Gastroenterol Hepatol. 2020;43(9):540–550

Gastroenterología y Hepatología

www.elsevier.es/gastroenterologia

SPECIAL ARTICLE

Tips and guidelines for being a successful researcher☆

Javier P. Gisbert*, **María Chaparro**

Servicio de Aparato Digestivo, Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBEREHD), Madrid, Spain

Received 17 February 2020; accepted 16 March 2020
Available online 14 November 2020

KEYWORDS
Investigation;
Researcher;
Success;
Successful;
Mentor

Abstract This article aims to share our experience with those who consider dedicating themselves to research. In this way, the characteristics, qualities or competences that, in our opinion, a good researcher should fulfil are listed, and therefore the keys that can help you achieve a successful research career. The intention of this article is not to simply list a series of theoretical recommendations but to share some personal suggestions based on our experience and, therefore, of an eminently practical nature.

The fundamental qualities to be discussed are: Ethics and honesty. Curiosity, passion, enthusiasm and motivation. Persistence, dedication and discipline. Ambition and leadership. Compromise and responsibility. Organisation and planning. Acquire knowledge of research methodology. Critical and positive attitude towards difficulties and failure. Prioritisation of objectives and time management. The importance of a good mentor. Establishment of a network of collaborators and teamwork. Maintain a balance between clinical and research activity. Combine public and private investigation. Balance between professional and personal life. And, finally, humility, generosity and thanks.

Research represents a fundamental pillar of medical activity and it is evident that the highest quality of care arises from the integration of excellent clinical practice and research activity. With the philosophy that most of the qualities to develop an excellent research activity depend on attitude, and can be learned, developed and improved, in this manuscript we share with the reader a series of recommendations that we consider essential to be a good researcher.
© 2020 Elsevier España, S.L.U. All rights reserved.

☆ Please cite this article as: Gisbert JP, Chaparro M. Reglas y consejos para ser un investigador de éxito. Gastroenterol Hepatol. 2020;43:540–550.

* Corresponding author.
E-mail address: javier.p.gisbert@gmail.com (J.P. Gisbert).

2444-3824/© 2020 Elsevier España, S.L.U. All rights reserved.

PALABRAS CLAVE
Investigación;
Investigador;
Éxito;
Exitoso;
Mentor

Reglas y consejos para ser un investigador de éxito

Resumen Este artículo tiene como objetivo compartir nuestra experiencia con los que se plantean dedicarse a investigar. Así, se enumeran las características, cualidades o competencias que, a nuestro criterio, un buen investigador debería cumplir, y por tanto las claves que pueden ayudarle a lograr una carrera investigadora exitosa. La intención del presente artículo no es enumerar sin más una serie de recomendaciones teóricas, sino compartir algunas sugerencias personales basadas en nuestra experiencia y, por tanto, de índole eminentemente práctica.

Las cualidades fundamentales que se tratarán son: Ética y honestidad. Curiosidad, pasión, entusiasmo y motivación. Persistencia, dedicación y disciplina. Ambición y liderazgo. Compromiso y responsabilidad. Organización y planificación. Adquirir conocimientos sobre metodología de la investigación. Actitud crítica y positiva ante las dificultades y el fracaso. Priorización de objetivos y gestión del tiempo. La importancia de un buen mentor. Establecimiento de una red de colaboradores y trabajo en equipo. Mantener un equilibrio entre actividad clínica e investigadora. Combinar investigación pública y privada. Equilibrio entre la vida profesional y personal. Y, finalmente, humildad, generosidad y agradecimiento.

La investigación representa un pilar fundamental de la actividad médica y es evidente que la mayor calidad asistencial surge de la integración de una práctica clínica y una actividad investigadora excelentes. Con la filosofía de que la mayoría de las cualidades para desarrollar una actividad investigadora de excelencia dependen de la actitud, y pueden aprenderse, desarrollarse y mejorarse, en el presente manuscrito compartimos con el lector una serie de recomendaciones que consideramos esenciales para ser un buen investigador.
© 2020 Elsevier España, S.L.U. Todos los derechos reservados.

Introduction

Research is an activity aimed at obtaining new knowledge and applying it to solve problems or questions of a scientific nature. Human beings produce what we call knowledge through research. Scientific research, in particular, uses the scientific method to study a given aspect of reality, either theoretically or experimentally. Or to put it more graphically, and as Laplace said, investigating – and discovering – is bringing two separate ideas closer together.

A researcher is someone who implements a project aiming to pursue knowledge and to clarify facts and relationships. Another definition of a researcher is a person who creates original knowledge.[1] As Louis Pasteur so graphically put it: ''If I do not know something, I will investigate it.''

The specific objectives of a researcher vary depending on the nature of the research, although generally speaking, we might say that the main objective is always to judge, review, evaluate, check and draw conclusions about an initial approach or a given hypothesis. ''Millions saw the apple fall, but Newton was the only one who asked why.'' (Bernard M. Baruch). Thus, researchers apply the scientific method to learn more about a given reality or to find solutions to a problem. ''Investigating is seeing what everyone has seen and thinking what nobody else has thought.'' (Albert Szent).

The role of researchers is essential in a society that values knowledge and seeks to develop in scientific, technological and humanistic terms. Without researchers there would be no way of accumulating specialised knowledge that can translate into practical applications of any kind: medical, industrial, social, etc. ''The fun in science lies not in discovering facts, but in discovering new ways of thinking of them.'' (William Lawrence Bragg).

In the specific field of medicine, research is undoubtedly a cornerstone of medical activity. Thus, the triad of medical activity par excellence is comprised of healthcare, teaching and research. One might say that the stool of the medical profession is unstable – incomplete – if one of its legs is missing. In this way, research must be regarded as another part of the healthcare process, an intervention strategy which, instead of acting directly, analyses and studies health problems for which the causes or solutions are unknown. Therefore, research is not only desirable, it is necessary for the healthcare system to operate properly. In summary, greater healthcare quality emerges from the integration of excellent clinical practice and investigative activity.

Unfortunately, our doctors lack investigative training. Although ideally the importance of research should be inculcated as early as the first year of medical school, the teaching content dedicated to research during a medical degree is marginal (although it is true that final dissertations, albeit only in the last year of the degree, have heralded an advance in this regard). This training gap is not even addressed during specialised training. And this deficit is rendered even more patent once a doctor has completed their speciality, at a time when they are even less predisposed to get involved in aspects they are not familiar with and ongoing research-related training is conspicuously absent.

Another circumstance that further compounds the problematic situation of research in our country is the scant institutional awareness and support. Despite being the

fourth most important economy in the European Union, Spain has a long-standing, pitiful record of lack of funding for research and development (R&D) plans. Never in the country's history has more than 1.5% of the GDP been allocated to research, way below the European Union average (2%) and placing our country as the fourth lowest investor in R&D of all the Organisation for Economic Cooperation and Development (OECD) countries.[2] This partly explains why at this moment in time competition to obtain funding for research purposes in Spain is fiercer than ever.[3] For these reasons, it should come as no surprise to learn that research is in crisis and that the number of researchers, particularly in the field of biomedicine, is in continuous decline.[4]

In view of this background, it would seem clear that being a researcher at this moment in time, and even more so in our setting, is a veritable challenge. And a researcher needs be good – or better still, excellent – in order to have any chance of being successful. A researcher must have a set of competencies and skills.[1] The word competency is related to the words competent and compete: meaning that to be able to compete you must be competent and to be competent you have to compete.[1] Competency is also synonymous with capacity, attribute, skill or dexterity.[1] Acquiring competencies in research is a long and complex process, which includes various dimensions and formative stages, some of which begin – or should begin, at an early age.

It is true that some people are born with the skills or abilities needed to become a researcher. However, the other qualities – most of them – that are needed to be an excellent researcher depend on attitude. As Ramón y Cajal said: ''Every man can be, if he sets his mind to it, the sculptor of his own brain.'' In the same regard, we could recall the well-known maxim uttered by Thomas Edison: ''Genius is 1% inspiration and 99% perspiration.''

With this philosophy, the purpose of this manuscript is to share with the reader a set of conclusions derived from the experience that we regard as important for being (or becoming) a good researcher. We tend to refer to research in a broad sense, although by training our attention is always focused particularly on biomedical research and, even more specifically, on that which is performed by medical professionals who engage in a mixed professional activity, combining healthcare and research. In fact, most of the recommendations we will be give could be useful for any job.

The purpose of this article is to share our experience with anyone who wants to pursue a career in research. Thus, the characteristics, qualities or competencies that, in our opinion, a good researcher should have, and are therefore key elements that will help them to forge a successful career as a researcher, are listed below. That said, this article does not set out merely to list a set of theoretical recommendations, but to offer some personal suggestions based on our own experience, and which are therefore of highly practical nature. Evidently, it is difficult to find people who possess all these qualities. Some of them are part of a way of understanding life, others are innate, although, and we would insist upon this point, most of them can be learned, developed and improved.

Ethics and honesty

It is self-evident that ethical principles are essential to the proper development of any professional activity, and in research this is especially so. The researcher must comply with and transmit the fundamental ethical principles, in life in general and in science in particular: with patients in their care activity, with lectures in their teaching activity, and with studies in their research activity. Honesty and integrity are the most valuable and valued qualities of a leader.

Any research sets out to reach a goal that is established beforehand, a hypothesis that must be verified. Reaching an unwanted or unexpected outcome is still a finding, one that must be respected and not changed. ''No amount of experimentation can ever prove me right; a single experiment can prove me wrong.'' (Albert Einstein). Manipulating a result in order to achieve what we set out to do is obviously unethical. Ramón y Cajal said this much in his magnificent reflections entitled *Reglas y consejos sobre investigación científica* (Rules and Advice on Scientific Research): ''If the hypothesis does not conform to the facts, it must be rejected out of hand, and another reproach-free explanation devised. We should be severely self-critical, based on a mistrust of ourselves. During the verification process, apply the same diligence in searching for facts that could refute your hypothesis as well as those that can prove it. Avoid becoming over-attached to your own ideas, and look at them not as a lawyer, but as a prosecutor.''

Although it may seem self-evident, it should be stressed that, for intellectual honesty, the researcher should not change or modify the data; they should not change the meaning of what is expressed by other researchers they consult; and they should not pass off as their own the findings of those their research is based on. This all means acknowledging the merits of others and avoiding plagiarism. Being ethical and honest means pondering the contributions of each author fairly, without indulging in disproportionate criticism, and also being self-critical about the limitations of your own research. In summary, we should do our utmost to prevent that bitter reality expressed by Rousseau from coming true: ''There has never been a wise man who hasn't failed to prefer the lie invented by himself to the truth discovered by someone else.''

One of the greatest enemies of research is subjectivism, i.e. the tendency to modify or interpret research results according to personal desires or criteria that go against the research methodology. Be neutral towards knowledge, and avoid grounding your research on preconceived ideologies or ideas, although this is not always easy. As Albert Einstein said: ''It is easier to break an atom than a prejudice.''

Inquisitiveness, passion, enthusiasm and motivation

Engaging in research calls for a spirit of permanent inquisitiveness, observation and enquiry. ''What is a scientist after all? It is a curious man looking through a keyhole, the keyhole of nature, trying to know what's going on.'' (Jacques Yves Cousteau).

Passion is also a fundamental ingredient to be a good researcher. ''Science is not only a discipline of reason, but also of romance and passion.'' (Stephen Hawking). Without passion, many scientists might have given up along the way or never even felt the motivation to begin. Like so many other competencies, passion is essential, not only to research, but in any activity in life. As Payot asserted: ''Any great work, either in art or in science, is the outcome of a great passion dedicated to serving a great idea.''

A career in research is normally considered to be very tough and vocational. Vocation, according to the Oxford English Dictionary, is ''a strong feeling of suitability for a particular career or occupation''. Although there is no doubt that in some cases a person may feel an innate vocation for research from a very early age, in many others the passion for medicine and for research arises, little by little, through the practice of this activity. Thus, in many cases, a vocation is made (you are not born with it). If you do your job competently, you will often end up liking it. And if you enjoy doing something, you will probably be very good at it. ''The most productive work is that which comes from the hands of a happy man.'' (Víctor Pauchet). This twofold facet generates feedback in the researcher which, once again, highlights the importance of attitude in people. In the words of Ramón y Cajal: ''Many people often think that a mere slowness in learning and understanding is due to a lack of ability, and sometimes laziness or the lack of a secondary quality, such as patience, meticulousness or perseverance, attributes that can be quickly acquired through work and with the satisfaction of success.''

Enthusiasm is catching and is something that one should not only learn how to feel, but also to transmit (to our mentors, mentees and collaborators).[5] Thus, for example, in the field of science, it is stimulating to convey passion and excitement when making a research hypothesis (emphasising its novelty), when analysing the data obtained for the first time (stressing that it is original information), when presenting a results for the first time at a congress (in the hope that the audience's applause will be forthcoming) or when sending a manuscript to a good biomedical journal (in the hope that it will be accepted for publication). ''Years may wrinkle the skin, but to give up enthusiasm wrinkles the soul.'' (Albert Schweitzer).

The researcher investigates – or at least they should – first and foremost for the purpose of contributing to the advancement of science and to the benefit of society (and, in the case of medicine, of their patients). Evidently, other very different personal motives, such as the need to nurture our own self-esteem or the desire for recognition by other professionals, can sometimes also be a major spur for investigating and publishing. One final argument for investigating and publishing, less altruistic but no less capable of generating a stimulus, is the need to acquire a good professional *CV*. This may not strike us as very important at a given point, but it can eventually and ultimately become a key part of our professional future, enabling us to aspire to higher goals or attain a greater impact in our research. Since a good *CV* cannot be improvised overnight, but is rather the result of years of hard work, the sooner you start the better.[6]

Persistence, dedication and discipline

It has been suggested that two of the most important ingredients for being a good researcher are persistence and dedication, as they temper and channel enthusiasm.[7] Evidently, no research is possible without tenacity, without understanding that it is a process comprised of successive and consecutive steps. For this reason, it has been said that ''discipline is the most important part of success'' (Truman Capote). In fact, you do not need to have an ultrahigh IQ to be a good researcher; being tenacious is much more important. ''Your attitude, not your aptitude, will determine your altitude.'' (Zig Ziglar).

Perseverance and discipline will help you to maintain a high rate of work and scientific output for long periods of time, which is the key to lasting success in the world of research. ''Talent is quite common; it is not intelligence that is scarce, but perseverence'' (Doris Lessing). Although there will inevitably be ups and downs (in our personal and professional life), discipline will prevent them from taking over and above all from leading to lengthy periods of inactivity and the ensuing negative impact on our career as a scientist. ''Life is like riding a bicycle. To keep your balance you must keep moving.'' (Albert Einstein).

The breakthroughs that we have achieved in science, and particularly in medicine, thanks to research, did not come at the first attempt. The basic ingredient in any activity is to do it with dedication, and usually you need to fail several times before finding the right path. ''Science, my lad, is made up of mistakes, but useful mistakes to make, because they lead little by little to the truth.'' (Jules Verne). The secret does not lie in being perfect, but rather in persevering, although your dedication must also be efficiently guided towards the right goal. As Louis XIV pointed out: ''Perseverance is not always about doing the same things, but doing things that lead to the same goal.''

Frequently our endurance and our persistence will be put to the test by scientific inertia and immobility that sometimes delays the acceptance of new discoveries. Albeit perhaps in a rather exaggerated fashion, Max Planck wrote: ''A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.''

When we delve into the world of knowledge, we immediately realise that we know a lot less than we thought we knew. This learning should also give rise to new doubts. ''True science teaches, above all, to doubt and to be ignorant.'' (Miguel de Unamuno). These doubts, instead of being frustrating, should constitute a challenge and an invitation to continue with the research. ''Science never solves a problem without creating ten more.'' (George Bernard Shaw). You should never stop studying and learning: being a good researcher means that you never cease to learn.

In summary, the key (or at least one of the most important ones) to success, like everything in life, is: work, work and work! But you need to make your own luck. ''The only place where luck comes before work is in the dictionary'' (Donald M. Kendall). There is no doubt that some of science's most brilliant achievements can be put down to luck; but it is also

true that very often ''chance smiles not on those who want it, but rather on those who deserve it.'' (Duclaux).

As a corallary to this section, we would like to provide some quotations from our famous researcher Ramón y Cajal which are included in his *Reglas y consejos sobre investigación científica*, a book which bears the suggestive subtitle of ''Los tónicos de la voluntad'' (The tonic of the will). Therein, the great Spanish scientist wrote: ''In science, as in the lottery, luck favours he who wagers the most.'' He also asserted that ''work substitutes for talent, or better yet, it creates talent.'' Finally, he concluded that ''all great work is the fruit of patience and perseverance, combined with tenacious concentration on a subject over a period of months or years.''

Ambition and leadership

The researcher, like any entrepreneur, must be ambitious (in the good sense of the word). ''Shoot for the moon and if you miss you will still be among the stars.'' (Les Brown). Or, as Chris Dixon wrote: ''If you aren't getting rejected on a daily basis, then your goals aren't ambitious enough.'' However, while being ambitious, one must be realistic; objectives should be ambitious, but attainable. Carlos Richet said that ''the man of genius [in this case the researcher] combines the idealism of Don Quixote with the good sense of Sancho.'' It is not easy to strike the right balance between ambition and prudence, and it usually takes time and experience. ''If it excites you and scares you at the same time, it probably means you should do it!'' (Bob Proctor).

It is important to get out of our comfort zone and pose new (achievable) challenges continuously in order not to fall into routine and laziness. Our relationships with our colleagues are essential in helping us to come up with new ideas and projects. Spells at other research centres, ideally in other countries, can open up our eyes to other ways of organising research and also help us to become independent researchers.[8]

Ideally, ambition should be channelled and guided by leadership, which is the capacity to transform vision into reality. Leaders have (and communicate) a clear vision, and choose (and articulate) a precise direction. Leaders think and talk about solutions, whereas followers do the same, but about problems. Good leaders inspire, encourage and, only when necessary, impose discipline.[5]

Commitment and responsibility

Commitment and responsibility are, once again, essential characteristics, not only to be a good researcher, but to do any job competently. If you cannot commit to something, then you must know how to say no,[9,10] and this requires a certain learning process. Saying ''yes'' too much and too often can eventually jeopardise our scientific career. Firstly, because it is highly likely that we will be unable to make good on promises and our mentor/tutor/boss will not assign us any further responsibilities (with the subsequent loss of opportunities) if we have been unable to demonstrate that we are deserving of their trust; and secondly, because having to dedicate time to something that is not a priority will prevent us from progressing in the objectives that are truly relevant to our scientific development.

Therefore, researchers must be honest (with their superiors, collaborators and subordinates) about their limitations. Sometimes it is not easy, for example, to acknowledge that you not have enough time to write that review you have been tasked with at the last minute. However, it is always better to face up to a problem like that rather than committing to something that you will subsequently be unable to deliver. Another paradigmatic example is the inclusion of patients in a clinical trial, because we often make the mistake of wanting to take part in too many studies at the same time and commit to an unrealistic number of patients. The consequences of this are dire for everyone and obviously they will not go unnoticed by the study's principal investigator/sponsor, who will probably end up including the negligent researcher on the blacklist of ''candidates ruled out for future studies''. To avoid this, our Research Unit has designed a detailed *checklist* that enables us to select only the most suitable clinical trials; fundamentally from the patient' standpoint, but also with a view to avoiding redundancies and overlapping between studies, and thus guarantee that we will have enough candidates to fulfil our recruitment commitment.

Organisation and planning

A good researcher is characterised by their ability to organise the activities of their work and group through plans that they follow up on. It is essential to get used to working with deadlines, which should not be seen as something overwhelming that puts pressure on us, but as something that has been voluntarily chosen, precisely to meet the objectives in an orderly and relaxed manner It is important to agree in advance on a temporary calendar of objectives to be met, which will allow the different research activities to be properly programmed. ''A goal properly set is halfway reached.'' (Zig Ziglar).

Moreover, it is necessary to get used to planning not only in the short term, but, above all, in the medium and long term. It is essential to consider where you want to be in ''X number of years'' and think ahead about what you want to do (and how and by when) in the coming months and years, not just in terms of days or weeks. Obviously, having a clear plan helps the decision-making process.[8] ''When a man does not have his ideas in order, the more ideas he has, the more confused he will be.'' (Dale Carnegie).

Acquiring knowledge about investigative methodology

Research methodology is the name given to the discipline that documents, questions and organises the methods and procedures used in the different possible types of research, in order to create a specialised framework that can be used to train new researchers. It includes a broad spectrum of competencies on how to design a study, how to analyse and interpret it, how to publish it and how to communicate it at a conference. Enrolling in a research methodology training programme in the first few years of your activity as a researcher will enable you to develop the skills you need to

design, conduct, interpret, criticise and disseminate clinical research.[11] Just as it is unthinkable for a doctor to practice without having received the proper formal training (at medical school and during a residency), it is similarly inconceivable that a researcher can successfully work as such without having received some specific training.[12]

For example, it is important to have a minimal training in statistics – although you do not need to be an expert – as this will allow you to enjoy a certain degree of independence when analysing your own data. You can then go on to hone your scientific writing skills. Writing articles is an acquired skill, just like performing a colonoscopy. Basically, you learn with time and effort. The more you write, the easier it seems and the more you enjoy it.[13] The same applies to presenting the outcomes of a study at a scientific conference skilfully: mastering communication skills is essential, and they are also learned over time. Although acquiring all of these skills depends mainly on each researcher's interest and effort, having a good mentor undoubtedly makes this much easier.

Critical and positive attitude towards difficulties and failure

The profession of researcher is not always easy and can sometimes also be thankless. This is why the researcher must learn to live with success, but also, and above all, to cope with failure. ''Success is the ability to move from one failure to another with no loss of enthusiasm.'' (Winston Churchill). This means that you must not lose heart when you are finding it hard to move forward or when you are not obtaining the expected results. ''I always tried to turn every disaster into an opportunity.'' (John D. Rockefeller). A positive attitude in the face of adversity, when, for example, an article that was so difficult to write or a grant or research project we invested so many hours in preparing are rejected, is something that which – at least in part – can be learned. Developing a tolerance to frustration is vital: we need to be thick-skinned.[14]

A researcher must know how to be self-critical and also be open to feedback. We have to learn not to take critical comments from other researchers as something (too) personal and to share the philosophy that if we learn from our failures, we have not really failed. Thus, for example, when an article we write is rejected by a biomedical journal, we should take the reviewers' criticisms positively and make the most of the invaluable opportunity provided by the comments to improve both the article (and, above all, our future articles). Therefore, researchers should always maintain critical, but constructive frame of mind. They should not waste time complaining about things, but try to solve them instead. Thus, criticism should always be accompanied by the ensuing proposals for alternative solutions.

On another note, we should not be discouraged by the innumerable bureaucratic obstacles, which really represent a real obstacle course in our research. Even the most modest observational and respective study requires the approval of the Clinical Research Ethics Committee, classification by the Spanish Agency of Medicines and Medical Devices, approval of the local feasibility committee, and the signing of contracts with participating sites, etc. In the case of prospective observational studies (typically post-authorisation with medications), things can get even more complicated, requiring the approval of each and every one of the autonomous region committees involved, as well as the payment of the corresponding fees. Finally, in multicentre clinical trials, logistical complications (including obtaining funding, contracting insurance, managing the project and monitoring the sites) can end up turning an exciting idea into an impossible mission. If to this are added the difficulties in carrying out a proper statistical study (for which we have not usually received sufficient training) and in publishing the manuscript (with the usual multiple rejections), it is not surprising that only a small proportion of the research projects have a good outcome and are finally published. And it is precisely for this reason that success tastes even better after you have known failure. ''Failure is the condiment that gives success its flavour'' (Truman Capote).

But the difficulties with which the researcher has to contend do not end there. Researchers often have to deal with a lack of understanding on the part of the institution, which, although claiming the results as their own, does not support the research nor grant the time that needs to be dedicated to it, regarding it implicitly as something that the professional should do in their free time and, therefore, as something incidental. At times, the lack of understanding on the part of departmental colleagues, who sometimes think that ''research is our problem and a waste of time'' and that we should dedicate our free time to this, is the last straw

For research to be successful, the environment inside the institution (normally a hospital) must be a favourable one. The value of research must be recognised explicitly and be part of the hospital or university's organisational structure and an integral part of the necessary ongoing medical training. Thus, ideally, tasks and time dedicated to research should be formally – officially – acknowledged as part of a doctor's regular work. Otherwise, the research carried out by doctors will be regarded as a *hobby* rather than be seen as activity inherent in the medical profession.

All the difficulties mentioned above, despite being strictly true, should not be an excuse to give up and abandon the research field if you really like it and care about it. They are the rules of the game, you should not complain, but work to make change possible. ''If it's important, you'll find a way; if it's not, you'll find an excuse.'' (Ryan Blair). Even the most successful researchers have been plunged into existential vocational crises at some point and wondered whether it is really worth the effort. It is at these moments – when you feel that you're about to give up and really want to quit – when you must look back and remember why you started.

Prioritising objectives and time management

Time management (our own and that of our team members) is essential. Firstly, because it allows us to develop an efficient research activity; and secondly, because a lack of time can dramatically transform a pleasurable activity (research) into an unbearable one. One of the things that requires more time and effort is learning how to establish a hierarchy of objectives, or priorities. ''The hardest thing to learn in life is which bridge to cross and which to burn.'' (Bertrand Russell). And consequently, we need to learn to

say ''no''. We should choose only quality projects and not waste time with second-rate research. In this way, we should prioritise research projects that are more relevant as well as more feasible. ''Learn to say '*no*' to the good so you can say '*yes*' to the best.'' (John C. Maxwell).

Researchers must learn to select priorities in order to harness their efforts and resources. This means that they must be focused and not get distracted. As the saying goes, the researcher is often called upon to: *focus*, *focus*, *focus*![15] The vast majority of relevant contributions to science have been made by researchers who persisted in their endeavour, following a path of perseverance and tenacity. Or in other words, by focusing on finding answers to the important questions. All too often, less experienced researchers are tempted to jump from one thing to another that is seemingly more ''fun'' or more ''trendy'', which means they end up not delving into anything sufficiently and, as a result, they never become an expert in anything.[16] In other words, they become a ''Jack of all trades and master of none''. Time spent on irrelevant things prevents it from being invested in others that are relevant.

We should set aside time for research, and more specifically for writing articles.[17–20] Evidently, the first question we should ask ourselves when we are considering writing a manuscript is whether the article in question is really worth writing. Writing a manuscript is no easy task and it requires a great deal of effort. Therefore, before embarking upon such an undertaking, we should be convinced that the article deserves to be written so that it can stand a chance of being published.[21]

As Mafalda said: ''Often, what's urgent leaves little time for what's important.'' Having time to ''think and reflect'' is essential. Addressing new projects or thinking about possible organisational changes that are crucial for the future of our group calls for time and serenity. And this, in turn, means knowing how to delegate responsibilities to others. Lack of time on the part of the researcher is one of the most frequent barriers to the proper advancement of the entire research team. We should not confuse being busy with being productive, they are not the same thing.[10] A researcher may be an excellent scientist or academic, but if they do not have the time to reflect on the possibilities of improvement for themselves or their group and to rethink objectives and goals on a relatively regular basis, they are doomed to remain stuck in the present.

Preparing and giving talks and papers or conferences can be very time-consuming. ''There is one kind of robber whom the law does not strike at, and who steals what is most precious to men: time.'' (Napoleon Bonaparte). Time is finite and it does not expand like the noble gases. For this reason, although this is a very personal decision, we believe that you must be very demanding with regard to the conference talks you choose to give, prioritising only those with greatest impact and dissemination (for example, at national congresses or, better still, international events). The same applies to scientific meetings: give priority to conferences organised by scientific societies and relegate less relevant meetings to a second place.

Finally, it must be emphasised that the time available to clinicians for research is undoubtedly a pending issue. And it will continue to be so until we manage to change the paradigm that prevails in our institutions, where research is regarded as a mere minor appendage of healthcare activity (and therefore dispensable and incidental), and it is recognised as a essential part of it, also at the organisational level. The Instituto de Salud Carlos III, which manages biomedical research in our country, has acknowledged this need and is attempting to provide some type of remedy through the so-named ''contracts for the intensification of research activity''. However, the chances of successfully applying for one of these grants are limited in view of the stiff competition and they do not solve the problems faced by most clinician researchers. Freeing up part of the day through own funds may be a solution for some researchers.

The importance of a good mentor

Finding a good mentor is not always an easy task. In practice, only a minority of potential mentees have mentors. Moreover, having a mentor is not a guarantee of success in itself: the mentor must be good.[5,22] Obviously, having a mentor means that someone must be generous enough to offer to act as such, but the first step is to open up to this possibility by knowing how to surround yourself with experienced people and showing interest, concern and humility.

The mentor does not need to exercise the same speciality as the mentee, although it does help. Nor do they need to have the same professional interests; but it is logical that if they do, everything will be easier. If the mentee's interest lies essentially in clinical research and, for example, their favourite area is inflammatory bowel disease, then it would make little sense for the mentor to place the focus of the teaching on basic research into liver disease. Ideally, the search for a mentor should run parallel, or rather go hand-in-hand, with the search for a research project, as it would be a good idea to identify both at the same time.[5]

The existence of a personal connection beyond the purely professional aspect, is another ingredient that will go along way towards cementing a successful mentor-mentee relationship. As is only natural, this is largely a question of chance and is beyond the control of both mentor and mentee – each is what they are. But there is no doubt that sharing values about clinical activity, research or even life itself, will be highly conducive to consolidating this personal connection. The existence of a ''chemistry'' between mentor and mentee is important, as it is in any personal relationship.[5]

The benefits of the mentor-mentee relationship have been demonstrated in numerous disciplines, including medicine, nursing and the business world. Specifically in medicine, *mentoring* has been associated with a greater degree of professional satisfaction on the part of the learner, higher levels of promotion and a greater number of published works.[5] Successful researchers, in all likelihood, have had mentors.[23] In this regard, one systematic review concluded that *mentoring* has a major influence on professional development, career guidance, career choice and research productivity, including success in having scientific articles published and in securing research funding.[24]

In a more *senior* phase, we should consider progressively changing our role from mentee to mentor. The mentor must be a reference figure with extensive professional experience and also human values that make them a role model for the mentee. But it should never be forgotten

that *mentoring* requires effort, commitment, responsibility, energy and time, as well as training.[5]

It has been suggested that the mentor should perform the following roles: *teacher* (teaching the mentee from both the teaching and research perspective), *sponsor* (helping the mentee to establish connections with other professionals), *adviser (guiding the mentee throughout their professional career), protector (from the multiple pitfalls that the mentee is bound to encounter along the way), role model (serving as an example to emulate), coach (providing instruction, strategy and motivation) and confidant (providing emotional support)*.[5]

The existence of leaders in the future depends on the identification and promotion of mentees in the present. If we want science to continue to progress, we need leaders who surpass us and are more successful than we have been. The development and maintenance of the mentor-mentee relationship is the most efficient way of guaranteeing the transition from one generation to another, and thus enabling this relationship, so useful and so gratifying in our profession, to survive. It is a great responsibility and a stimulus to know that, in a way, the future of medicine is in our hands.[5]

In summary, *mentoring* is an effective educational tool and is one of the mainstays of medical training and professional development, both academic and investigative. Being a mentor involves playing many roles, the most important one being to act as a sounding board capable of guiding the mentee to find their own answers to problems. The mentor is someone who has already travelled the road (to success) the mentee intends to take and who can help shorten it enormously.

Establishing a network of collaborators and teamwork

People often think of the scientist as an isolated and solitary individual. In the past, most scientific projects and authorships were the responsibility of a single person. For example, Newton was the sole author of the *Principia*, a great work that it would unthinkable could be signed by a single author today. Other great scientists – such as Einstein – published only a small number of works, most of which they signed as sole authors. However, things are very different nowadays, and the idea of a researcher being successful without the backing of a good team is inconceivable.

One competency that should be developed is being able to get access to other colleagues who hold key positions in the scientific community, as this will greatly facilitate opportunities for professional development. A researcher must learn to network within the institutions and must have the ability to identify the most suitable people, expanding their network of contacts. First locally, then nationally, and finally internationally. There are many different ways to progressively break into the world of research and set up a network of collaborators: interacting with colleagues who share the same interests as you, joining scientific societies (national and international), or joining the working groups of these societies (and particularly the ''young'' groups). This may be especially useful for establishing connections with potential collaborators in different research projects. Finally, *networking* does not only include personal contacts, it is also about being skilled in knowing how to source funding, establishing and managing a relationship with scientific societies, as well as the complex and delicate relationship with the pharmaceutical industry.[4,25,26]

The incessant selective pressure on researchers (particularly in Spain) has spawned a symbiotic evolution that has enabled us to survive this environmental pressure. One of the most representative examples of this collaboration is the Centros de Investigación Biomédica en Red [Network of Biomedical Research Centres] (and more specifically the Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas, CIBEREHD [Liver and Digestive Diseases Networking Biomedical Research Centre]), of the Instituto de Salud Carlos III. Indeed, this growing network collaboration is one of the most important strengths of gastroenterology in Spain.[2] For its part, the support provided by scientific societies has also been a key factor in promoting such collaborations. Here, mention should be made of the Asociación Española de Gastroenterología [Spanish Gastroenterology Association] (with its Electronic Research Data Capture Platform, AEG-REDCap) and the Grupo Español de Trabajo en Enfermedad de Crohn y Colitis Ulcerosa [Spanish Working Group on Crohn's Disease and Ulcerative Colitis] (with the national registry of patients with inflammatory bowel disease, ENEIDA). If one conclusion can be drawn from the Spanish experience, it is that collaboration between institutions and networks of researchers is the most profitable strategy for improving the quantity and, more importantly, the quality of research.[2] There is no doubt that teamwork yields great results.[26] Unity is strength, and even more so in research. ''Talent wins games, but teamwork and intelligence win championships.'' (Michael Jordan).

When you consider conducting a multicentre study, you should think that in many cases it takes almost the same effort to organise it with a few centres in your area (for example, your city) as at the national level (with multiple autonomous regions). Obviously, this is not always the case, although sometimes making that extra effort to expand your borders is worth it, as you can obtain faster results and, above all, increased relevance and scientific impact. We should always choose the best collaborators, convincing them that our leadership is a guarantee of success for joint projects. And we should choose the number of collaborators carefully, as some say that ''the success of a research project is generally inversely related to the number of people on whom it depends''.[27] What is certain is that, as almost always, quality, and not quantity, is what matters. The most important thing is to select committed researchers, with guarantees that, for example, they will recruit the number of patients initially agreed upon. It is clear that this commitment is not always easy to honour because it depends on several factors, some of which are beyond our control However, it is important to choose collaborators who are well aware of their capabilities are, since, if they ultimately fail to deliver what was agreed, the viability of the project could be seriously compromised.

With regard to our own team, the work will be much more productive if there is a good atmosphere, cordial and respectful, among the members. However, this will not always suffice; there must also be mutual admiration and understanding, so that everyone is on the same page, with a common goal, coinciding with individual aspirations.

Here, once again, the role of the lead researcher of the group is critical. It is essential to dedicate time to promote *team building*, to ensure that all the team members feel involved and motivated. This is particularly important in basic-clinical (translational) research groups, where coordination between both parties is utterly essential.

In our team, we should surround ourselves with people who are ideally better than us (though some do the opposite, for fear of being overshadowed). Ramón y Cajal argued that a scientist must also act ''on souls'', spending a good part of their time ''forging disciples who will succeed and surpass them''. In this regard, we should help the younger members of our team to progress and stimulate their independence, instead of selfishly nipping their desire to progress in the bud.

The researcher must use their intuition and observe, while being flexible and knowing how to adapt to needs at all times. As in any interpersonal relationship, the relationship between the researcher and the team is not immutable, but is dynamic and can – should – change and mature over time, so that both parties can grow both professionally and as individuals. Moreover, these needs are likely to evolve over time, depending on the changes in the professional trajectory of our team members. For this reason, a team's research activity is better understood as a triad or a continuous interaction between the lead researcher, their team and the environment (to which they must adapt continuously). And this is the reason why the balance between these three elements must be finely adjusted continuously.[28] ''To improve is to change; to be perfect is to change often.'' (Winston Churchill).

Finally, it is crucial to have a person close to you, someone from your own research group with whom you share the same scientific and personal goals, with whom you can share the good and the bad, and find support when your resolve flags. Otherwise, the feeling of ''professional'' loneliness can sometimes be unbearable. ''Shared joy is a double joy; shared sorrow is half a sorrow.'' (Swedish proverb).

Maintain a balance between clinical and research activity

Medical care and research activity are closely related, since medical advances are precisely thanks to research and the publication of its outcomes. Thus, generally speaking, a medical service with a high level of research is a guarantee of good healthcare. Some people have sought to find a false antagonism between research and healthcare, claiming that doctors who publish a lot cannot (or do not have the time to) treat their patients properly. But let's think for a moment about which doctor we personally would turn to if we had a certain disease: we would probably want to be treated by a professional who is most dedicated to that condition and has the greatest experience in it, which on many occasions (although evidently not always) would be the professional who has done most research and published most about the disease. Meanwhile, those professionals who scorn or even criticise research and publishing are putting into practice Miguel de Unamuno's well-known expression ''let them invent [in our case, research]'', forgetting that what they themselves know comes precisely from studies and publications of other authors.[21]

Medicine is a thrilling, albeit complex and stressful profession, with high levels of professional *burnout*.[12] Sometimes it is not easy to maintain your enthusiasm. Alternating in orderly manner between care, research and teaching is the best antidote to disappointment. Research can provide a stimulus for doctors, and make the inevitable negative aspects that all professions have more bearable. Getting up in the morning looking forward to going to the hospital – to look after our patients and to investigate aspects that will help to improve the care we give them – is a priceless privilege. And it is something that many professionals from other disciplines cannot boast of, and for whom boredom is the norm. ''If you think that adventure is dangerous, try routine; it is lethal.'' (Paulo Coelho).

Combine public and private research

Scientific interest and commercial interest do not always go hand in hand.[29] This is why research funded by the pharmaceutical industry and independent research are complementary. Participating in research studies sponsored by the surgical industry to develop new drugs allows you to offer patients the therapeutical alternatives of tomorrow and contribute to the development of new drugs. This type of research also has economic benefits which, if managed properly, will help to sustain your research group. The potential conflicts of interest and the delicate relationship with the pharmaceutical industry goes beyond the scope of this article, but one piece of advice in this regard will suffice: as clinicians and as researchers, we must always maintain, and clearly define, our independence.

On the other hand, it is essential to develop independent clinical research that addresses matters of medical interest and of great relevance to patients, even although it does not generate business profits.[30] This activity closes the circle which begins with the detection of an unmet clinical need in patients, which continues with the design of a suitable research study and ends with the application of its results to these – our – patients. This direct connection between research activity and clinical practice undoubtedly generates an outstanding satisfaction in the doctor-researcher who engages in it. Nevertheless, and unfortunately so, in many cases independent research does not yield a financial profit and, what is even worse, the resources available for independent clinical trials are in extremely short supply.[30] In this way, conducting research studies sponsored by the pharmaceutical industry and independent projects at the same time enables part of the funding obtained from the former to be put towards meeting the costs of the latter. In this regard, our philosophy – that of all our group – is underpinned by the idea that all the funds obtained from projects should be reinvested in research, be it on material or on personnel, which is what makes the group sustainable in the long-term.

Work-life balance

A proper balance between professional and personal life is fundamental in any aspect of our lives. It is important to

set time aside for family and friends, as well as for oneself. This will prevent us from suffering burnout too soon and will also help us to maintain a constant and long-term productive output. Looking after our physical and mental health is also essential. Physical health can be achieved through regular exercise, whereas mental health calls for a regular and disciplined – even obligatory – mental disconnection (for example at weekends or during the holidays). Sometimes that is easier said than done, particularly when you really love what you do. Researchers must decide when to say no to something, not because it is not interesting, but simply because it interferes *too much* (those are the key words) in their personal well-being. Finally, as in any job, the support of family and friends is essential.

Humility, generosity and gratitude

To conclude, it is important to remember that reaching the summit and staying there are equally important and that we must always try to keep our feet on the ground. Humility is a measure of a person's moral and intellectual standing. We must not lose perspective or forget our origins or those who have made it possible for us to get to where we are today. Isaac Newton acknowledged this in his famous words on humility and generosity: ''If I have seen further it is by standing on the shoulders of giants.'' Research should help us to be more humble with every passing day. ''The secret of wisdom, power and knowledge is humility.'' (Ernest Hemingway). And knowledge should make us less proud. ''Science increases our power in proportion as it lowers our pride.'' (Herbert Spencer). Finally, we should be generous to our colleagues, particularly those who are starting out on their professional career. But we should also help our peers as much as possible and sincerely rejoice in their professional successes.

Conclusions

Research is a cornerstone of medical activity and it is evident that the integration of excellent clinical practice and research activity yields the highest quality of care. Regrettably, there are patent shortcomings in the research training of our professionals, partly due to the scant awareness of research and institutional support for it in Spain. For all these reasons, being a researcher, and particularly in our setting, constitutes a veritable challenge. Furthermore, combining research and clinical care activity is also a daunting undertaking that requires great effort, although it can be very rewarding. Research prevents us from falling into routines of care, which is often inevitable; research is the salt and pepper that spices up the already succulent dish of our clinical practice. With the philosophy that most of the qualities needed to develop an excellent research activity depend on attitude, and can be learned, developed and improved, in this manuscript we have shared with the reader a series of recommendations that we consider essential to be a good investigator. We sincerely hope and wish that they will be useful to you in your professional practice.

Conflicts of interest

J.P. Gisbert. Scientific advice, support for research and/or training activities: MSD, Abbvie, Hospira, Pfizer, Kern Pharma, Biogen, Takeda, Janssen, Roche, Sandoz, Celgene, Ferring, Faes Farma, Shire Pharmaceuticals, Dr. Falk Pharma, Tillotts Pharma, Chiesi, Casen Fleet, Gebro Pharma, Otsuka Pharmaceutical, Vifor Pharma, Mayoly, Allergan, Diasorin.

M. Chaparro. Scientific advice, support for research and/or training activities: MSD, Abbvie, Hospira, Pfizer, Takeda, Janssen, Ferring, Shire Pharmaceuticals, Dr. Falk Pharma, Tillotts Pharma.

References

1. Rivas Tovar LA. Las nueve competencias de un investigador. Investig Adm. 2011;108:34–54, núm 2011.
2. McNicholl AG, Gisbert JP. Research to the N-Power: the strengths of networked clinical collaboration in Spain. Am J Gastroenterol. 2017;112:1761–4.
3. Martin KC. Tips for young scientists on the junior faculty/independent investigator job search. Neuron. 2017;93:731–6.
4. Yanos PT, Ziedonis DM. The patient-oriented clinician-researcher: advantages and challenges of being a double agent. Psychiatr Serv. 2006;57:249–53.
5. Gisbert JP. Mentor-mentee relationship in medicine. Gastroenterol Hepatol. 2017;40:48–57.
6. Gisbert JP, Panes J. Scientific publication, bibliometric indicators, and Hirsch's h-index. Gastroenterol Hepatol. 2009;32:140–9.
7. Noble S. Are you a successful researcher? Well, it depends on who's asking. BMJ Support Palliat Care. 2012;2:207–8.
8. Peters S. How to become a successful researcher: tips for early career researchers. Scand J Work Environ Health. 2014;40:432–4.
9. Oxman AD, Sackett DL. Clinician-trialist rounds: 13. Ways to advance your career by saying 'no' – part 1: why to say 'no' (nicely), and saying 'no' to email. Clin Trials. 2012;9:806–8.
10. Lee SJ. Tips for success as an academic clinical investigator. J Clin Oncol. 2013;31:811–3.
11. Provenzale D. A guide for success as a clinical investigator. Gastroenterology. 2012;142:418–21.
12. Cadman EC. The academic physician-investigator: a crisis not to be ignored. Ann Intern Med. 1994;120:401–10.
13. Lewis JD. The pathway to academic success starts during fellowship. Gastrointest Endosc. 2005;61:587–8.
14. Siskind D, Parker S, Loi S, Looi JC, Macfarlane MD, Merry S, et al. How to survive in research: advice for the novice investigator. Australas Psychiatry. 2015;23:22–4.
15. DiMagno EP. 'Good mentorship is invaluable' - an interview with Dr Eugene P. DiMagno. Interview by Martin E. Fernandez-Zapico. Pancreatology. 2005;5:5–7.
16. Steer ML. 'The success of the mentee is the mentor's ultimate reward' An interview with Dr. Michael L. Steer by Martin E. Fernandez-Zapico. Pancreatology. 2006;6:507–9.
17. Bland CJ, Schmitz CC. Characteristics of the successful researcher and implications for faculty development. J Med Educ. 1986;61:22–31.
18. Sackett DL. On the determinants of academic success as a clinician-scientist. Clin Invest Med. 2001;24:94–100.
19. Thoma A, Haines T, Duku E, McKnight L, Goldsmith C. How to become a successful clinical investigator. Clin Plast Surg. 2008;35:305–11.

20. Harvey D, Plummer D, Nielsen I, Adams R, Pain T. Becoming a clinician researcher in allied health. Aust Health Rev. 2016;40:562–9.
21. Gisbert JP, Pique JM. Iniciación a la elaboración y presentación de un manuscrito a una revista biomédica. Programa de Formación Continuada en Gatsroenterología y Hepatología de las Aaociación Española de Gastroenterología (AEG) y la ASociación Española para el estudio del Hígado (AEEH). GH Continuada. 2004;3:49–54, 3, 91–95.
22. Marquez IC, Andrews C, Matthews DC, Clovis JB. From clinician to researcher—a first-hand account. J Can Dent Assoc. 2007;73:247–51.
23. Palepu A, Friedman RH, Barnett RC, Carr PL, Ash AS, Szalacha L, et al. Junior faculty members' mentoring relationships and their professional development in U.S. medical schools. Acad Med. 1998;73:318–23.
24. Sambunjak D, Straus SE, Marusic A. Mentoring in academic medicine: a systematic review. JAMA. 2006;296:1103–15.
25. Korn D. Industry, academia, investigator: managing the relationships. Acad Med. 2002;77:1089–95.
26. Gonzalez Alcaide G, Ramos Rincon JM, Gisbert JP. Scientific collaboration and research areas in Gastroenterologia y Hepatologia and Revista Espanola de Enfermedades Digestivas (2000–2009). Gastroenterol Hepatol. 2010;33:670–80.
27. Goldman L. Blueprint for a research career in general internal medicine. J Gen Intern Med. 1991;6:341–4.
28. Bettmann M. Choosing a research project and a research mentor. Circulation. 2009;119:1832–5.
29. Herfarth HH, Jackson S, Schliebe BG, Martin C, Ivanova A, Anton K, et al. Investigator-initiated IBD trials in the United States: facts, obstacles, and answers. Inflamm Bowel Dis. 2017;23:14–22.
30. Arrieta O, Campillo C, Burgos R, Celis MA, Llata M, Dominguez J, et al. Importancia de la investigacion clinica independiente en la medicina: dificultades y recomendaciones. Gac Med Mex. 2019;155:319–21.