

# Lewis woman heads lab for cancer research at Chicago University

## Report and pictures from Katie Macleod

The Gordon Centre for Integrative Science sits on 57th street in Hyde Park, home to the prestigious University of Chicago. It is also home to the Macleod Laboratory, set up here in 2001 by Lewis native Kay Macleod.

Sponsored by the National Institutes of Health, the Macleod Lab – part of the University's award-winning Ben May Department for Cancer Research - conducts pioneering cancer research that aims to "understand what's happening at the molecular level."

"I was always been interested in understanding cancer, how it happens, what causes it, how it metastasizes," says Kay, who earned her PHD from Glasgow's Beatson Institute for Cancer Research after completing her undergraduate degree in molecular biology at the University of Edinburgh in the 1980s.

Edinburgh's Department of Molecular Biology was one of the first in the world devoted to a molecular understanding of human disease during a time that saw a huge growth in the study of molecular biology in all areas. "My scientific grounding in Edinburgh was exceptional," remembers Kay, who throughout high school had always expected to enter medicine. She soon realised she was "more into the science", and has never looked back.

Her career has taken her to the Pasteur Institute in France and the world-renowned Massachusetts Institute of Technology, where she completed her post-doctoral training with the pioneering Professor Tyler Jacks, at the MIT Cancer Center, before an opportunity arose in Chicago. Running the Macleod Lab has been the achievement of a long-held ambition for Kay. "To have the opportunity to run my own team and the intellectual freedom to pursue my own ideas on a bigger scale had been my goal since I went to graduate school," she reveals.

"While daunting in terms of taking on the responsibility of managing a large group of people and keeping them motivated and on-task - not to mention raising the money from grants and foundations to support the research - it has been enormously satisfying, and watching younger scientists achieve important scientific results and my team make important contributions to cancer



Associate Professor Kay Macleod

research is very rewarding."

The Macleod Lab is at the forefront of research in the field, looking at drug resistance, tumour metastasis, and the different behaviour of cancerous cells. "We're always looking for something the tumour cell does that normal cells don't, so we can target them specifically" says Kay.

Pointing out an image on a recent lecture slide, she explains that tumour cells have altered metabolism. For example, tumour cells take in more glucose than normal cells – a fact that allows them to be detected in body scans. The main interest of the Macleod Lab is to understand why these cells have altered metabolism, and whether this difference can be exploited to kill them off.

Another area of focus are mechanisms of drug resistance. As Kay points out, "each cancer is very different" and there can be issues with therapy when cancers don't respond to certain treatments. "We're trying to understand how these tumours become resistant to the therapies,"

she says. "Can we target some other pathway?"

In an attempt to answer these questions, and to understand how cancer starts and develops, scientists here use tumour models – genetically modified mice that are predisposed to cancer. By using these tumour models in their research, scientists at the lab can identify 'mutations' in a tumour, and attempt to discover what slows down or speeds up its growth. This is crucial: as Kay explains, metastasis is the most important aspect of cancer to study, because patients usually die of metastasis that has spread throughout the body.

Clinical research is always attempting to find new targets that will attack these cancer cells without harming normal cells, so Kay and her colleagues work closely with clinicians at the University of Chicago hospital, in what is called "translational research" – translating basic scientific research into the medical clinic – "from bench to bedside". "We work with a lot of oncologists," says Kay. "It's a relatively small university, so it's pretty easy to meet up with clinicians and work with them."

It's not an exaggeration – the new hospital building can be seen from the windows of the Macleod Lab. The labs are all open plan, allowing communication and collaboration between the department's students and 12 faculty members, who together cover "very nearly all types of cancer research." Established by Nobel-Prize winner Charles Huggins in 1951, the Ben May Department aims to advance cancer treatment by providing answers to fundamental biological questions.



Gordon Centre for Integrative Science

In 2008 Kay received tenure, an American academic practice that is essentially the provision of a permanent post. "It allows you to do more risky science," she says, adding that tenure means you don't have to worry about what's around the corner, career-wise. "I really enjoy science and thinking through problems. I feel very privileged to have this position, doing a job I really enjoy."

Kay is not the only member of the family making a difference – her mother, Mary Macleod, is closely involved with the Lewis and Harris Breast Cancer Support Group (LHBCSG) as Convener and Trustee. It was Mary who founded the group in 1998, following her own diagnosis and treatment for breast cancer. "I found that there was a huge gap in the provision of help, support and information for people like me recovering from the trauma of a breast cancer journey," she says. "After a lot of research into the need for such support, I established LHBCSG."

As a registered charity, the local group provides support for anyone affected by breast cancer, including patients, family, and friends. From 'Pink' afternoon teas to summer trips to the Southern Isles, the group hosts regular events and outings for its members and the public.

Through Mary, Kay helps keep the group informed of new therapies and drugs, such as the recently approved Perjeta. "I feel very proud of Kay's success and achievements in the field of Molecular Biology and cancer research in particular," Mary says of her daughter. "The fact that I have experienced the trauma of breast cancer, I find Kay's support and interest very rewarding."

## Beauty-care students get chance to pamper old folk

A group of cosmetology students from Lews Castle College stepped out of the classroom in May to give residents of Dun Berisay a pamper session.

The students on the one year course organised the event themselves as part of their coursework aimed at improving communication skills.

As a group of ladies queued up for hand message, nail filing and polishing, college lecturer, Mary Mackay explained that the 'professional development, self and society' unit of the course sought to improve communication and soft skills and took learning out of the classroom.

Previous informal pampering sessions had also been carried out at TalkTalk and MG Alba, but Dun Berisay was the first time they had been carried out in a care setting. The sessions were particularly helpful in building people skills and confidence, and allowing students to meet people outwith the familiar surroundings of the college.

The students agreed their time at the care home had been very worthwhile and they were delighted to have given some 30 ladies an unexpected beauty treatment.



While cancer research makes up the vast majority of her time at the University, Kay spends time teaching too, taking in everything from undergraduate science classes to medical student sessions. Her role also involves engaging in programme work at the Cancer Centre, getting strategically involved in new initiatives, and organising seminars and symposiums.

"I'm constantly being intellectually challenged – science is always smarter than you are," she says of her job. "One thing, unfortunately, is we think we know cancer, and then it changes. It's constantly evolving; tumours are genetically unstable." Kay is quick to emphasise, however, that cancer is no longer a death sentence.

It's a change due in part to scientists in labs like those at the Ben May Department, whose vision is "a future where cancer is eliminated by total cure or perhaps more realistically, managed by chronic treatment that enables a high quality of life." Having focused on breast and ovarian cancer, the Macleod Lab is now branching out with two new projects in pancreatic and skin cancer. They are also planning to collaborate with the Molecular Engineering Department, using their engineering technologies to deliver cancer treatments.

"It's always refreshing intellectually," says Kay. "There is always new stuff: you're at the forefront of science, discovering things people have never seen before. When it all falls into place, it is super exciting."

# Bright future for Gaelic education

The University of the Highlands & Islands (UHI) this month hosted a lecture in Stornoway entitled "Gaelic in Education."

The keynote speakers were Mr Iain Macmillan, Principal of Lews Castle College UHI and Dr Frances Murray, Rector of the Nicolson Institute. The event was chaired by Mr Matthew Maciver, Chair of the UHI Court and retired Chief Executive of the GTC in Scotland.

Mr Maciver introduced the lecture by stating that UHI was hosting the lecture in Stornoway to highlight the Gaelic Medium Higher Education courses which the university offers and that UHI had now been accredited to deliver a new Post Graduate Primary Teaching course in English and Gaelic.

He added that it was fitting that the lecture was taking place in Stornoway where Lews Castle College UHI and the Nicolson Institute are at the heart of the Gaelic community and as such, the Nicolson Institute is in a prime position to be a flagship of Gaelic Medium Education, working closely with the Gaelic dept. of Lews Castle College UHI.

Both Nicolson Institute Rector, Dr Frances Murray, and Comhairle nan Eilean Director of Education, Mr Peter Carpenter, went on to expand on this theme by emphasising the contribution that the Nicolson Institute could make as the

flagship school for Gaelic Medium Education, by being committed to producing its own Gaelic Language Plan. This plan will link up with that of Lews Castle College UHI. She also emphasised the growing importance and profile of Gaelic in the activities of the Nicolson Institute including classroom placements for Gaelic Medium probationer teachers and the participation of staff and pupils in supporting a wide range of Gaelic initiatives in the community.

Following on from these themes, Mr Iain Macmillan, Principal of Lews Castle College emphasised the need to broaden our approach to Gaelic by enhancing our current provision for Gaelic Learners and our Higher Education provision for students. He outlined the range of Gaelic courses available in the islands through Lews Castle College UHI. This included new Primary Teacher Training and degree-level provision for people seeking to develop Gaelic Language skills and share in the history and culture of our islands and our people – through courses delivered both in English and Gaelic.

Mr Macmillan also expanded on Lews Castle College UHI's involvement in the SOILLSE project, which seeks to address the challenges to the strength of Gaelic in our communities and the exciting new developments in the Lews Castle College UHI Music and Art courses in Uist. These

continue to expand and attract many people into our islands not just to expand their musical and artistic knowledge and skills but to immerse themselves in the language and culture of the Gael

For further information on the wide range of Gaelic opportunities available through Lews Castle College UHI please visit [www.lews.uhi.ac.uk](http://www.lews.uhi.ac.uk) or phone Catherine Donald @ 01851-77-0498



### BA Gàidhlig is Leasachadh/ BA Cànan is Cultar na Gàidhlig

The BA Gàidhlig is Leasachadh offers the opportunity to study Gaelic and contemporary Gaeldom, while the BA Cànan is Cultar na Gàidhlig looks mainly at Gaelic, literature and history.

### NC Celtic Studies

This is an exciting one year, full-time course, delivered through the medium of English. It offers the opportunity to study local sites of archaeological interest, genealogy, folklore, Gaelic literature and Scottish history. Students will also be able to study a range of Gaelic language modules suited to their ability.

### An Cùrsa Bogaidh

Lews Castle College is offering a one year further education course for those interested in improving their skills in Gaelic. You will not only be given the opportunity to study the language, but also the literature and cultural heritage of Gaelic Scotland.

For information on any of these courses, please contact Catherine Donald on 01851 770202 or [Catherine.donald@lews.uhi.ac.uk](mailto:Catherine.donald@lews.uhi.ac.uk)

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