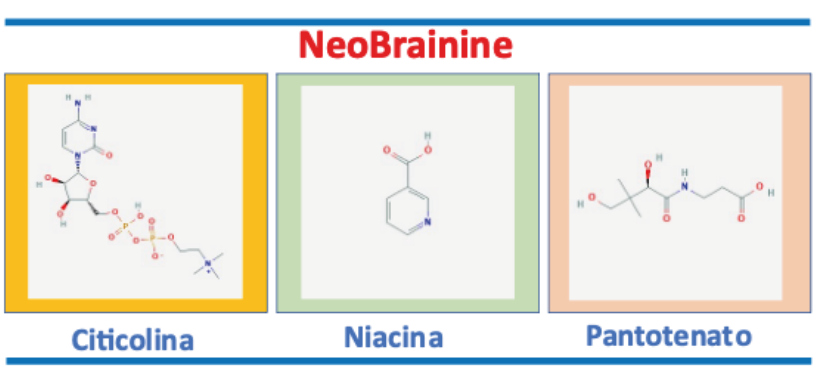
NeoBrainine

NeoBrainine is a new neuroprotective product for the prevention and treatment of various types of dementia and cerebrovascular risks (migraine, cerebral ischemia, thromboembolic events, stroke). NeoBrainine is a hybrid bioproduct, created by the team of scientists led by Dr. Ramón Cacabelos, that integrates citicoline, pantothenic acid and niacin molecules. Citicoline is a choline donor, acetylcholine precursor -an essential neurotransmitter for memory-; it is an essential component of the phospholipids of neuronal membranes and is an intermediate metabolite in nucleotide synthesis.

Pantothenic acid (D (+) - N- (2,4-dihydroxy-3,3-dimethylbutyryl) β-alanine) is an amide between pantoic acid with β-alanine; it is a water-soluble vitamin of the B complex, also known as vitamin B_5 or vitamin W, essential for life. Pantothenic acid is a fundamental cofactor in the synthesis of coenzyme A (CoA) and in the metabolism and synthesis of carbohydrates, proteins and fats.

Niacin or nicotinic acid ($C_6H_5NO_2$) is another water-soluble vitamin of the B complex (vitamin B_3, vitamin PP) involved in cell metabolism as part of the coenzyme NAD (nicotine-adenine-dinucleotide) and NAD-phosphate (NADP). Its derivatives (NADH, NAD+, NADPH, NADP+) are essential in energy metabolism and in DNA repair. Its main amide is nicotinamide or niacinamide ($C_6H_6N_2O$). Niacin is essential in the synthesis of steroid hormones and in the elimination of toxic xenobiotic agents.

The components of NeoBrainine (Citicoline, Niacin and Pantothenic Acid) exert essential neuroprotective functions for the normal functioning of the central nervous system.



Atremorine capsules

Atremorine has been approved by the European Patent Office for the prevention and treatment of Parkinson's disease.

In its usual presentation, Atremorine is dispensed as a powder to take with yogurt or other similar food, but not with water or liquids that can oxidize it or alter its properties. To avoid the use of powder and to facilitate the intake of Atremorine, EuroEspes Biotecnología (Ebiotec) launches Atremorine in capsules. The new presentation is now available nationally and internationally.

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DefenVid-90

EuroEspes Biotechnology (Ebiotec) launches a new presentation of DefenVid with 90 capsules. This new presentation covers a complete monthly treatment regimen. Ebiotec continues to maintain the presentation of 30 capsules.

DefenVid is an immunity enhancer epinutraceutical to combat immunodeficiency states or the fall in natural defenses associated with the use of antibiotics for bacterial infections or chemotherapeutic agents in cancer patients.

DefenVid is a powerful enhancer of cellular immunity at any age against viral infections.

The two presentations of 30 and 90 capsules are already available nationally and internationally.

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Complete Sequencing of the Human Genome

The team of geneticists from the Department of Genomics and Pharmacogenomics, led by Dr. Juan C. Carril and Dr. Óskar Martínez de Ilárduya Ruiz de Larramendi, Head of the Genomic Sequencing Unit, make available to users of medical services from the International Center for Neurosciences and Genomic Medicine, as well as from the national and international medical and scientific community, a service specialized in the complete sequencing of the human genome (> 20,000 genes) with NGS technology.

DermoGenetics Catalog

The Genomics and Pharmacogenomics Department of the EuroEspes Medical Center offers doctors and specialists in Dermatology the EuroEspes DermoGenetics Catalog. The Catalog includes the 1000 most relevant genes in skin diseases, from allergic reactions to skin cancer. This is the first Dermogenetics Catalog available in Europe.

Home Care: COVID-19 and Genetic Testing

Following our Community Care policy, facing the COVID-19 crisis, mobility restrictions in various national territories, and the difficulties of displacement of our national and foreign patients, the International Center for Neuroscience and Genomic Medicine has established a Home Care Service to our patients, to individuals and companies to carry out COVID-19 tests (PCR, Antigens, Antibodies) and genetic tests (see catalog at www.euroespes.com).

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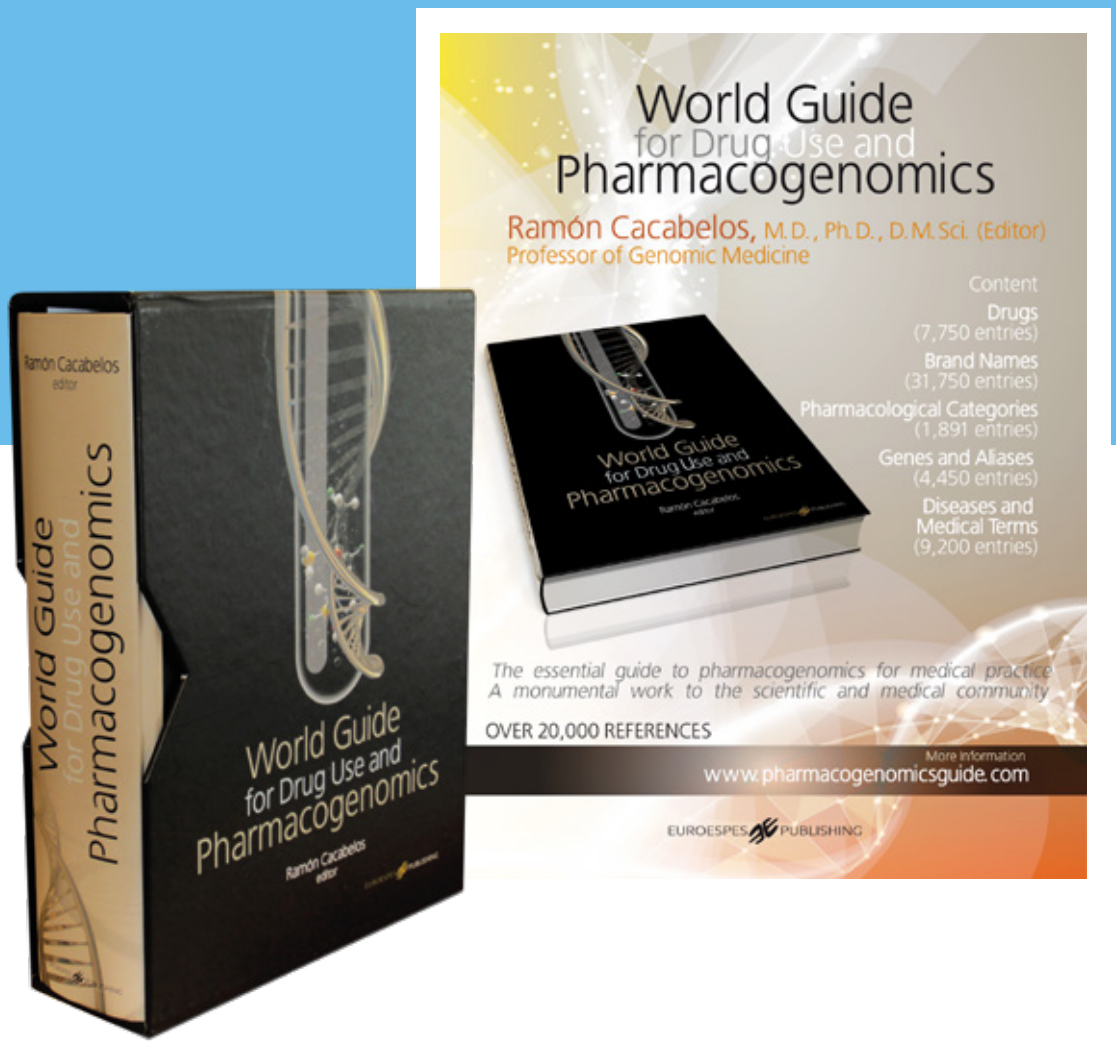

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