

Interview with Professor Fergus Shanahan

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The Alimentary Pharmabiotic Centre (APC) continues to grow and flourish. How important do you think this is for UCC and research in general?

The APC has grown because it has always operated an inclusive rather than exclusive policy on membership and welcomes any clinician, scientist or clinician-scientist who wishes to collaborate and abide by our rules and principles. UCC needs centres like the APC more than the APC needs UCC if it wishes to promote an environment conducive to learning and innovation.



What are the challenges of being Director of such a large research body? The main challenge is to always ensure centre-like activity, i.e. that the impact is greater than the sum of the parts. An effective 'centre' is much more than a collection of individual investigators. Rather, it is an environment which promotes collaboration and sharing of resources. This requires continual communication and cohesion. Other challenges have been external and outside our control.

What is your vision for the future of the APC?

My vision and ambition for the APC are expressed in detail in our policy documents and website (apc.ucc.ie). Although expanded a little over the years, they are fundamentally unchanged since we launched the Centre. Over the past decade, the Centre has outgrown local bounds and become a national resource with international impact.

How do you think research has changed in Cork?

Part of the mission of the APC from the outset has been to act as an agent of change – to lead by example. Research was always strong in Cork but could be much stronger. I believe that the main threats to research in Cork continue to be: a) insufficient ambition and lack of belief that we can achieve great things on a global stage; and b) misguided notions amongst some of those entrusted with managerial and leadership roles that they should *control* researchers. Research needs managers and leaders to serve, to facilitate and to remove obstacles, not to create them.

Were you interested in research from early on in your career?

Yes. It started with curiosity. In addition, I have always been wary of experts and was slow to believe everything that lecturers told us in medical school. One textbook was never enough for me; I usually sought corroboration from another source before believing it. It sounds like obsessive neurosis to me now. Later, I was told by a colleague that research was an addiction and I think that is a fair description of my relationship with research.

What areas are you most interested in?

I am interested in most things that affect the human condition. I have spent most time investigating aspects of mucosal immunology and intestinal diseases but have also contemplated and written on issues ranging from 'bad language in medicine' to 'who needs doctors?' There aren't enough hours in the day to pursue what I would like to pursue. Of the multitude of projects underway in the APC, there is none that does not excite nor interest me.

What current projects are you involved in?

Host-microbe interactions in the gut remain the focus of research within the APC but the scope of this research is not limited to the gut. Indeed, some disturbance of host-microbe signalling has been identified in a diversity of conditions including metabolic disorders such as obesity and diabetes and various immuno-allergic conditions. For this reason, the gut microbiota has become one of the hottest areas in medicine. We predicted this over a decade ago and have built our research platforms accordingly.

What were the high points (to date!) of your research career? The high point of my career has always been the privilege of working with talented and hard-working people at every level of the research enterprise from students, to staff and senior scientists/clinicians.

What are the negative aspects of research and how do you deal with them? It is not uncommon to spend hundreds of hours planning and writing grant applications only to have the proposal dismissed, often unjustly, or to experience the disappointment of a manuscript rejected unfairly for publication. Patience and perseverance are called for; I am good at the latter and poor at the former!

Collaboration is of increasing importance in research – any advice on how to facilitate and improve collaboration? There is a work of art in the foyer of the bioscience building where the APC is headquartered and it is entitled '*Life Radiant*' by the artist Pamela Hardesty. It reflects the connectedness and fragility of life, but I think of it as also illustrating the fragility of research collaborations in the life sciences. These require careful attention and maintenance. Most importantly, collaboration requires trust. I have built a career on collaboration. It is a fundamental principle upon which the APC was founded almost a decade ago. We use the term hybrid science to refer to investigators who are willing to think beyond the boundaries of traditional disciplines. Some of the most productive discoveries have come from work at the interface of seemingly disparate research avenues. Pursuit of these areas requires shared minds.

Dissemination is also very important. The APC generates a large body of peer-reviewed publications. It has its own newsletter and has an excellent public profile and Outreach schools programmes. How important do you think this is?

A recent external scientific report by scientists from around the globe declared that the APC is better known than UCC! This is because of the impact of our research publications. Publications represent the currency of research and the primary measure of research

output. The APC produces about a hundred articles in peer-reviewed journals each year, many of which have been the subject of editorials and/or made the cover of the journal. Thompson-Reuters recently ranked the APC as #2 in the world in our area of research. However, we also take our role of bringing science to society seriously, and this involves continual education and outreach locally, nationally and internationally. Our intent is not to convert all members of society into scientists, but it is to help society become scientific in its thinking. The targets of our education and outreach programmes range from schoolchildren to politicians and policy makers. To that end, the APC is delivering on its promise to be an agent of change.

Your advice for medical students embarking on their career?

Think of medicine neither as a science nor as an art, think of it as the science *of* the art. Never stray from the scientific method of medicine as a way of thinking, but likewise, try to embrace the humanities as a way of finding inspiration in the ordinary.

In addition, I would list the following snippets of general and specific advice as being important:

General: (a) Loner's don't do well in medicine; (b) Be wary of experts. Foster critical thinking; learn how to learn and learn how to think for yourself; (c) Institutions have no soul, it is people who make a difference; (d) Learn how to cope with uncertainty; (e) Don't become famous before you become good. Too often, one sees young men or women rise to high office without first succeeding in the job to which they were initially appointed. There are no short cuts - you have to pay your dues to the system.

Specific to research: (i) Chose your research mentor with great care; first and foremost your mentor should be a *mench*; (ii) Never chase an observation that does not exist; (iii) The research outcome is only as good as the question being asked. Begin by asking important questions.

What do you consider has been the most important research finding in gastroenterology in recent decades that has had the most clinical impact?

The discovery of *H. pylori* as a cause of peptic ulcer disease and gastric cancer is the most important finding because it provided several lessons of continuing importance. First, it showed that two clinicians could make a huge difference to the welfare of mankind by having an open mind to the causation of a common disease. Second, it showed that epidemiologists missed a transmissible agent as a cause of the disease, probably because of a failure to relate their observations to mechanisms; and third, it showed that biologists missed a transmissible agent under their noses because they failed to think across traditional research boundaries. Finally and most importantly, the discovery showed that the solution to some diseases cannot be found by research focussed exclusively on the host without due regard for the microenvironment.

Do you think ring-fencing of research funding is necessary in the current economic situation and how can this be successfully lobbied for?

If funding research was considered to be economically important during the so-called Celtic tiger, it is even more important now. However, I don't believe in ring-fencing anything unless it is continually of an excellent standard. I believe in funding good people and their ideas. I don't believe in research prioritisation exercises (usually executed by those who have never done meaningful research) and I don't believe in the spurious distinction of basic vs applied science; there is only good science or otherwise. I am not convinced that scientists should lobby for funding. The economic case for funding research is well established. I believe that Irish scientists can best demonstrate the wisdom of investing in their research by continuing to do good research.

2012 – what are your research goals?

More of the same - to persevere regardless of the state of the economy and to continue to pursue that which interests me. Success can be measured in many ways, but for me, it is the simple satisfaction of knowing that I did the best that I could do in the circumstances.