

# Ludwig Institute for Cancer Research

Underpinned by technological advances, cancer research has undergone some exciting developments in recent years. While he is enthusiastic about such progress, Scientific Director of LICR, **Dr Andrew J G Simpson** is keen to point out that much more needs to be done

## Could you give a brief overview of the Ludwig Institute for Cancer Research?

The Ludwig Institute for Cancer Research (LICR) was founded 40 years ago as an international non-profit research institute with a singular focus: improving the understanding and control of cancer. We undertake pioneering basic research and facilitate the translation of promising cancer discoveries into applications for human benefit. This means that we take responsibility for the entire discovery continuum, from the lab to the clinic.

Today we have a network of more than 700 Ludwig scientists and support staff around the world who conduct primarily basic research. They investigate how healthy cells function and what it is that causes cells to malfunction and develop into cancers. But we don't stop there. Discoveries alone aren't enough. We need to take those discoveries and develop them further into new drugs or diagnostic approaches, which we ultimately test in humans. In fact, we are now conducting more than 30 clinical trials globally with compounds derived from Ludwig research. We also work with several biotechnology and pharmaceutical partners to advance products into later stage clinical testing.

LICR is committed to fostering scientific creativity so that we can maintain a pipeline of novel approaches for cancer treatment. The more approaches we have, the better our chances are of preventing cancers from developing in the first place and of improving patient outcomes for those who do develop the disease.

## Given the wide spectrum of cancer research, how does LICR decide to prioritise its funds for maximum impact?

Our priority is to recruit and support highly talented scientists who have a passion to make a difference. Then we give those people the freedom to define their own scientific priorities within their areas of expertise. We support them with long-term funding so they have the time they need and require to fully explore the potential of their work. We want to foster a

collaborative environment where people can share ideas across disciplines. In terms of prioritising cancer types, melanoma, as well as brain and colon cancer have emerged as current areas of interest and expertise.

## Given financial and other competing needs, how do you keep the Institute's research dynamic and creative, and evolving towards the future?

Dynamic, creative research only comes from dynamic and creative people. So first, we strive to identify and engage those people and then we do our best to provide them with an environment where they can flourish.

Part of that environment includes sustained funding, as I mentioned before. Long-term support enables smart people to pursue adventurous work, which can have a big impact. That said, we don't fund our staff enough to be totally self-sufficient – they have to supplement our funds with grants. So while we give them the advantage of core support, they have to use that support to compete successfully against their peers. I think competition is a positive force in research.

Also, we must consider new technology, which is another key to being dynamic and evolving. One example is genomics – gene sequencing. If you don't have the technology, you can't make discoveries. To that end, the Institute commits significant funding to ensure that our scientists have the technological tools they need.

## You were one of the first non-profit institutes to conduct clinical trials using your own investigational agents. Could you comment on how you pursue translational research?

The development of new cancer therapeutic agents that can benefit patients is paramount for the Institute. Translating discoveries and then ultimately demonstrating proof-of-concept in humans is the only way to know whether a new agent has the potential of being developed as a cancer therapeutic. We evaluate clinical agents based on discoveries

## ANALYSIS

made within the Institute for their potential benefit in cancer patients. If we choose to take it forward, we chart a path to advance it as quickly as possible.

In certain instances, we produce the agent and conduct the initial clinical research ourselves. In fact, I'm very proud of the number of antibody and vaccine trials supported by the Institute. Many of these trials are the direct result of collaborative scientific efforts across the organisation.

In other instances, we may license technology to a commercial entity that has the expertise and resources to develop and invest in the concept further. In fact, currently eight commercial phase III trials of technologies emerging from Ludwig are ongoing. In other cases, we have created spin-off companies. To date, we have done this for nine companies in six countries around the world.

Finally, we provide expertise that facilitates the translational research of other research groups. This was the case with one of the commercially available HPV vaccines where our extensive epidemiological data helped facilitate the design and implementation of pivotal clinical trials, which we also led, and resulted in product approval for the company involved.

### **Another differentiating factor of LICR is its strong international footprint. What kind of environment has this multinational approach fostered?**

One of LICR's distinguishing characteristics has been our reach. As an international organisation, we can build strong teams with complementary resources, from scientists focused on basic research all the way through to clinicians, and also experts focused on drug development. To create other synergies within the network, we've developed a collaborative sciences programme focused on three initiatives – brain and colon cancers, and melanoma. The purpose of these initiatives is essentially to ensure that Ludwig scientists around the world are learning from one another, because when learning is shared, the pace of research in each area is faster. To give you an example, the Institute's melanoma metastasis studies and the development of therapeutic cancer vaccines involve Ludwig scientists from Australia, Belgium, Switzerland, the UK and the U.S. In addition, the Institute has partnered with the Conrad N Hilton Foundation in a Cancer Prevention Initiative designed to detect and eliminate aberrant cells before they become life-threatening cancers. Efforts like these encourage cross-fertilisation with scientists who are not part of the Ludwig network, which, we believe, gives us the flexibility to build and evolve the best teams to address specific opportunities in cancer research.

### **Let's talk about the here and now. What are some of the more complex cancer challenges facing cancer scientists today?**

Since LICR was founded – the same year, by the way, that Richard Nixon declared war on cancer by signing the National Cancer Act – we've gained an understanding about what causes the disease and we've made important advances in treatment. But we're still learning, and we have a long road ahead. One feature that sets cancer apart from other diseases is that its molecular underpinning is highly variable. No two tumours are identical. So if you find something that works in one patient,

or one type of tumour, it may have no effect in another. You can't necessarily extrapolate success from one cancer to the next.

To address this challenge as scientists, we need to work to generate an arsenal of drugs and evaluate them in different combinations and on targeted patient populations. It's one of the biggest challenges we face.

### **On a global level, cancer research is being conducted in thousands of labs and organisations across the world. Do you worry that there is a needless duplication of efforts and research? To beat cancer, do we need to overhaul the way it is researched?**

I don't think so. To the extent that there may be duplication, I see it as an asset, not a liability. A redundant system spurs competition. To my earlier point, a system that's competitive is of fundamental importance in research. It's also a good way to ensure there will be checks and balances.

### **The Institute takes responsibility for protecting the intellectual property of its laboratory discoveries, and identifying and characterising your diagnostic and/or therapeutic utilities. We know that cancer research is ultimately meant to improve the lives of cancer sufferers and decrease mortality. But given the cost factor, can cancer research ever be purely altruistic?**

The value of IP has often been a hotly-debated subject. At LICR, we feel that patents are important in ensuring that discoveries made by Institute researchers make their way through testing and that drug developers are willing to invest in these discoveries. I believe that actively managing IP enables organisations such as LICR to be part of the solution of delivering new agents to patients, and making sure that innovative ideas don't go unutilised. At the end of the day, it's not just about patents. Patents alone do not drive innovation. They're a means to an end. They ensure that we have adequate incentives to draw in the expertise of companies, which can bring products to patients.

IP can help to provide a valuable source of income that can be re-invested in research. Through our licensing partnerships, we've generated over \$100 million for LICR, funds that are re-invested in our mission.

**A so-called 'cure for cancer' is certainly one of the most sought-after Holy Grails in medical science. Do you believe we'll win this longstanding battle and find that cure?**

We do have drugs and treatments that could be considered cures right now. Surgery can lead to cure. If you have a non-disseminated tumour, you cure it by removing it. Can cancer be cured with drugs? Well, it's been done in some cases. Look at childhood cancer. A high percentage of child patients are cured by combination drug regimens. What's also happening nowadays is that people are living with cancer as a chronic disease. So while we see an increasing number of patients who are genuinely cured, we're also seeing another population who are living long, fulfilling lives with cancer. Now, we would see a higher percentage of cures if we could identify more tumours before they spread. This would require better screening methods than we currently have. But between surgery, radiation, drugs, and those living relatively normal lives with the disease, there's a lot to be hopeful about. That said, we have a long way to go, and we will need different cures for different cancers. But step by step, we're getting there.

**Are you happy with the pace at which cancer research has progressed overall?**

No, for the very fact that 20,000 people each

day are dying of cancer. We recognise the urgency of the situation, and it's this urgency that keeps us focused on our research and drug development. Our task is to keep focused on our goals, and to put our best efforts into accelerating progress where we can. On that score, I think we've been successful.

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